# A CO-INTEGRATION APPROACH TO UNDERSTANDING THE IMPACT OF CAPITAL STRUCTURE ON PERFORMANCE OF COMMERCIIAL BANKS' IN NIGERIA

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**Abstract:** This study was carried out to empirically examine impact of capital on profitability of commercial banks in Nigeria employing a co-integration approach. Data set used for analysis in this study was extracted from Central Bank Statistical Bulletin of 2019. This study employed, total debt and total equity as proxies for capital structure while Net profit of commercial banks in Nigeria within the scope of this study was adopted as a measure of the performance of commercial banks in Nigeria. Ex-post facto research design was adopted. Data were analyzed by employing ordinary least square regression (OLS) model on a sample of 14 commercial banks in Nigeria from 2008 through 2019; the study found that capital structure positively and significantly impacted net profit of commercial bank in Nigeria within the period under review. These findings were consistent with trade-off theory of capital structure. Following these findings, the study recommended that since equity accounted for more profit of banks in Nigeria than debt, commercial banks should employ high equity-to-debt ratio in their operations in order to reduce bankruptcy risk and reduce the high gearing associated with banking business and enhance net profit.

**Keywords**: capital structure, profitability, total debt, total equity, returns on equity

## 1.0 INTRODUCTION

### 1.1 Background of the Study:

Finance is so vital to all organization and serves as an instant cause for companies not commencing or progressing. Capital structure serves as one of the important variables considered by firms when considering financial performance. Considering a firms capital structure is imperative not just to boost earnings but also its effect on organization's capability to manage competitive environments. The aim of a firm's capital structure may not be focused on wealth maximization but to safeguard management's interest mostly in firms where control is dictated by directors and shares of the corporation carefully held (Dimitris and Psillaki, 2008).

A firm's capital structure refers to the mix of its financial liabilities. It has long been an important issue from the strategic management standpoint since it is linked with a firm's ability to meet the demands of various stakeholders (Roy and Minfang, 2000). Debt and equity are the two major classes of liabilities, with debt holders and equity holders representing the two types of investors in the firm. Each of these is associated with different levels of risk, benefits, and control. While debt holders exert lower control, they earn a fixed rate of return and protected by contractual obligations with respect to their investment. Equity holders are the residual claimants, bearing most of the risk and have greater control over decisions.

Consequently, firms should be able to improve their market share, finance operations and grow in the long run to improve value added and profits. Firms going through financial distress also have issues with its operational functions, high labour turnover

and the organization objective shifted from key corporate objectives since the current issue is funding debt instruments. Consequently, no leverage depicts that a business forgoing low-cost sources of financing and depending on equity to be exact, a costly source of capital. Capital structure depicts systems in which equity as well as debt is employed for funding the firm's activities to yield optimum returns for the stakeholders to maximize firm's returns given a level of risk (Dada and Ghazali, 2016).

## 1.2 Statement of the Problem

An appropriate capital structure is a critical decision for any business organization. The decision is important not only because of the need to maximize returns to various organizational constituencies, but also because of the impact such a decision have on an organization's ability to deal with its competitive environment. The vital issue confronting managers today is how to choose the mix of debt and equity to achieve optimum capital structure that would minimize the firm's cost of capital and improves return to owners of the business. Financial managers make efforts to ascertain a particular combination that will maximize profitability and the firm's market value. According to Abdul (2012), it is generally believe that the value of a firm is maximized when its cost of capital is minimized. The kind of combination of debt and equity that will minimize the firms cost of capital and hence maximizes the firm's profitability and market value is the optimal capital structure. Unfortunately, financial managers do not have a well-defined formula that for taking decision on optimal capital structure.

A number of theories have been advance to explain the capital structure of firms. However, there is lack of consensus among researchers of financial management about the optimal capital structure. The variations in the various theories further make capital structure decisions crucial. Thus, capital structure decision is very critical, particularly in relation to performance of a firm in terms of profitability and value of the equity.

## 1.3 Objectives of the Study

The main objective of this research is to evaluate the impact of capital structure on profitability of commercial banks in Nigeria. The specific objectives are:

1. To examine the impact of total equity on profitability of commercial banks in Nigeria.
2. To evaluate the effect of total debt on profitability of commercial banks in Nigeria.

## 1.4 Statement of Hypotheses

$HO_1$: Total equity has no significant impact on profitability of commercial banks in Nigeria.

$HO_2$: Total debt has no significant effect on profitability of commercial banks in Nigeria.

## 2.0 REVIEW OF RELATED LITERATURE

### 2.1 Conceptual Review

#### 2.1.1Capital Structure

Capital structure is how a firm would be able to fund its future investments projects via debt, equity or mixed. Capital structure was also defined by Roshan (2009), as a mix of debt and equity capital maintained by a firm.

Capital structure refers to the firm's financing mix mainly debt and equity used to finance the firm. The ability of banks to carry out their stakeholders' needs is tightly related to capital structure. Capital structure, in financial terms, means the way a firm finances its assets through the combination of equity and debt (Saad, 2010). Since the seminal work of Modigliani and Miller (1958), capital structure studies have become an important subject matter in finance theory. How a firm is been finance is of great importance to both the managers of the firm and the providers of capital. This is due to the fact that, a wrong mix of finance employed can affect the performance and survival of the firm.

### 2.2 THEORETICAL REVIEW

This study will be anchored on trade – off theory of capital structure:

#### 2.2.1 Trade-Off Theory

Between 1960s and 1970s, corporate finance scholars (Kraus and Litzenberger, 1973; Miller, 1977; Scot, 1977; Kin, 1978) reignited and modified the argument towards examining the way in which firms manage to balance the bankruptcy cost with the benefit of tax shields derived from leverage. For instance, Miller (1977) hypothesized that the optimal leverage ratio of the firm is determined by the trade-off between current tax shield benefits of debt and higher bankruptcy cost implied by the higher degree of interest tax shield against the cost of financial distress. The work of Scott (1977) and Kin (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 maximize shareholders return. In other words, the theory argues that a firm substitute's debt for equity or equity for debt until the value of the firm is maximized. This theory assumes a positive relationship between a firms leverage and performance.

### 2.3 EMPIRICAL REVIEW

#### 2.3.1 Capital Structure and Firm Performance: A Negative Relationship

Most studies provide evidence of significant negative impact of capital structure on firm's performance. For instance, Soumandi and Hayajneh (2010) investigates 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 growths as proxies for capital structure (independent variables); return on equity and Tobin's Q as measure of firm's performance; Firm size as a control variable, uses multiple regression model represented by ordinary least squares: 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 firm, showed no significant differences between the performances on high and low levered and high low growth firms.

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 hypothesized that financial leverage positively affects firm's activity through disciplining of managers, tax shield and signaling 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.

Akeen, Terer, Kiyanjui and Kayode (2014) while examining the impact of capital structure on performance of 10 randomly selected company quoted on the Nigerian stock Exchange used generalized least squares Regression to analyze 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 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 firm should employ more of equity than debt in financing their business activities. It also suggested the need for firms to establish the point at which the weighted average cost of capital is minimal.

Opoku, Audu and Anarfi (2013) employed a panel data methodology to understand the impact of capital structure on profitability of 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, Tobln's Q and economic valve added (EVA) revealed that 76 percent of the total capital of banks in Ghana is made up of debt with 75 percent consisting both short – term debt and long – term debt consistent with earlier findings that Ghanaian banks were 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 suggest that larger banks tend to exhibit lower profits in line with models that emphasize the negative role of size from scale of inefficiencies. The study therefore recommended that Ghanaian listed banks should make optimal use of resources at their disposal in order to boost profitability.

### 2.3.2 Positive Relationship between Capital Structure and Firm Performance

Yakubu, Baba and Ibrahim (2016) examined capital structure and profitability of commercial banks: Empirical evidence from Nigeria, using ex-post facto research design, applying Auto Regressive Distributed Lag Model on a sample of 13 commercial banks in Nigeria from 2005bthrough 2014. The study found that about 83 per cent of total assets employed by the commercial banks 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 were found to be more prevalent in enhancing the performance of commercial banks during the study period.

Similarly, Adeleke, Ashogbon, Idode and Ogunlowore (2014) examined the influence of capital structure on profitability of Nigerian banks from 2008 to 2012 using expost-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 finding shows that capital structure has a significant positive influence on profitability of Nigerian banks on the basis of this findings, 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 theory.

Similarly, Adeslan and Nwidobie (2015) examined the impact of post-consolidation capital structure on the financial performance of 10 Nigeria banks for the period 2005 through 2012. The study which employed profit before tax as a dependent variable, equity and debt as independents 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.

### 2.3.3 Capital Structure and Firm Performance: A Review of Mixed Findings

Olokoyo (2012) investigated the overall impact of capital structure (Leverage) on performance (return on assets, return on equity and Tobln's Q) of 101 firms listed on the Nigerian stock market from 2003 through 2007. The study, which employed 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 market performance represented by (Tobln's Q). The study establishes that Nigerian firms are either majorly financed by equity or a mix of equity capital and short term debt. The study further shoes that the maturity structure of debts affect the performance of firms significantly and that the size of the firm has a significant positive effect on its performance.

Hasan, Ahsan, Rahaman and Alam (2014) studied 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.

## 3.0 METHODOLOGY

### 3.1 Research Design

According to Zikmund (1994), research design is the master plan specifying the method and procedures for collecting and analyzing the needed information. In this study therefore, a secondary research design or ex-post facto research design was employed. This design was suitable for this study since it dealt with facts and matter that has already taken place and the data were readily available for used.

### 3.2 Population of the Study

The population of this study comprised of an average of 16 commercial banks between 2008 and 2019.

### 3.3 Sampling Technique

The study adopted 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 2008 as well as those that were delisted from the market in between the study period were not included in the study. Thus, a total number of 14 banks were covered.

### 3.4 Sources of Data

The data used in this research are mainly secondary data. This is due to the nature of the study. The library research forms the bedrock for the review of related literature on the subject and also serves to provide theoretical framework that guided the collection and analysis of data. Specifically, data were obtained from the Central Bank of Nigeria (CBN) statistical bulletin 2019 and financial statements of selected commercial banks in Nigeria within the period under study.

### 3.5 Model Specification

To examine the impact of capital structure on profitability of commercial banks in Nigeria over a 12 year period (2008-2019), this study adopts and modifies the empirical model used by Yakubu, Baba and Ibrahim (2016). The model was used to analyze the impact of capital structure on profitability of commercial banks in Nigeria between 2005 and 2014. The model is specified as;

$GP_t = \beta_0 + \beta_1 EF_t + \beta_2 DF_t + \mu_t$ …….. eqn (1)

Where:

*GP*= Bank's performance proxied by Gross profit

*EF*= Equity funds represented by shareholders' funds plus retained earnings and reserves.

*DF*= Debt funds proxied by total deposit liabilities and borrowed funds

$\mu$ = error term

$B_0$ = constant

$B_1$ and $B_2$= Coefficients of their respective variables and

*t* = Time dimension.

The econometric model for this paper differed from the adopted model in the sense that this study adopts auto regressive distributed lag (ARDL) model. Also, net profit was employed as a measure of profitability of commercial bank in Nigeria.

Following both the theoretical and empirical literature earlier reviewed, it is pertinent to submit that the relationship between capital structure and commercial bank's lending in Nigeria can best be mathematically represented as:

$$\Delta NP_t = \beta_0 + \sum_{I=1} \beta_1 \Delta NP_{t-I} + \sum_{I=0} \beta_2 \Delta TE_{t-I} + \sum_{I=0} \beta_3 \Delta TD_{t-I} + w_1 NP_{t-I} + w_2 TE_{t-1} + w_3 TD_{t-1} + \mu t \ldots . eqn$$

Where:

*NP*= Bank's profitability proxied by Net profit

*TE*=Total equity funds represented by shareholders' funds plus retained earnings and reserves

*TD*= Total debt funds proxied by total deposit liabilities and borrowed funds

$\mu$ = error term

*t* = Time dimension

$\Delta$ = Change

$\sum$ = Summation

*p* = Optimal lag

$\beta_0$ = Constant

$\beta_1$ to $\beta_3$ = Coefficients of the short - run variables

$w_1$ to $w_3$ = The coefficient of the long – run component

### 3.6 Data Estimation Technique

Data was analyzed using both quantitative and qualitative approach. In the case of qualitative approach, descriptive statistics was used to compare variables numerically and to ascertain pattern in the data set. According to Saunder, et al, (2007), every statistics to describe data usually summarizes the information in the data by disclosing the average indicators of the variables used in the study. For the quantitative analysis, Autoregressive Distributed Lag (ARDL) otherwise known as bounds test proposed by Pesaran, Shin and Smith (2001) to model equation (1) was used to analyze data. 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:

$$\Delta NP_t = \beta_0 + \sum_{I=1} \beta_1 \Delta NP_{t-I} + \sum_{I=0} \beta_2 \Delta TE_{t-I} + \sum_{I=0} \beta_3 \Delta TD_{t-I} + w_1 NP_{t-I} + w_2 TE_{t-1} + w_3 TD_{t-1} + \mu t \ldots . eqn \ (3)$$

Where:

*NP*= Bank's profitability proxied by Net profit

*TE*=Total equity funds represented by shareholders' funds plus retained earnings and reserves

*TD*= Total debt funds proxied by total deposit liabilities and borrowed funds

$\mu$ = error term

*t* = Time dimension.

$\Delta$ = Change

$\sum$ = Summation
$p$ = Optimal lag
$\beta_0$ = Constant
$\beta_1$ to $\beta_3$ = Coefficients of the short - run variables
$w_1$ to $w_3$ = The coefficient of the long – run component

According to Engle – Granger Representation Theorem, all variables that have long-run relationship must also converge in the short-run (Engle and Granger, 1987).Hence, the general error correction version (short –run version of the ARDL model) of equation (2) becomes:

$\Delta NP_t = \beta_0 + \sum \beta_1 \Delta NP_{t-I} + \sum \beta_2 \Delta TE_{t-I} + \sum \beta_3 \Delta TD_{t-I} + \gamma ECM_{t-I}$….eqn (4)

Where:

*NP*= Bank's profitability proxied by Net profit
*TE*=Total equity funds represented by shareholders' funds plus retained earnings and reserves
*TD*= Total debt funds proxied by total deposit liabilities and borrowed funds
$\mu$ = error term
*t*= Time dimension.
$\Delta$ = Change
$\sum$ = Summation
$p$ = Optimal lag
$\beta_0$ = Constant
$\beta_1$ to $\beta_3$ = Coefficients of the short - run variables
$w_1$ to $w_3$ = The coefficient of the long – run component
ECM = the error correction version of equation

## 4.0 DATA PRESENTATION AND RESULTS

### 4.1 Descriptive Statistic

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

**Table 1: Descriptive Statistics**

| | TOTAL DEBT | TOTAL EQUITY | NET PROFIT |
|---|---|---|---|
| Mean | 4.07E+09 | 4.69E+08 | 4.82E+08 |
| Median | 2.67E+09 | 3.30E+08 | 3.88E+08 |
| Maximum | 1.32E+10 | 2.16E+09 | 1.76E+09 |
| Minimum | 1.74E+08 | 89245113 | 1.11E+08 |
| Std. Dev. | 3.06E+09 | 4.54E+08 | 3.51E+08 |
| Observations | 126 | 126 | 126 |

***Source: Author's analysis using e-view 9 output***

The sampled commercial banks reported average net profit of N48.2 billion, an average total equity of N46.9billion, an average value of total debt of N400.07 billion with the

standard deviations for net profit, total equity and total debt computed at N35.1 billion, N45.4 billion and N300.06 billion respectively. The deviations from the averages of these magnitudes signify that commercial banks do not generate similar net profit and do not also employ similar amount of total equity and total debt in their operations. The results further suggest that about 89.6 per cent of total assets employed by commercial banks in Nigeria were represented by debt, while only about 10.4 per cent was represented by equity, 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 were respectively represented by total debt.

Whilst the minimum net profit of the studied commercial banks stood at N11.1 billion, the maximum is N176 billion. However, when minimum total equity was found to be N8.9 billion, the maximum stood at N216 billion. For total debt, the minimum and maximum were N17.4 billion and N1.32 trillion respectively. The implication of these findings was that most of the studied banks used more of debt than equity.

Total debt employed by commercial banks in Nigeria during the period of study was N 51.3 trillion while total equity employed was N 5.92 trillion. The total capital employed by commercial banks in Nigeria through out the study period stood at N 57.22 trillion. The total number of observation stood at 126.

**4.2 Correlation Matrix**

**Table 2: Correlation Matrix**

| | TOTAL DEBT | TOTAL EQUITY | NET PROFIT |
|---|---|---|---|
| TOTAL DEBT | 1.000000 | | |
| TOTAL EQUITY | 0.387002 | 1.000000 | |
| NET PROFIT | 0.344557 | 0.451826 | 1.000000 |

***Source: Author's analysis using e-view 9 output***

The correlation matrix for the variables is reported in Table 2 above in order to examine the correlation that exists among variables. The results show that there was a positive relationship between all the three variables. However, net profit was positively correlated with total debt at 34.5% and total equity at 45.2%, while total equity is positively correlated with total debt at 38.7%.

The result however, is in agreement with the findings of Adeslan and Nwidobie (2015) and Adeleke, Ashogbon, Idode and Ogunlowore (2014) who reported a positive relationship between capital structure and net profit. This is contrary to the findings of Opoku, Audu and Anarfi (2013) and Akeen, Terer, Kiyanjui and Kayode (2014) who reported a negative relationship between capital structure and net profit.

**4.3 Unit Root Test Results (Summary)**

**Table 3: Unit Root Test Results**

| variables | Levels | | | | | 1st Difference | | | | | Order of Intergration |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ADF Statistics | Critical Values | | | P-Values | ADF Statistics | Critical Values | | | P Values | |
| | | 1% | 5% | 10 % | | | 1% | 5% | 10 % | | |
| NET PROFIT | -3.630376 | -3.4833 | -2.884665 | -2.5791 | 0.0064 | | | | | | I(O) |
| TOTAL DEBT | -2.510718 | -3.4837 | -2.884856 | -2.5792 | 0.1154 | -15.35241 | -3.4837 | -2.884856 | -2.5792 | 0.0000 | I(I) |
| TOTAL EQUITY | -2.458555 | -3.4833 | -2.884665 | -2.5791 | 0.1282 | -11.06303 | -3.4837 | -2.884856 | -2.5792 | 0.0000 | I(I) |

***Source: Author's analysis using e-view 9 output***

The result in table 4.3 above reveals that both total debt and total equity were not stationary at levels but were stationary after they had been differenced once. Net profit was stationary at levels.

**4.4.2 Results of Auto Regressive Distributed Lag Model (ARDLM)**

**Table 4: Auto Regressive Distributed Lag Model (ARDLM)**

| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
|---|---|---|---|---|
| NET PROFIT(-1) | 0.820582 | 0.080565 | 10.18538 | 0.0000 |
| TOTAL DEBT | 0.033786 | 0.008777 | 3.849393 | 0.0002 |
| TOTAL EQUITY | 0.329355 | 0.079414 | 4.147311 | 0.0001 |
| C | 72189561 | 33922466 | 2.128075 | 0.0355 |

| | | | |
|---|---|---|---|
| R-squared | 0.764772 | Mean dependent var | 4.90E+08 |
| Adjusted R-squared | 0.750454 | S.D. dependent var | 3.51E+08 |
| S.E. of regression | 1.75E+08 | Akaike info criterion | 40.86549 |
| Sum squared resid | 3.54E+18 | Schwarz criterion | 41.04840 |
| Log likelihood | -2505.228 | Hannan-Quinn criter. | 40.93979 |

| | | Durbin-Watson |
|---|---|---|
| F-statistic | 53.41242 stat | 2.035727 |
| Prob(F-statistic) | 0.000000 | |

***Source: Author's analysis using e-view 9 output***

N/B t-tabulated=1.96 at df = 121 and 95% confidence level

The selected model was (3, 1, 1) based on Akaike information criterion (AIC) with maximum dependent lag of 4 and adopting a linear model. From the results of the (ARDLM) above, $R^2$ of 77% as well as the adjusted $R^2$ of 75% is an indication that the model is fairly represented. That is the independent variables explained about 77% variations in the dependent variable while the remaining 13% may be explained by variables not included in the model.

There exists a positive and significant relationship in terms of t-stat. and p-value between net profit, total debt and total equity, such that a unit increase in total debt would bring about a 0.033786 increase in net profit, while a unit increase in total equity would bring about a 0.329355 unit increase in net profit. In the same vein, a unit decrease in total debt would bring about a 0.030807 decrease in net profit, also a unit decrease in total equity, would bring about a 0.329355 unit decrease in net profit.

From the result above, the magnitude of the impact of total equity on net profit is relatively higher than that of total debt, supporting the perking-order theory that firms prefer to use more of equity financing than debt financing.

Durbin-Watson statistic of (2.04) suggests that the variables are completely free from autocorrelation.

The F-statistics of 53.4, which measured the joint significance of the parameter estimates, was found statistically significant at 1 per cent level as indicated by the corresponding probability value of 0.000000. This implied that all the variables in the model were jointly and statistically significant in affecting net profit of commercial banks in Nigeria within the period under review.

**4.4.2 Cointegration and Long Run Diagnostic**

**4.4.4.1 Long-Run Coefficients of the Estimated (ARDLM)**

**Table 5: Long-Run Coefficients of the Estimated (ARDLM)**

Long Run Coefficients

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| TOTAL DEBT | 0.009519 | 0.031859 | 0.298798 | 0.7656 |
| TOTAL EQUITY | 0.110654 | 0.209979 | 0.526976 | 0.5992 |
| C | 375327304.07 | 156176283.7 | 2.403229 | 0.0178 |

***Source: Author's analysis using e-view 9 output***

From the estimated long-run coefficients, both total equity and total debt yielded positive but insignificant relationship with net profit. The results imply that net profit of commercial banks in Nigeria are insignificantly positively influenced by total equity and total debt. However, the magnitude of total debt was relatively lower than that of

total equity. By this result, the net profits of commercial banks in Nigeria within the study period were influenced more by total equity than total debt.

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 commercial banks. 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 unit increase in total debt would bring about a 0.033786 increase in net profit, while a unit increase in total equity would bring about a 0.329355 unit increase in net profit. In the same vein, a unit decrease in total debt would bring about a 0.030807 decrease in net profit, also a unit decrease in total equity, would bring about a 0.329355 unit decrease in net profit. The result shows that in the long run, net profit of commercial banks in Nigeria is not a function of their capital structure which is in congruence with 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.

**4.4.3 Cointegrating Form of (ARDLM)**

**Table 6: Cointegrating Form of (ARDLM)**

| Cointegrating Form | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| D(NET PROFIT(-1)) | 0.012919 | 0.078994 | 0.163549 | 0.8704 |
| D(NET PROFIT(-2)) | 0.151832 | 0.077423 | 1.961058 | 0.0523 |
| D(TOTAL DEBT) | 0.033786 | 0.008777 | 3.849393 | 0.0002 |
| D(TOTAL EQUITY) | 0.329355 | 0.079414 | 4.147311 | 0.0001 |
| CointEq(-1) | -0.192338 | 0.056736 | -3.390063 | 0.0010 |

Cointeq = NET PROFIT - (0.0095*TOTAL DEBT + 0.1107*TOTAL EQUITY + 375327304.0780 )

***Source: Author's analysis using e-view 9 output***

Results from Table 4.4.2 shows the short-run dynamics otherwise referred to as the error correction model (ECM) of the estimated ARDL equation. The table demonstrates the relationship among the three variables in the short-run. Unlike in the long-run, both total debt and total equity yielded positive coefficients and statistically significant relationships with net profit. Inference can therefore be drawn that net profit of commercial banks in Nigeria is a function of capital structure components (total debt and total equity) in the short-run unlike in the long-run where both debt and equity were both insignificant.

Whilst in the short-run, a unit increase in total debt would bring about a 0.033786 increase in net profit, while a unit increase in total equity would bring about a 0.329355 unit increase in net profit. In the same vein, a unit decrease in total debt would bring about a 0.030807 decrease in net profit, also a unit decrease in total

equity, would bring about a 0.329355 unit decrease in net profit. Both total debt and total equity in the short-run have statistically significant impact on net profit of commercial banks in Nigeria both in terms of the t-statistic and p-value.

The negative and statistically significant coefficient of the error term further buttresses the co-integration among the variables in the long-run. More importantly, it shows that in case of distortions in capital structure of commercial banks in Nigeria that are capable of affecting net profit, equilibrium can be restored. Given the ECM of -0.192, it behoves that about 19.2 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 1 month, 6 week and 2 days.

### 4.5.1. Test of Research Hypotheses

In this section, the hypotheses earlier stated in chapter one of this study in their null form are tested using t-statistic. The critical or table value are compared with the computed t value to decide whether to reject or accept a hypothesis.

#### 4.5.1.1. Test Results for Hypothesis 1

$HO_1$: Total equity has no significant impact on profitability of commercial banks in Nigeria.

Using ARDL model, data was analysed using e-views (version 9.0) to test the hypothesis. The data for the independent variables were regressed on the data for net profit of commercial banks in Nigeria, all in the Appendix. This was aimed at establishing the impact of capital structure on profitability of commercial banks in Nigeria.

**Decision Rule**

The decision rule is to reject the null hypothesis if calculated t-value is greater than the tabulated t value.

**Decision**

In the short-run, since the value of t-calculated for equity of 4.15 is greater than the t-tabulated value of 1.96, the null hypothesis is rejected at 5% level of significance implying that, total equity component of capital structure has impacted positively and significantly on net profit of commercial banks in Nigeria.

Whilst in the long-run, since the value of t-calculated for equity of 0.53 is lesser than the t-tabulated value of 1.96, the null hypothesis is accepted at 5% level of significance implying that, total equity component of capital structure has no significant impact on net profit of commercial banks in Nigeria.

#### 4.5.1.2. Test Results for Hypothesis 2

$HO_2$: Total debt has no significant effect on profitability of commercial banks in Nigeria.

Using ARDL model, data was analysed using e-views (version 9.0) to test the hypothesis. The data for the independent variables were regressed on the data for net profit of commercial banks in Nigeria, all in the Appendix. This was aimed at establishing the impact of capital structure on profitability of commercial banks in Nigeria.

**Decision Rule**

The decision rule is to reject the null hypothesis if calculated t-value is greater than the tabulated t value.

**Decision**

In the short-run, since the value of t-calculated for debt of 3.85 is greater than the t-tabulated value of 1.96, the null hypothesis is rejected at 5% level of significance implying that, debt component of capital structure has impacted positively and significantly on net profit of commercial banks in Nigeria.

Whilst in the long-run, since the value of t-calculated for debt of 0.30 is lesser than the t-tabulated value of 1.96, the null hypothesis is accepted at 5% level of significance implying that, debt component of capital structure has no significant impact on net profit of commercial banks in Nigeria.

### 4.6 Discussion of Findings

In the previous section, data were presented, analyzed and interpreted. These were done so as to reliably and accurately validate our hypotheses, and measure the correctness of the parameter estimates as well as the suitability and fitness of the estimated equation models, all in an attempt to solving the research problems and achieving the research objectives. The main objective of this research was to evaluate the impact of capital structure on profitability of commercial banks in Nigeria. From our correlation matrix, it was discovered that the relationships between net profit, total debt and total equity were positive. The result of ARDLM showed that in the long-run, total debt and total equity were insignificant, in other words, net profit was not impacted on by capital structure components (total debt and total equity). This finding is in consonance with 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.

But in the short-run, both total debt and total equity were significant and had positive impact on net profit of commercial banks in Nigeria. It was also discovered that total equity had a greater impact on net profit of commercial banks in Nigeria than total debt. However, these findings were consistent with perking order 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 the impact of capital structure on Nigerian commercial banks. They were 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.

## 5.0 CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

Alterations in the capital structure of commercial banks 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 where 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 commercial banks 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 profit, which is the total income generated through the application of the total capital available to banks.

The study applies autoregressive distributed lag model on annual data of 14 commercial banks from 2008 through 2019 and discovered that equity funds is more prevalent in contributing to the performance of commercial banks in the short-run during the study period, but in the long –run, it was found out that capital structure was insignificant in contributing to gross profit of commercial banks in Nigeria. Its therefore pertinent to conclude that in the short-run, capital structure impacts significantly on the financial performance of commercial banks in Nigeria, whilst equity generated a exerted a greater impact on commercial banks financial performance than debt.

### 5.2 Policy Recommendations

As a result of the findings of this study, the study recommends the following policy measures that commercial banks in Nigeria should imbibe and implement in order to maximize gross profit.

(1) Since equity accounted for more profit of banks in Nigeria than debt, commercial banks should employ high equity-to-debt ratio in their operations in order to reduce bankruptcy risk and reduce the high gearing associated with banking business and enhance net profit.

(2) The study also suggests that management and board of directors of commercial banks should from time to time plough back their net profits in to the banking business in form of retained earnings to enhance the generation of more profit since equity yields more impact on net profit than debt.

(3) When faced with shortage funds to be invested in productive projects, or projects with high positive net present value, management of commercial banks in Nigeria should first of all, try to raise such needed funds through equity, either in terms of retained earnings or issuance of new shares or convertible financial securities such as convertible bonds, convertible debentures before exploring outright debt options.

(4) 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 shareholders for continuous investment in the bank. Moderation of risk is likely to enhance the confidence of the shareholders on the security of their funds which will eventually increase their investment through retained earnings thereby allowing banks with more liquidity to pursue profitable ventures.

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