
AN ASSESSMENT OF THE RELATIONSHIP OF CAPITAL ADEQUACY AND FINANCIAL PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

Sani AbdulRahman Bala

Department of Accounting,
Usmanu Danfodiyo University Sokoto, Nigeria
Sonyaxle9@gmail.com 2348034363250

Muhammad, Murtala Ibrahim

Department of Accounting
Usmanu Danfodiyo University Sokoto, Nigeria.
Email: murelu21@gmail.com, Tel: +2348038884035

ABSTRACT

This study employed regression technique on annual secondary data sourced from audited financial statements of the fourteen (14) selected Deposit Money Banks to examine the relationship between capital adequacy and performance of Deposit Money Banks in Nigeria during 2011 through 2018. The study used return on assets (ROA) and returns on equity (ROE) as alternative proxies for performance of Deposit Money Banks and also serve as dependent variables, while capital adequacy ratio was the independent variable. The regression results show that, the estimated coefficient for capital adequacy ratio (CAR) when ROA serves as the dependent variable is 0.148 and positively significant at 10% level of significance. On the other hand, the estimated coefficient for capital adequacy ratio (CAR) when ROE serves as the dependent variable is 0.886 and also positively significant at 1% level of significance. The study suggests that capital adequacy ratio exhibits significant positive relationship with Deposit Money Banks performance proxied alternatively with return on assets (ROA) and return on equity (ROE) within the study period.

KEYWORDS: Capital Adequacy, Financial Performance and Deposit Money Banks

1. INTRODUCTION

Capital adequacy refers to a bank's ability to maintain equity capital sufficient to pay depositors whenever they demand their money and still have enough funds to increase the bank's assets through additional lending (Nwokoji, 2017).

The capital adequacy ratio, also known as capital-to-risk weighted assets ratio (CRAR), is used to protect depositors and promote the stability and efficiency of financial systems. There are two types of capital namely tier-1 capital, which can absorb losses without a bank being required to cease trading and tier-2 capital which can absorb losses in the event of a winding-up and so provides a lesser degree of protection to depositors.

The Central Bank of Nigeria provides that the capital adequacy which is the minimum ratio of capital to total risk-weighted assets shall remain at 10% and at least 50% shall comprise paid-up capital and reserves, while every bank shall maintain a ratio of not less than 1:10 between its adjusted capital funds and total credit net of provisions.

The Bank further classify banks as adequately capitalized, under-capitalized, significantly under-capitalized, critically under-capitalized and technically insolvent. A bank with risk-weighted asset ratio of 10 per cent and above is said to be adequately capitalized, a bank with CAR greater than or equal to 5% but less than the prescribed minimum level of 10% is under-capitalized, a bank with CAR less than 5% but equal to or greater than 2% is significantly under-capitalized, a bank with CAR less than 2% is critically under-capitalized and finally a bank that have negative CAR is said to be technically insolvent.

1.1 Objective of the Paper

Generally, the objective of this paper is to ascertain the relationship of capital adequacy and financial performance of deposit money banks in Nigeria. This objective was cascaded to the following specific objectives:

1. To determine the relationship between capital adequacy and return on assets (ROA) of deposit money banks in Nigeria.
2. To determine the relationship between capital adequacy and return on equity (ROE) of deposit money banks in Nigeria.

1.2 Hypotheses of the Paper

For this paper to achieve its objective of examining the relationship between capital adequacy and performance of Deposit Money Banks in Nigeria, the hypotheses of the study will be formulated in null form for testing as follows:

Ho₁: Capital adequacy had no significant relationship with the return on assets (ROA) of Deposit Money Banks in Nigeria.

Ho₂: Capital adequacy had no significant relationship with the return on equity (ROE) of Deposit Money Banks in Nigeria.

2. LITERATURE REVIEW

This section contains the conceptual review, theoretical framework and review of some empirical studies as it relates to the study.

2.1 Conceptual Review

The research will discuss the contribution of scholars in the relevant concepts related to the study. The concepts include meaning of capital adequacy and Banks' financial performance proxied by return on assets and return on equity. The aim is to give a clearer picture of what these concepts entail in relation to the research work.

2.1.1 Capital Adequacy

Sharpe (1977) defined capital as a difference between assets and deposits and according to him, the higher the ratio of capital to deposit (or the ratio of capital to assets) the safer the deposits. As capital was adequate, deposits were "safe enough".

To Nwanko (1991) bank capital refers to funds attributed to the proprietors as published in the balance sheet. According to Olalekan and Adeyinka (2013), these funds perform a number of functions but the overriding opinion is that the fundamental function is to provide a cushion against losses not covered by current earnings and to protect depositors and other creditors against loss in the event of liquidation.

According to Adewumi (1997), at the outset, capital in the form of issues and paid-up share is money with which the business of banking is started. Overtime, the capital funds of the bank reflect the accumulated (addition or depletion) capital.

Banks obtain their capital through owners' funds, reserves and share capital. The capacity to earn profits by banks depends largely on the prudent combination of assets and liabilities to meet the solvency and liquidity requirements imposed by the monetary and banking policies (Nnanna, 2005).

According to Nwankwo (1991), key element of capital is the only elements common to all countries' banking system. It is wholly visible in the published account of business entities upon which market judgments of capital are made, and it has critical bearing on profit margins and banks' ability to compete.

Yu (1996) defined adequate capital for banks as the level at which they break-even in guaranteeing their deposits with the premium they pay.

To Ejike and Oke (2013), capital adequacy is the amount of equity capital and other securities that banks hold as reserves against risky assets as a hedge against the probability of their failure.

Capital adequacy, according to Kishore (2005) is seen as a quantum of fund, that a financial institution possessed and plan to continuously maintain in order to conduct its business in a prudent manner.

Gardner (1981) stresses that, despite its many roles and diverse functions, it is clear that bank capital is acting as protective cushion against losses precipitated by certain kinds of uncertainties.

The findings made by Dowd (1999) in his study was that, the imposition of minimum capital standards on financial institutions by regulators can be seen as a means of strengthening the safety of deposits and soundness of the banking system. He also suggested that the rationale for government intervention in the financial system is necessary because of the information asymmetry that almost always exists between bank managers and depositors which could produce market failure with devastating consequences. This intervention according to

Olalekan and Adeyinka (2013) would take the form of capital adequacy regulation to force banks to maintain a stronger capital position.

According to Olalekan and Adeyinka (2013), one of the biggest achievements in the banking sector in Nigeria was the upward review of the banks' capital base, that resulted in bigger, stronger and more resilient financial institutions.

2.2 Measures of Banks' Performance covered by the study

As observed by Mathad and Mary (1950), performance is a general term applied to a part or to all the conducts of activities of an organization over a period of time often with reference to past or projected cost efficiency, management responsibility or accountability or the like. Bank performance according to the European Central Bank report of 2010, is the capacity of a bank to generate sustainable profitability.

Performance means different things to different stakeholders in a bank. For example, to depositors, banks' performance connotes long-term ability of the bank to look after their savings, equity holders on the other hand view banks' performance in the angle of profit generation, i.e. on ensuring a future return on their current holding. Four measures of bank performance were covered in this study. These are Return on Assets, Return on Equity, Net Interest Margin and Earnings per Share.

2.2.1 Return on Assets (ROA)

Ghebregiorgis & Atewabrhan (2016) revealed that widespread measure of bank profitability is return on assets (ROA) which indicates how firm management use its assets (or resources) to generate income. It is calculated by dividing a bank's net profit by its total or average assets during the same period. A trend of rising ROA is generally positive provided it is not the result of excessive risk-taking.

2.2.3 Return on Equity (ROE)

According to Ghebregiorgis & Atewabrhan (2016), return on equity (ROE) is another measure of profitability, usually considered in conjunction with return on assets (ROA). It is a ratio of profitability that indicates how many amount of profit a company generates as a percentage of shareholders' equity. A bank's ROE is calculated by dividing net profit by average equity of shareholders. The ROE as a measure of performance is the more relevant for shareholders.

2.3 Theoretical Framework

The study is guided by the Capital Buffer Theory. Generally, the capital buffer is the excess capital a bank holds above the minimum capital required and in capital buffer theory, banks aim at holding more capital than recommended and the theory suggests that the excessive increase in capital than required decreases the risk of the bank and increase the performance of banks due to reducing the rate of lending, which increases the demand for loans. Thus, the study adopted the theory as the theoretical basis for explaining the relationship of capital adequacy and performance of Deposit Money Banks in Nigeria.

2.4 Review of Empirical Studies

This section will give an empirical review of Capital Adequacy and Banks' Financial Performance.

2.4.1 Capital Adequacy and Banks' Financial Performance

Okafor, Ikechukwu and Adebimpe (2010) examined the relationship between capital adequacy and bank's performance in the banking industry in Nigeria. The study selected a sample of twenty (20) banks quoted from the Nigerian Stock Exchange with classification of ten (10) banks as strong banks and the remaining ten (10) as weak banks. The study used secondary data extracted from the Nigerian Stock Exchange Fact Book (2004) and applied the regression model and the ordinary least squares technique. Two regression equations were estimated, one for strong banks and the other for the weak banks. In each category, 40 observations were used for the analysis including the capital, earnings (profit after tax), total assets and liquidity (current assets) for a period of 4 four years covering 2000-2003 financial years. The study conclusion was that for banks' performance to be enhanced, holding adequate capital alone is not enough but rather banks must be ready to identify and assume risky activities commensurate with such capital.

Williams (2011) examined the determinant of capital adequacy in Nigeria during the period 1980 – 2008 within an error correction framework. Co-integration technique revealed that economic indicators such as rate of inflation, real exchange rate, demand deposits, money supply, political instability, return on investment are most robust predictors of the determinants of capital adequacy in Nigeria. After the global credit crunch capital adequacy, being critical for banks, led the study to examine the relationship between bank capital base and macroeconomics variables. This implies that political stability may reduce financial distress and bankruptcy why foreign investment will affect Banks capital in most developing economy in the period of financial crisis. However, the study also establishes that there was a negative relationship between inflation and banks' capital base as inflation erode banks' capital in most developing economy. This simply means that Nigerian government should regulate investment policy why banks regulators should strive to keep inflation rate at a minimum level, if possible below 5% for them to be more efficient so as to be globally competitive.

Ogege, Williams and Emerah (2012) examined the impact of capital adequacy in the banking sub-sector. The study used error correction framework and co-integration techniques to test the relationship between bank capital base and macroeconomics variables covering a period of 1980-2010. Findings of the study showed that there was a negative relationship between inflation and banks' capital base. The study therefore, recommended amongst others that since inflation erodes banks' capital and the need for these banks to be globally competitive, regulators should strive to keep inflation rate at a minimum level, if possible below 5%. The major challenge for the study is that the study does not clearly state in clear terms how the macroeconomic variables were measured.

Abba, Zachariah and Inyang (2013) examined the relationship between capital adequacy and banking risks. The study used risk-weighted asset ratio, deposit ratio and inflation rate as independent variables. Twenty two banks were the population of the study from which twelve banks were selected as sample of the study covering a period of five years from 2007 to 2011. Regression analysis was used to test the hypothesis. Findings of the study revealed that that there was a significant negative relationship between risk and capital adequacy ratio of banks. This entails the fall of capital adequacy whenever the risk level rises. The major gap of this study is that the data collected was for four (4) years only for twelve banks and therefore did not provide good trend evidence to support the findings.

Ezike and Oke (2013) examined the impact of the adoption of the Capital Adequacy Standards on the performance of Nigerian banks. The study used four independent variables

such as loans and advances, shareholders' funds, total assets and customer deposits with two dependent variables of Earnings per share (EPS) and profit after tax. The study involved the use of ordinary least squares (OLS) estimation technique and the results of the analysis showed that capital adequacy standards exert a major influence on bank performance. The study selected only three banks from old generation banks and three banks from new generation banks as a sample of the population. The major gap of this study is the use of only three banks of which the results of the study could not be adequate for generalisation.

Ikpefan (2013) examined the impact of bank capital adequacy ratios, management and performance in the Nigerian commercial bank covering a period of ten years from (1986 - 2006). The study used a sample of fourteen banks from a population of twenty four banks and employed cross sectional and time series of bank data obtained from their annual reports and accounts using ordinary least square regression method. Findings of the study revealed that the overall capital adequacy ratios of the study show that Shareholders Fund/Total Assets (SHF/TA) which measures capital adequacy of banks (risk of default) have negative impact on Return on Assets. In addition, the efficiency of management measured by operating expenses indices was negatively related to return on capital Return on Capital.

Kanu and Isu (2013) examined the impact of Capitalization on Bank Performance in Nigeria from 1970 -2010. The study employed time series of bank data obtained from financial regulatory sources such as CBN and SEC. The formulated models of the study were estimated using ordinary least square regression methods. Findings of the studies revealed a long run positive relationship between capitalization and profitability. The finding of this study was in agreement with the earlier research conducted by Adegaju & Olokoyo (2008) of which the result of Granger Causality indicated a significant but a by-directional relationship between capitalization and profitability. This implied that an increase in capital of commercial banks leads to increase in profitability.. The gap in this study is the use of a model with one independent variable i.e. Profit Before Tax (PBT) and also one dependent variable i.e. Shareholders Fund (SHF). Using additional variables may have made the result more robust.

Ogboi and Unuafe (2013) examined the impact of credit risk management and capital adequacy on banks financial performance in Nigeria, using a time series and cross-sectional data from 2004-2009 obtained from selected banks annual reports and accounts in Nigeria, This was with a view to providing further empirical evidence on how credit risk management strategies and capital requirement variables affect banks' profitability in Nigeria. Panel data model was used to estimate the relationship that exists among loan loss provisions (LLP), loans and advances (LA), non-performing loans (NPL), capital adequacy (CA) and return on asset (ROA). Results showed that sound credit risk management and capital adequacy impacted positively on bank's financial performance with the exception of loans and advances which was found to have a negative impact on banks' profitability in the period under study. The use of Return on Asset (ROA) as the only proxy for banks' financial performance as well as selection of only five banks may affect the validity of the results, hence more banks should have been selected and that more proxies for financial performance should have been used.

Olalekan and Adeyinka (2013) examined the effect of capital adequacy on profitability of deposit- taking banks in Nigeria. To that end, they assessed the effect of capital adequacy of both foreign and domestic banks in Nigeria on their profitability. Primary data were collected through questionnaires involving a sample of 518 distributed to staff of banks with a response rate of 76%. Also published financial statement of banks were used from 2006 - 2010. The findings for the primary data analysis revealed a non-significant relationship but the

secondary data analysis showed a positive and significant relationship between capital adequacy and profitability of bank. The major gap identified in the study is that neither the primary nor the secondary data revealed clearly the independent and dependent variables. Furthermore, the study did not also clearly show the selected population and how it was arrived.

Ejoh and Iwara (2014) examined the impact of capital adequacy on Deposit Money Banks' profitability in Nigeria, taking a case study of five selected banks. The 30 year data of 1981 to 2011 for the study were obtained from secondary sources including the annual reports and financial statements of the selected banks and Central Bank of Nigeria (CBN) statistical bulletin. The study adopted the Engle and Granger two steps procedure in co-integration and revealed that capital adequacy play an important role in explaining banks Returns on Assets (ROA) which is a measure of banks' profitability. This finding suggested that banks with more equity capital are perceived to have more safety and such advantage can be translated into higher profitability. The higher the capital ratio, the more profitable a bank will be. The selection of only five banks as sample of the population may impedes the applicability of the results to other banks in addition to using only Return on Assets (ROA) as a measure of banks' profitability.

Agbeja, Adelakun and Olufemi (2015) examined whether or not capital adequacy ratio affects bank profitability and also analyses the effect of loans and advances on bank profitability as well as the impact of capital adequacy ratio on banks' exposure to credit risk. The study utilized secondary data covering five years financial statement taking case studies of five selected commercial banks. The study found a positive and significant relationship between capital adequacy and bank's profitability. The data collected was for five years from the five selected banks and therefore may not provide good evidence to generalise the findings.

Akani and Lucky (2015) examined the econometrics analysis of capital adequacy ratios and the impact on the profitability of Commercial Banks in Nigeria from 1980 – 2013. Time series data were sourced from Stock Exchange Fact Book and financial statements of quoted commercial banks and the Johansen co-integration techniques in vector error correction model setting (VECM) as well as the granger causality test were employed. The study has Return on Asset (ROA), Return on Investment (ROI) and Return on Equity (ROE) as the dependent variables and the independent variables are Adjusted Capital to Risk Asset Ratio (ACRR), Capital to Deposit Ratio (CTD), Capital to Net Loans and Advances Ratio (CNLAR), Capital to Risk Asset Ratio (CRA) and Capital to Total Asset Ratio (CTAR). The empirical result demonstrated vividly in the models that there was a positive long run dynamic and significant relationship between return on asset and capital to risk asset ratio and capital to deposit ratio while others are negatively correlated. The findings also revealed that there was bi-directional causality running from ROA to ACRR and ROA to CNLAR. It is commendable that the study was able to use the major proxies for the dependent and independent variables, the outcome of the research would have been more informative if control variables were considered.

Eyo and Offiong (2015) examined the effect of Capital Adequacy on the Performance of Access Bank Plc covering a period of 1999 – 2012. However, the influence of capital adequacy on the bank's profitability was evaluated. The study used mainly secondary data sourced from annual report of Access Bank Plc. for the years under scope, CBN Statistical Bulletin and journal articles that were analysed using the desk survey. Multiple regression method was used and the empirical analysis indicates that there is no significant relationship between core capital and the profitability of Access Bank Plc and also that there was a

significant relationship between supplementary capital and the profitability of Access Bank Plc. The study recommended, among others that provision of adequate capital regulation; provision of infrastructural base to support banking services and stability of the institution must be of imperative to the central monetary authority. The study used a case study and hence specific to that Access Bank alone and it is not conclusive that the results could apply to other Deposit Money Banks.

Apere (2016) examined the relationship between Capital Adequacy of banks and Return on Assets of banks in Nigeria over a period of 2001 to 2014 by using secondary data obtained from (CBN) statistical bulletin (2014) and World Bank (2015). Relevant econometric techniques were adopted in analysing the data for the study and the Descriptive Statistics Test was conducted alongside Correlation Test to ascertain the strength of their relationship and the study further employ the Johansen Co-integration test and the Error Correction Model (ECM). The study revealed that there was a long-run significant positive relationship between capital adequacy and return on assets of banks in Nigeria over the period under review. The only identified gap of this study is that it does not consider control variables which could have led to a more robust result.

Aruwa and Naburgi (2016) examined the impact of capital adequacy on the financial performance in term of profitability and saving mobilization of quoted banks in Nigeria using a time series data of 1997-2011 from the Nigerian Deposits Insurance Corporation (NDIC). Whereas saving mobilization was proxied by customers' deposits to total liabilities, profitability on the other hand was proxied by profit after tax to total assets and capital adequacy was proxied by capital to risk weighted assets. Ordinary least square method of regression was used and finding of the study was that there was insignificant impact of capital adequacy on financial performance and hence recommended pragmatic changes in bank regulatory focus, improved corporate governance, personnel training and stable polity for ensuring sound financial health for the Nigerian banking sector. The use of ROA as the only proxy for banks' performance may not be adequate.

Tochukwu (2016) examined capital adequacy-risk management outcomes of the banks during the 2009-2015 periods. A sample of twelve Banks was used on pooled regression analysis from the extracted data on capital adequacy ratio, risk weighted assets ratio, deposit asset ratio, and non-performing loans ratio as variables of the study from published financial statements of the banks. Pooled least squares (PLS) techniques were used to obtain estimates of parameters of the model, as well as relevant inferential statistics. Findings of the study revealed that risk management variables exerted differing degrees of negative effects on capital adequacy. Only risk-weighted asset ratio singularly exerted statistically significant at the 5% level. The explanatory variables jointly exerted statistically significant effect on, and were strong in explaining variations in the explained variable. The study concluded that degree of negative effects of variables differed, and recommended objective-oriented deposit drive by the banks to attract more deposits. Loans should be adequately secured to reduce the incidence of non-performing loans to dampen the negative effects of risk management and thus, enhance capital adequacy of the banks.

Umoru and Osemwegie (2016) examined the significance of the capital adequacy ratio on financial deeds of Nigerian banks. The study applied GLS estimator technique on the pooled panel model for the period of nine years spanning 2007 to 2015. Finding of the study revealed that capital adequacy had a significant impact in enhancing the financial deeds of Nigerian banks, even though, the impact of the estimated capital adequacy was below 30%. Based on these findings, the study suggested a constant reassessment of the least amount of capital required of banks by the Central Bank of Nigeria. The study covered only eight banks

as the selected samples from the population and hence, the results could have been more informative if more banks were covered.

Abdul (2017) examined the impact of capital adequacy on banks' performance in Nigeria. Data were collected on total assets, owners' funds, customers' deposits and loans and advances as variables of the study, using the cross-panel methodology from nine deposit money banks with significant foreign operations. The results of the ordinary least square (OLS) regression showed that 76 per cent (R²) of the variations in profit after tax (PAT) were caused by independent variables. The study further showed that a unit change in Total Assets (TA), Loans and Advances (LA), Customer Deposits (CD) and Owners' Capital (OC) led to 4.1, 1.6, 3.7 and 1.7 per cent change in Profit after Tax (PAT) respectively. The study recommended that the banks' regulators should not only focus on capital adequacy but also on supervisory review and market discipline to maintain banks' financial strength and stability in Nigeria.

Amahalu, Okoye, Nweze, Chinyere, & Christian (2017) examined the effect of Capital Adequacy on Financial Performance with a focus on selected quoted Deposit Money Banks in Nigeria from 2010-2015. The study made use of secondary data obtained from fact books, annual reports and account of the Deposit Money Banks under study. The study applied statistical analysis using Pearson Coefficient of Correlation, Multiple Regression Analysis, Variance Inflation Factors, Multicollinearity, Heteroskedasticity test and Hausman test. Their result revealed that there was a positive and significant relationship between Capital Adequacy and Financial Performance. It was also empirically verified that Capital Adequacy had a statistically significant effect on Financial Performance on Deposit Money Banks at 5% level of significance. Although, the study used Return on Assets (ROA), Return on Equity (ROE) and Return on Capital Employed (ROCE) as variables for banks' performance with no control variables, the results may have been different if control variables such as inflation, interest rate etc. had been considered.

Iheanyi and Sotonye (2017) examined the performance of banks in Nigeria using CAMEL rating. The study covered a period of (19) years (1996-2014) and used secondary data from NDIC annual reports and accounts with twenty one (21) deposit money banks as the population of the study. The data collected were analysed through ordinary least square. While the results of the showed that capital adequacy, management efficiency, earnings and liquidity have no significant impact on the profitability of the banks, assets quality on the other hand had a negative impact on that profit of the bank. The study recommended an expanded capital generation by banks through sales of shares, debt, investment, retain earning etc. to boast their profit and should also improve their quality of assets to ensure performing assets outweigh the non-performing ones.

Kipruto, Wepukhulu and Osodo (2017) examined how capital adequacy ratio influences financial performance of commercial banks in Kenya. The study was purely quantitative research of which correlation research design and descriptive research designs were used covering 14 commercial banks in Kenya. The four year data covering 2013 to 2016 collected was analysed using descriptive and inferential statistics and research hypotheses were tested using multiple regression analysis. Findings of the study showed that capital adequacy ratio had significant strong positive relationship ($p < 0.05$) with financial performance of the selected banks. The study recommended that commercial banks need to seek cheap deposits to increase their operating capital and that the Central Bank of Kenya needs to needs to increase their supervision role of ensuring that commercial banks core capital is healthy to support their businesses.

Udom & Eze (2018) examined the effect of capital adequacy requirements on the performance of commercial banks in Nigeria. The study employed secondary data by using Ordinary Least Squares (OLS) regression method in establishing the relationship between the study used Adjusted Shareholders Fund (ASF), Capital to Risk Weighted Assets (CRWA), and Total Qualifying Capital (TQC) as the proxies for Capital Adequacy and the Returns on Asset (ROA) which was the proxy for banks' performance. The results revealed a significant relationship between capital adequacy and financial performance of commercial banks in Nigeria. Based on the findings, the study recommended for improvement in the quality of assets portfolio and deposit liabilities in order to improve on the achievement of corporate objectives of these banks.

3. RESEARCH METHODOLOGY

The study is to examine the relationship between Capital Adequacy and the performance of Deposit Money Banks proxied by Return on Assets and Return on Equity of the selected Deposit Money Banks in Nigeria. The study used Deposit Money Banks' empirical data from their published accounts. The data were analysed and inferences drawn about the relationships between independent variable being the capital adequacy and dependent variables (ROA and ROE) covering eight years from 2011 to 2018 using 2011 as a base year due to the review of prudential guidelines in 2010 where provision of the capital adequacy by banks was highly emphasised and the year 2018 is set as the upper limit because it was the year in which the current annual reports of all the selected banks were readily available. The choice of ROA and ROE as variables for banks' performance is not far-fetched being not only the most common variables for banks' performance but also are the two of the most important measures for evaluating how effectively a company's management team is doing its job of managing the capital entrusted to it. While return on assets (ROA) assess how assets are being managed, return on equity (ROE) measures how much net profit can be generated with the money invested by the shareholders.

Moreover, the choice of these variables is in agreement with the previous studies of Abba Gabriel (2012), Barasa (2012), Bidali (2012), Njeulu (2013), Omondi (2014), Kahuthu (2016), Mutinda (2016), Mohamed, Mutegi & Muriuki (2017) and Ndolo (2017).

The study used purposive sampling technique to select only Deposit Money Banks that were listed in Nigeria Stock Exchange and have availability of required data as well as maintaining their operational status from 2011 to 2018. Hence, all Deposit Money Banks that were delisted from NSE within the study period as well as not having complete data required were excluded. These criteria were considered appropriate because banks listed on Nigeria Stock Exchange are expected by law, to submit their annual report and accounts to the Exchange. After adjustment of the population, the study arrived at 14 Deposit Money Banks that met the set criteria and these banks are: Access Bank, Diamond Bank, Ecobank, First City Monument Bank, Fidelity Bank, First Bank, Guaranty Trust Bank, Stanbic IBTC, Sterling Bank, United Bank for Africa, Union Bank, Unity Bank, Wema Bank and Zenith Bank.

Model Specification

The models are set to depict the relationship between capital adequacy and performance of Deposit Money Banks in Nigeria. The dependent variables are return on assets (ROA) and return on equity (ROE), while capital adequacy is the independent variable. The following models were developed as specified below:

Model Specification

$$ROA_{i,t} = \beta_0 + \beta_1 CAR_{i,t} + \varepsilon_{i,t} \dots\dots\dots(1)$$

$$ROE_{i,t} = \beta_0 + \beta_1 CAR_{i,t} + \varepsilon_{i,t} \dots\dots\dots(2)$$

Where:

- Return on Assets (ROA) = Profit after tax / Total assets
- Return on Equity (ROE) = Net Income / Shareholder’s Fund
- Capital Adequacy Ratio (CAR) = Total Capital/Total Assets * 100

3. 2 Method of Data Analysis

This study employed regression technique and the choice lies in the fact that it is a method that allows an examination of the relationship between two or more variables of interest and the paper is to determine the relationship between capital adequacy and performance variables such as return on assets (ROA) and return on equity (ROE) of Deposit Money Banks in Nigeria.

4. DATA PRESENTATION AND ANALYSIS

In order to determine the relationship between capital adequacy and return on assets (ROA) as well as return on equity (ROE) of Deposit Money Banks in Nigeria, this study employed regression technique on secondary annual data. The regression analyses are contained in Table1 & 2 below:

Table 1: Summary of Regression Result of ROA and CAR

Dependent Variables: Return on Assets (ROA)		
Variables	Coefficients	P - value
Constant	-0.383 (1.512)	0.801
CAR	0.148 (0.076)	0.053*
R²	F – cal.	F – sign.
0.036	3.819	0.053*

Source: SPSS Output & Note: () indicates significant at 10% level.*

Table 1 presents summary of regression result when bank performance (ROA) serves as the dependent variable, while prudential guidelines (capital adequacy ratio) stands as the independent variable. From the result, the coefficient of determination (R²) of 0.036 shows that approximately 4% variation in Deposit Money Banks performance (ROA) is explained by the variation in prudential guidelines (capital adequacy ratio). The estimated F – calculated 3.819 is significant at 1% level, and thereby indicates that the model is both adequate and significant. The estimated coefficient for constant is -0.383, but not significant.

This shows that even without variation in prudential guidelines (capital adequacy ratio), the Deposit Money Banks performance would have reduced by 0.383 but not significant. More so, the estimated coefficient for capital adequacy ratio (CAR) is 0.148, and it is positively significant at 10% level of significance. This shows that a unit change in capital adequacy ratio will change Deposit Money Banks performance by 0.148 significantly. In addition, this finding indicates a significant positive relationship between capital adequacy ratio and Deposit Money Banks performance (ROA) in Nigeria.

Table 2: Summary of Regression Result ROE and CAR

Dependent Variables: Return on Equity (ROE)		
Variables	Coefficients	P - value
Constant	-4.152 (3.259)	0.206
CAR	0.886 (0.164)	0.000***
R²	F – cal.	F – sign.
0.223	29.326	0.000***

*Source: SPSS Output & Note: (***) indicates significant at 1% level.*

Table 2 presents summary of regression result when Deposit Money Banks performance (ROE) serves as the dependent variable, while prudential guidelines (capital adequacy ratio) stands as the independent variable. From the result, the coefficient of determination (R^2) of 0.223 shows that approximately 22% variation in Deposit Money Banks performance (ROA) is explained by the variation in prudential guidelines (capital adequacy ratio). The estimated F – calculated 29.326 is significant at 1% level, and thereby indicates that the model is both adequate and significant. The estimated coefficient for constant is -4.152, but not significant. This shows that even without variation in prudential guidelines (capital adequacy ratio), the Deposit Money Banks performance would have reduced by 4.152 but not significant. More so, the estimated coefficient for capital adequacy ratio (CAR) is 0.886, and it is positively significant at 1% level of significance. This shows that a unit change in capital adequacy ratio will change Deposit Money Banks performance by 0.886 significantly. In addition, this finding indicates a significant positive relationship between capital adequacy ratio and Deposit Money Banks performance (ROE) in Nigeria.

The findings suggest that capital adequacy ratio exhibits significant positive relationship with Deposit Money Banks performance proxied alternatively with return on assets (ROA) and return on equity (ROE) within the study period.

5. SUMMARY OF FINDINGS

The regression results show that, the estimated coefficient for capital adequacy ratio (CAR) when ROA serves as the dependent variable is 0.148 and positively significant at 10% level of significance. This shows that a unit change in capital adequacy ratio will change Deposit Money Banks performance by 0.148 significantly. In addition, this finding indicates a significant positive relationship between capital adequacy ratio and Deposit Money Banks performance (ROA) in Nigeria. The estimated F – calculated 29.326 is significant at 1%

level, and thereby indicates that the model is both adequate and significant. The estimated coefficient for constant is -4.152, but not significant. This shows that even without variation in prudential guidelines (capital adequacy ratio), the Deposit Money Banks performance would have reduced by 4.152 but not significant. More so, the estimated coefficient for capital adequacy ratio (CAR) when ROE serves as the dependent variable is 0.886 and positively significant at 1% level of significance. This shows that a unit change in capital adequacy ratio will change Deposit Money Banks performance by 0.886 significantly. In addition, this finding indicates a significant positive relationship between capital adequacy ratio and Deposit Money Banks performance (ROE) in Nigeria.

6. CONCLUSION AND RECOMMENDATIONS

This study employed regression technique on secondary annual data sourced from audited financial statements of the selected Deposit Money Banks to determine the relationship between capital adequacy and return on assets (ROA) and return on equity (ROE) of Deposit Money Banks in Nigeria. The study data were sourced from fourteen (14) Deposit Money Banks that are listed in the Nigeria Stock Exchange and maintained their operational status from 2011 to 2018. The Deposit Money Banks that met these criteria are Access Bank, Diamond Bank, Ecobank, First City Monument Bank, Fidelity Bank, First Bank, Guaranty Trust Bank, Stanbic IBTC, Skye Bank, Sterling Bank, United Bank for Africa, Union Bank, Unity Bank, Wema Bank and Zenith Bank. In conclusion, the capital adequacy ratio exhibit significant positive relationship with Deposit Money Banks performance proxied alternatively with return on assets (ROA) and return on equity (ROE) within the study period. The positive effect indicates that having a standard and adequate capital could improve firm performance as evidenced by its ability to preserve the firm's capital position even during period of uncertainties. The positive and significant relationship is an indication that banks with more equity capital are believed to be safer and could in turn be translated to higher profitability. On the basis of these findings, the study is of the view that Deposit Money Banks need to enhance their capital adequacy position for the overall safety and soundness of the banking sector. So also the regulatory authorities particularly the Central Bank of Nigeria need to improve on their supervisory role to ensure the compliance of Deposit Money Banks in the capital adequacy requirements

REFERENCES

- Abba, G. O., Zachariah, P., & Inyang, E. E. (2013). Capital Adequacy Ratio and Banking Risks in the Nigeria Money Deposit Banks. *Research Journal of Finance and Accounting*, 4(17), 17-25.
- Abdul, J.M (2017) Impact of Capital Adequacy on the Performance of Nigerian Banks using the Basel Accord Framework. *East Africa Research Papers in Business, Entrepreneurship and Management*.
- Adegbaju, A. A & Olokoyo, F.O (2008) Recapitalisation and Banks' Performance, A Case of Nigeria Banks: *African Economic and Business Review*, Vol. 6 No.1, Spring
- Agbeja, O., Adelakun, O.J. and Olufemi, F. I. (2015) Capital Adequacy Ratio and Bank Profitability in Nigeria: A Linear Approach. *International Journal of Novel Research in Marketing Management and Economics Vol. 2, Issue 3, pp: (91-99)*. Available at: www.noveltyjournals.com
- Akani, H.W and Lucky, L.A (2015) Econometrics Analysis of Capital Adequacy Ratios and the Impact on Profitability of Commercial Banks in Nigeria. *IOSR Journal of Economics and Finance (IOSR-JEF) e-ISSN: 2321-5933, p-ISSN: 2321-5925. Volume 6, Issue 6. Ver. II, PP 11-24*. www.iosrjournals.org
- Amahalu, N., Okoye, E. I., Nweze, C., Chinyere, O., & Christian, O. (2017, July). Effect of Capital Adequacy on Financial Performance of Quoted Deposit Money Banks in Nigeria. In Chapter 57 in the proceedings of the 2017 International Conference on African Entrepreneurship and Innovation for Sustainable Development (AEISD).
- Apere, T.O. (2016). Return on Assets and Capital Adequacy of Banks in Nigeria. *Advances in Social Sciences Research Journal*, 3(12)139-149
- Aruwa, S.A.S and Naburigi, M.M (2016) Impact of Capital Adequacy on the Financial Performance of Quoted Deposit Money Banks in Nigeria
- Ejoh, N.O and Iwara U.U (2014) The Impact of Capital Adequacy on Deposit Money Banks' Profitability in Nigeria. *Research Journal of Finance and Accounting* www.iiste.org ISSN 2222-1697 (Paper) ISSN 2222-2847 (Online) Vol.5, No.12
- Eyo I. E and Offiong, A. I (2015) Effect of Capital Adequacy on the Performance of Access Bank Plc: (1999 – 2012). *International Journal of Trade, Economics and Finance*, Vol. 6, No. 6, December 2015
- Ezike, J. E., & Oke, M. O. (2013). Capital Adequacy Standards, Basel II Accord and Bank Performance: The Nigerian experience (a case study of selected banks in Nigeria). *Asian economic and financial review*, 3(2), 146-159
- Iheanyi, I. H. and Sotonye, I. (2017) Assessing the performance of Nigeria's Bank through the Camel Model. *Journal of Accounting and Financial Management* 3 (1) pp. 14-22 ISSN 2504-8856
- Ikpefan O.A. (2013) Capital adequacy, management and performance in the Nigerian commercial bank (1986 - 2006). *African Journal of Business Management Vol. 7(30)*, pp. 2938-2950, 10.5897/AJBM09.258 ISSN 1993-8233 © 2013 Academic Journals <http://www.academicjournals.org/AJBM>
- Kanu, C. and Isu, H.O (2013) The Impact of Capitalization on Bank Performance in Nigeria 1970 – 2010: An Assessment. *International Review of Management and Business Research Vol. 2 Issue.3* www.irnbrjournal.com
- Kipruto, J.J, Wepukhulu, J.M and Osodo, O.P (2017) The influence of Capital Adequacy Ratio on the Financial Performance of Second-Tier commercial Banks in Kenya. *International Journal of Business and Management Review Vol.5, No.10, pp.13-23*.

*Published by European Centre for Research Training and Development UK
(www.eajournals.org) ISSN: 2052-6393(Print), ISSN: 2052-6407(Online)*

- Nwokoji, C (2017) Why Nigerian banks have weak capital adequacy. <https://tribuneonlineng.com/nigerian-banks-weak-capital-adequacy-fitch/>
- Nwokoji, C (2017) Why Nigerian banks have weak capital adequacy —Fitch Money Market
- Ogboi C. and Onuafe, O.K (2013) Impact of Credit Risk Management and Capital Adequacy on the Financial Performance of Commercial Banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking (JEIEFB) An Online International Monthly Journal (ISSN: 2306-367X) Volume:2 No.3*
- Ogege, S., Williams, H.T and Emerah A. (2012) An Empirical Analysis of Capital Adequacy in the Banking Sub-Sector of the Nigeria Economy. *International Journal of Economics and Finance Vol. 4, No. 5*
- Okafor, C., Ikechukwu, K. and Adebimpe, U. (2010) The Effect of Capital Adequacy on Banks' Performance: Evidence from Nigeria. *Journal of Business Research Vol 4, No 1-2*
- Olalekan A. and Adeyinka S. (2013) Capital Adequacy and Banks' Profitability: An Empirical Evidence from Nigeria. *American International Journal of Contemporary Research Vol. 3 No. 10; October 2013*
- Tochukwu, O. R. (2016). Capital Adequacy and Risk Management: A Study of the Nigerian Banking Sector. *International Journal of Innovative Science, Engineering & Technology*, Vol. 3 Issue 7, July 2016 ISSN (Online) 2348 – 7968. Available at: www.ijiset.com
- Udom, I.S and Eze, O, R (2018) Effect of Capital Adequacy Requirements on the Profitability of Commercial Banks in Nigeria. *International Research Journal of Finance and Economics ISSN 1450-2887 Issue 165*. <http://www.internationalresearchjournaloffinanceandeconomics.com>
- Umoru D and Osemwegie J.O (2016) Capital Adequacy and Financial Performance of Banks in Nigeria: Empirical Evidence Based on the Fgls Estimator. *European Scientific Journal vol.12, No.25 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431*
- Williams, H.T (2011) Determinants of capital adequacy in the Banking Sub-Sector of the Nigeria Economy: Efficacy of Camels. (A Model Specification with Co-Integration Analysis). *International Journal of Academic Research in Business and Social Sciences. Vol. 1, No. 3*

APPENDIX
SPSS OUTPUT

Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	CAR ^b	.	Enter

a. Dependent Variable: ROA

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.190 ^a	.036	.027	7.64206

a. Predictors: (Constant), CAR

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	223.052	1	223.052	3.819	.053 ^b
	Residual	5956.907	102	58.401		
	Total	6179.958	103			

a. Dependent Variable: ROA

b. Predictors: (Constant), CAR

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.383	1.512		-.253	.801
	CAR	.148	.076	.190	1.954	.053

a. Dependent Variable: ROA

Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	CAR ^b	.	Enter

a. Dependent Variable: ROE

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.473 ^a	.223	.216	16.47610

a. Predictors: (Constant), CAR

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7960.860	1	7960.860	29.326	.000 ^b
	Residual	27689.116	102	271.462		
	Total	35649.976	103			

a. Dependent Variable: ROE

b. Predictors: (Constant), CAR

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-4.152	3.259		-1.274	.206
	CAR	.886	.164	.473	5.415	.000

a. Dependent Variable: ROE