# Effect of Capital Adequacy Requirements on the Profitability of Commercial Banks in Nigeria

## Ini S. Udom

<sup>1</sup>MacroView Consulting Limited, Abuja-Nigeria

## Eze, Onyekachi R.

Department of Accountancy, Banking and Finance Ebonyi State University, Abakaliki

#### Abstract

This study examined the effect of capital adequacy requirements on the performance of commercial banks in Nigeria. The study used secondary time series data sourced from the NDIC and CBN Annual and Bank Supervision Reports. The data analysis technique employed include the Ordinary Least Squares (OLS) regression method. The overall capital adequacy variables of the study shows that ASF, CRWA, TQC together have significant effect on the dependent variable, Return on Asset (ROA), which measures bank performance. The results further show that capital adequacy impact positively on the financial performance of commercial banks in Nigeria. This implies that capital adequacy strongly and actively stimulate, improve and grow the financial performance of commercial banks and that sufficiency of capital and adequate management can translate to improved performance. Based on the findings, the study recommends for improvement in the management of bank assets and liabilities, especially on the quality of assets portfolio and deposit liabilities in order to improve on the achievement of corporate objectives, and for the corporate governance process to be enhanced by adopting international best practices. The regulatory framework should also be enhanced to be more dynamic and effective as this will impact positively on bank management and enhance financial performance of commercial banks in Nigeria.

**Keywords:** Total Qualifying Capital (TQC), Adjusted Shareholders Fund (ASF), Capital to Risk Weighted Assets (CRWA), Return on Assets (ROA), GDP

## 1. Introduction

In a modern economy, the role of the financial system is to lubricate the gears facilitating economic operations. The gains of the real sector largely depend on how the financial institutions perform the financial intermediation functions. The banking system plays the role of transferring funds from the saving unites to the investing units (Saona, 2011), thereby generating reasonable income in the process.

Due to the obvious importance of the financial system, its safety and soundness has remained a major concern of governments. Accordingly, banks are highly regulated in most countries. The more specific objectives of regulation have been to protect depositors, to promote a stable money supply by preventing financial panics, and foster an efficient and competitive banking system that facilitates financial intermediation (Mitchell, 1984). To achieve these objectives, government limits the activities and practices of banks and control the environment in which they operate. Governments also establish regulatory and supervisory agencies.

These entities establish the conditions of entry, the compliance with capital ratios, and liquidity rules, the enforcement of larger exposure rules, and the right of inspection (Saona, 2011, Valdez, 2001). The essence is to deter excessive risk taking. For some countries, the regulatory framework is very complex, representing a mixed mechanism of control on the industry which determines to an extent, both the capital structure decision making process and hence their earnings or profitability.

Generally, banks are expected to make profit to absorb losses from their normal earnings. Without profits, no firm can survive and attract outside capital to meet its investment needs, including banks. Thus, profitability plays a key role in persuading depositors to supply funding, bank deposits in good terms. It is an essential element to the survival of financial institutions. Profit is believed to be the cheapest source of funds to banks. Babakova (2013) posits that the basic desire of any bank management is to make profit. Okoye and Eze (2013) describe the three principles guiding banking regulations as profitability, liquidity and safety.

On profitability, one of its main determinants is the bank's capital structure (Saona, 2011). Bank capital plays a central role in the safety and soundness of individual banks. It supports future growth and fosters public confidence in the banks. It provides the capacity under the banks legal lending limits to serve customers need and protect the bank from unexpected losses (Furlong 2008). It is also a central issue of prudential regulation (Torbira and Zaagha, 2016). Adequate capital is therefore considered a sine qua non in the financial sector and for banks in particular. Capital adequacy involves setting minimum requirements for market risk in the books of banks and investment companies. This includes specifying standards, covering risk management and solvency ratio requirements (Torbira and Zaagha, 2016: Girardone and Molyneux, 2006). Conventionally, a bank's statutory capital is considered as adequate if it is enough to cover the bank's operational expenses, satisfy customers' withdrawal needs and protect depositors against total or partial loss of deposits in the event of liquidation or losses sustained by the bank (Onuh, 2002).

Banking regulation in accordance with the Basel Accord requires that banks properly access the risk they take. A weak banking system may threaten the stability of the economy. However, control mechanisms on banks in form of minimum requirements to a large extent determine the capital structure decision making process and the performance, profitability of banks (Saona, 2011).

Financial performance is an assessment of the financial conditions or profitability of a bank in order to gain insight into the health of the bank using an index that relates two pieces of financial data, called financial ratios (Torbira and Zaagha, 2016). Some previous studies have attempted to show that capital adequacy measures indeed influence the financial performance variable of businesses in general and banks in particular. While there seems to agree on the significant global effect of capital adequacy on business performance, they appear to be disagreement in respect of the relative effects on the financial performance of banks in Nigeria. Onoalapo and Olufemi (2012) study reveal that, capital adequacy ratio did not reflect the profitability of banks represented by Return on Assets, Return on Capital Employed and Percentage of Profit before Tax. Similarly, Santos (2000) asserts that bank regulation through higher capital requirements negatively affect bank development and credit expansion by increasing fixed and operating costs.

However, Ezike and Oke (2013) study shows that capital adequacy proxied by Shareholders Fund exert positive influence on banks' profit, total assets, total deposits, return on assets, earnings per share, loans and advances and credit risk, although not all were statistically significant.

From the foregoing, the effect of capital adequacy on bank profitability seems inconclusive. The findings of previous studies on the nature of effect of capital adequacy on performance indicators of banks have been inconsistent. Thus, the controversy surrounding the nature of the effect of the proxies of capital adequacy on financial performance of banks, constitute a research burden which this study will attempt to investigate further.

# 2. Review of Related Literature

# 2.1 Conceptual Review

# 2.1.1 Bank Capital and Capital Adequacy Requirements

Bank capital may be defined as the value of its net assets (total assets minus total liabilities). Thus, capital is the sum of the paid up share capital and its accumulated reserves (Torbira and Zaagha, 2016). According to Nzotta (2004), bank capital is the equity value of a bank reduced to the present value of its future earnings. Generally, bank capital represents the owners' net worth in a bank and it includes the pay in capital and all additions to the capital resources of the bank (Ejoh and Iwara, 2014).

Accounting theory however sees capital as a net worth which equals the accumulative value of liability ad represents ownership interest in a firm. In banking, regulators refer to capital as those funds contributed by the owners consisting principally of stocks, surplus (reserves) for contingencies and retained earnings. A balance sheet classification of a bank capital will generally include ordinary share capital or equity reserves and preference shares. Loan Capital may be referred to as long term capital while reserves may also include share premium and revaluation reserves (Rose, 1999 and Arogundade, 1999).

With the Basel Accord (2008), operational capital is observed to consist of core capital (Primary or Tier 1 capital) and supplemental capital (Secondary or Tier 2 Capital). Thus, components of the two tiers of bank capital will include equity capital i.e. common stocks + perpetual preferred stock +surplus funds + bonus issue reserve + minority equity interest in subsidiary companies. Core capital refers to equity capital and goodwill. Supplemental capital relates to provision for loan loss + preferential shares + convertible shares (hybrid capital instruments + revaluation reserves.

Bank capital helps in maintaining confidence of the public in the bank. It assures the public that depositors' funds are safe, that the bank can accommodate the credit needs of the community. It also serves as a means of assessing the strength of a bank, assuring the regulatory bodies that the financial system is not threatened or weakened by any crisis in a single bank or group of banks. Bank capital also ensures the safety of a bank, and helps the bank to avoid the risk of insolvency and supports the credit risk a bank is called upon to assume in a normal business lending. The larger the capital resources, the more loans and advances the bank could grant both on the aggregate and for single individuals (Ejoh and Iwara, 2014).

## 2.2 Empirical Review

Previous attempts made to empirically evaluate the effect of capital adequacy requirement on bank profitability include but not limited to the following: Ugwuanyi and Enah (2015) examined with intent to ascertain whether bank capital requirement as a regulatory tool in Nigeria enhances bank performance. Using simple ratio analysis and least square statistical technique on key profitability indicators, they compared the performance of the bank five years before and five years after the 2005 recapitalization exercise. The study shows that most of the bank performance evaluation indicators revealed that pre-capitalization means are better than the post capitalization means and the t-test shows that the difference between the two means at 5% level of significance is not statistically significant, that recapitalization without a conducive and sound macro-economic environment does not always transform to enhanced bank performance. The study recommends for a study on suitable macro-economic environmental factors that would enhance bank performance alongside capital base.

Adopting the Engle and Granger two steps procedure in co-integration and the t-statistics to determine significance, Ejoh and Iwara (2014) assessed the impact of capital adequacy on deposit money banks' profitability in Nigeria for the period 1981-2011 on five selected banks. The study shows that capital adequacy plays an important role in explaining bank returns on assets (ROA) which is a measure of bank profitability. The study recommends that there should be a constant review of the minimum capital requirement of deposit money banks in Nigeria to the optimal level, that Nigerian banks should be well capitalized to enable them enjoy access to cheaper sources of funds with

subsequent improvement in profit levels which would help the public maintain confidence in the banks and also accommodate the credit needs of customers.

Using the OLS estimation techniques, Ezike and Oke (2013) investigated the impact of the adoption of the capital adequacy standards on the performance of Nigerian banks. The study examined the effect of the independent variables of loans and advances, shareholders fund, total assets and customer deposits on the dependent variable of Earnings per share (EPS) and profit after tax. The study showed that capital adequacy standards exert a major influence on bank performance. The study concluded with the recommendation that the CBN should not rely solely on the capitalization of banks as a determinant of bank performance but also should concentrate on efficient and effective bank supervision and risk management.

Ayayalin and Karakaya (2014) applied the two step system generalized method of moment technique for dynamic panel using bank level date for Turkish banking sector over the period 2003 to 2011, to investigate the impact of banks' capital on profitability and risk. The study found evidence that the effect of increasing bank capital on risk is significantly positive and negative, and that there is a positive and negative relationship between capital and profitability. The study indicates different profitability variables present different patterns with capital. Hence, the authorities should realize that using a single profitability variable may result in a totally wrong policy and that banking supervision regulation should improve their banking system by mending the financial efficiency of commercial banks to implement the suggestions proposed in Basel III.

Using cross sectional and time series of bank data and employing the OLS regression method, Ikpefan (2015) determined the impact of bank capital adequacy ratios, management and performance in the Nigerian commercial banks. The study shared that Shareholders Fund/Total Assets which measures capital adequacy (risk of default) have negative impact on Return on Assets. The efficiency of management measured by operational expenses indices is negatively related to return on capital. The study recommends that regulatory authorities put in place measures to raise the level of capital adequacy ratio to avoid future bank collapse and support management capability as the best asset can be over turned in short period by management while calling on government to provide an enabling environment.

Onaolapo and Olufemi (2012) examined the effect of capital adequacy on the profitability of the Nigerian banking sector using OLS estimation from an SPSS 17.0 package on measured capital adequacy ratio and bank performance variables over a ten year period, 1999-2008, and the Augmented Dickey Fuller (ADF) to test for stationary of the data. The study further conducted a pair wise granger causality test to determine the co-integration between the study variables. Findings reveal that the bank performance variables tested, Return on Capital Employed (ROCE), Return on Assets (ROA), Efficiency Ratio (ER) does not have significant effect on capital adequacy of the banking sector. They recommend pragmatic governance and stable economic and financial environment for better performance of commercial banks in Nigeria.

Using descriptive correlation methods augmented by some regression analysis, Ranga (2012) analyzed the impact of minimum capital requirements on commercial banks performance in Zimbabwe. Employing twenty seven senior bank executives as the population of the study, the findings reveal a significant and positive relationship between commercial banks capitalization and its performance. The study recommends that the basis for capital to be held by bank should be in line with the risk a bank is exposed to, hence the higher the risk profile of a bank, the higher the capital should be.

Using Augmented Dickey Fuller unit root test, and the Granger causality test, Torbira and Zaagha (2016) investigated the impact of capital adequacy indicators, the ratio of shareholders fund to banks' total deposits (SHF/BID) and the ratio of shareholder funds to bank total assets (SHF/BTA) on bank financial performance measures, net profit margin (NPM), earnings per share (EPS) and return on assets (ROA) in Nigeria. The analysis reveal the existence of significant long run relationship between bank financial performance variables and capital adequacy indicators in the Nigerian banking industry: that capital adequacy strongly and actively stimulate and improve the financial performance of banks in Nigeria. The study recommends that bank managers should improve on the management of bank

deposits and assets, introduce adequate short term investment in the portfolio of banks in order to improve the financial performance of the banks.

A critique look at the foregoing, the effect of capital adequacy on bank financial performance seems inconclusive and inconsistent. Equally, is the appropriateness of the methods adopted as it concerns the choice of variables and research design. There is therefore the need to employ fitting empirical methods that will use the more appropriate variables, data, model and analytical tools.

#### 2.3 Theoretical Framework

There are several theories which seek to explain the nexus between bank capital requirement and profitability. However, this study is premised on the buffer theory of capital adequacy.

## The Buffer Theory of Capital Adequacy

This theory was developed by Calem and Rob (1996) and used by Ikpefan (2013), Ederin (2014) and Odunga, et al (2013). The theory predicts that a bank approaching the required minimum capital ratio may have an incentive to boost capital and reduce risk in order to avoid the regulatory costs triggered by a breach of the capital requirements. In view of this, Ikpefan (2013) posited that banks prefer to hold a buffer capital to reduce the probability of falling under the legal capital requirement especially if the capital adequacy ratio is very volatile. Poorly capitalized banks may also be induced to take additional risk in the hope that higher expected returns will help to increase the capital.

# 3. Methodology and Analysis

# 3.1 Methodology

This study employs the quantitative research design. This is because the study involves events that have already taken place (Onwumere, 2009). Annual aggregate bank data on return on assets, total qualifying capital and adjusted shareholders fund, annual inflation rate and gross domestic product growth rate has been generated from secondary sources (NDIC and CBN Annual Reports and CBN statistical bulletin) for the period of 1996 to 2016.

#### Variables

The variables that were predicted by theories, bank supervisors' measurement criteria adopted by the CBN and previous empirical studies were used in the analysis. The dependent variable is Return on Assets (ROA), a measure of profitability while the independent variables used were Bank Total Qualifying Capital (TQC), Adjusted Shareholders Fund (ASF), Capital Risk Weighted Assets (CRWA), as capital and capital adequacy variables and Inflation Rate (INF) and Gross Domestic Product Growth Rate (GDPGR), being macroeconomic control variables.

A regression of a variable, Y on X is an equation model that expresses the influence of Y (the dependent variable) on X (the independent or explanatory variable).

Symbolically, the linear regression is:

Y = F(X) that is, Y is a function of X:

 $Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \mu$ 

Where,

Y= the dependent variable (profitability)

X= the independent variable

 $\beta_0$ = the intercept, that is, the value of the dependent variable Y, when the explanatory variable X assumes a value of zero.

 $\beta_1$ ..... $\beta_n$ = coefficient of the explanatory variables or the slope, that is, the rate at which a change in the explanatory variable affects the behaviour of the dependent variable and  $\mu$  is the error

term. The Ordinary Least Squares (OLS) technique will be used to estimate the effect of capital adequacy variables on bank performance indicators.

The mathematical form of the model is specified in a functional relationship as follows;

$$ROA = F (TQA, ASF, CRWA)...$$
 (1)

Where:

ROA = Return on Assets

TQA = Total Qualifying Assets

ASF = Adjusted Shareholders Fund

CRWA = Credit to Risk Weighted Assets

INF = Inflation Rate

GDPGR= Gross Domestic Product Growth Rate

The OLS linear regression equation based on the above functional relation for the model is econometrically stated as:

ROA= 
$$\beta$$
o +  $\beta_1$ TQR +  $\beta_2$  ASF +  $\beta_3$  CRWA +  $\beta_4$  INF+  $\beta_5$  GDPGR+  $\mu$ ... (2)  
Where,  $\mu$  = Error term

## 3.2 Empirical Result

## **3.2.1 Descriptive Statistics**

Table 1 below shows the summary characteristics of the individual variables that is, the mean, median, maximum, minimum, standard deviation, skewness, kurtosis, as well as Jarque-Bera statistics and their respective probability values.

	ROA	ASF	CRWA	GDPGR	INF	TQC
Mean	1.749048	1062.130	15.93381	5.548095	12.26667	1109.735
Median	2.400000	448.9900	16.45000	5.960000	11.80000	448.9900
Maximum	4.090000	2802.000	22.60000	12.28000	23.80000	3000.300
Minimum	-9.820000	18.65000	3.900000	-1.760000	6.600000	17.25000
Std. Dev.	2.858898	1040.262	4.705968	2.845791	3.935014	1123.231
Skewness	-3.310835	0.482793	-1.379094	-0.237248	1.250623	0.487597
Kurtosis	14.15871	1.489655	4.734312	4.426871	4.733971	1.465185
Jarque-Bera	147.3180	2.811813	9.288506	1.978469	8.105024	2.893327
Probability	0.000000	0.245145	0.009617	0.371861	0.017379	0.235354
Sum	36.73000	22304.72	334.6100	116.5100	257.6000	23304.44
Sum Sq. Dev.	163.4660	21642885	442.9227	161.9705	309.6867	25232977
Observations	21	21	21	21	21	21

Table 4.1 above shows the descriptive statistics of the individual variables used in the study. The individual variables have the following mean values: Return on assets (ROA) 1.74, ASF 1,062.13, CRWA 15.93, GDPGR 5.548, INF 12.67, and TQC 1,109.74, respectively. The maximum and minimum values are respectively, Return on assets (ROA) 4.09 and -9.82, ASF 2,802 and 18.65, CRWA 22,600 and 3.9, GDPGR 12.28 and -1.76, INF 23.8 and 6.6; and TQC 3,000.3 and 17.25.

The Jarque-Bera statistic and the corresponding probabilities are ROA 147.318(0.000), ASF 2.812(0.245), CRWA 9.286(0.0096) GDPGR 1.9785(0.3719), INF 8.105(0.017), TQC 2.893(0.2354), meaning that whereas ASF, GDPGR, TQC are normally distributed, ROA, CRWA, and INF are not normally distributed.

## 3.2.2 Empirical Results

## **Level Series Regression Estimates**

Table 2 below shows the results of the level series OLS regression estimates of the parameters.

**Table 2:** Results of the level series OLS regression estimate

Dependent Variable: ROA Method: Least Squares Date: 04/19/17 Time: 13:37 Sample: 1996 2016 Included observations: 21

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
С	-2.351044	4.145028	-0.567196	0.5790	
ASF	0.000824	0.001662 0.496019		0.6271	
CRWA	0.174379	0.169164 1.030827		0.3190	
GDPGR	0.025852	0.273627	0.094479	0.9260	
INF	0.065878	0.189758	0.347167	0.7333	
TQC	-0.000455	0.001566	-0.290763	0.7752	
R-squared	0.098814	Mean dependent var		1.749048	
Adjusted R-squared	djusted R-squared -0.201582 S.D. dependent var		2.858898		
S.E. of regression	E. of regression 3.133829 Akaike info criterion		5.357345		
Sum squared resid	m squared resid 147.3133 Schwarz criterion		5.655780		
Log likelihood	lihood -50.25212 Hannan-Quinn criter.			5.422113	
F-statistic	0.328946	Durbin-Watson stat	2.798772		
Prob(F-statistic)	0.887659				

The level series regression estimates in Table 4.3 above shows a Durbin Watson statistics of 2% indicating the presence of auto-correlation and suggest that the variables may be non-stationary which render the result spurious and non-meaningful. The data therefore requires further rigorous econometric analysis including stationarity test, unit root, co-integration in the error correction mechanism to establish stationarity of the variables as well as long run and short run equilibrium relationship of the variables in the model.

## 3.2.3 Error Correction Mechanism (ECM)

Having established long run equilibrium and causality relationship between the dependent and independent variables, the study now attempts to establish short run relationships between the dependent and independent variables using the error correction mechanism. Since the variables were found to be stationary at first difference, the error correction mechanism is tested using first differenced series. The results are presented in Table 4.6 below.

**Table 3:** Parsimonious Error Correction Results

Dependent Variable: ROA Method: Least Squares Date: 04/20/17 Time: 05:59 Sample (adjusted): 1998 2016

Included observations: 19 after adjustments

included observations. 19 after adjustments							
Variable	Coefficient	Std. Error	t-Statistic	Prob.			
С	-10.56642	3.377787	-3.128207	0.0096			
ASF	0.002113	0.001128	1.872387	0.0880			
D(ASF(-1))	-0.003470	0.000939	-3.694706	0.0035			
CRWA	0.711990	0.160331	4.440760	0.0010			
GDPGR	-0.413448	0.228369	-1.810435	0.0976			
INF	0.277860	0.137520	2.020512	0.0684			
TQC	-0.001662	0.001057	-1.571455	0.1444			
ECM01(-1)	-0.427734	0.242938	-1.760668	0.1060			
R-squared	0.717371	Mean dependent var		1.824737			
Adjusted R-squared	0.537516	S.D. dependent var	3.002094				
S.E. of regression	gression 2.041610 Akaike inf		ike info criterion				
Sum squared resid	45.84990 Schwarz criterion		4.958575				
Log likelihood	og likelihood -35.32870 Hannan-Quinr		uinn criter.				
F-statistic	3.988606	Durbin-Watson stat		1.870789			
Prob(F-statistic)	0.020494						

The results in Table 3 reveals that ASF has a low positive coefficient of 0.002, meaning a unit change in ASF causes a 0.2 percent change in ROA, with a t-value of 1.87 and a probability of 0.08 which is insignificant at 5% but significant at 10%. When lagged one period, ASF turns from a positive coefficient to a negative coefficient, meaning the positive relationship between ROA and ASF is only short lived.

CRWA shows a strong positive coefficient of 0.71 indicating that a unit increase in CRWA brings about a corresponding 0.71 unit increase in ROA. CRWA also shows a t-value of 4.44 with a probability value of 0.01, which is significant at 5%.

GDPGR shows a negative coefficient of -0.413448 indicating that a unit increase in GDPGR brings about a 0.4 decrease in ROA. GDPGR also shows a t-value of -1.81 with a probability of 0.097 which is insignificant at 5 percent, but significant at 10 percent.

INF shows a positive coefficient of 0.2778 indicating that a unit increase in INF brings about a 0.28 increase in ROA. INF also shows a t-value of 2.02 with a probability value of 0.068, which is insignificant at 5 percent, but significant at 10 percent.

TQC shows a negative coefficient of -0.0017 indicating that a unit increase in TQR brings about a 0.0.0017 decrease in ROA. In addition, TQR shows a t-value of -1.57 with a probability value of 0.144, which is insignificant.

The R-square is 0.71 meaning that the combined effect of the explanatory variables (ASF, CRWA, GDPGR, INF, and TQC) accounting for 71 percent of changes in ROA; while the adjusted r-squared is 0.537.

The F-statistic shows 3.9886 with a probability value of 0.02, which is significant, meaning that the explanatory variables (ASF, CRWA, GDPGR, INF, and TQR) together have significant effect on the dependent variable, ROA.

The Durbin-Watson is 1.87, which is very close to 2, indicating absence of autocorrelation.

The error correction coefficient is appropriately signed with a probability of 0.106, which is insignificant at 5 percent, but significant at 10 percent. This means that at 10 percent level of significance, the model has 44.77 percent ability to adjust to long run equilibrium.

## 4. Conclusion and Recommendations

## 4.1 Conclusion

The study focused on the effect of capital adequacy requirements on the profitability of commercial banks in Nigeria. The data analysis technique employed in this study include the ordinary least squares regression method, the Johansen co-integration technique and Granger causality procedure on time series data from 1986 to 2016.

The Johansen co-integration test reveal a long run equilibrium relationship with the dependent variable (ROA). The Granger causality test was also used to determine the direction of indicators of capital and capital adequacy and bank profitability. The results indicate that ASF, CRWA and TQC significantly granger cause ROA but not the other way round. There exists thus, a uni-directional causal relationship between the explanatory variables and ROA. The results show that capital adequacy impact positively on the financial performance of commercial banks in Nigeria.

The findings leads to the following conclusions. The cause-effect analysis reveals that causality runs unidirectionally between the explanatory variables and ROA. This provides evidence for the existence of the impact of capital adequacy on bank financial performance. There is also evidence for strong long run cointegrating relationships.

The study concludes that capital adequacy positively stimulate financial performance of commercial banks in Nigeria. There is also a long run equilibrium relationship between capital and capital adequacy measures and the financial performance indicator. This implies that adequate and good management of same can stimulate and engender improved financial performance of commercial banks through efficient portfolio management, asset selection and proper matching of assets and liabilities.

#### 4.2 Recommendations

Following from the findings of the study, the following recommendations are proffered towards enhancing the effect of bank capital and it's adequacy on the financial performance of commercial banks in Nigeria.

- 1. Bank management should improve on the management of bank assets and liabilities, especially on the quality of assets portfolio and deposit liabilities in order to improve on the achievement of corporate objectives.
- 2. The corporate governance process be enhanced, adopting international best practices.
- 3. The regulatory framework be enhanced to be more dynamic and effective as this will impact positively on bank management which will enhance financial performance of commercial banks in Nigeria.
- 4. The macro-economic environment is critical to an enhanced performance of commercial banks in Nigeria. Gross Domestic Product growth shows a negative coefficient of -0.413 on ROA, with inflations showing a positive coefficient of 0.82118 on bank performance as shown in this study. The combined effect is that a stable macro-economic environment will enhance bank performance. Thus, government should strive at achieving stable macro-economic environment that is conducive for economic activities.

## References

- [1] Torbira, L. L and Zaagha, A.S (2016) Capital Adequacy Measures and Bank Financial Performance in Nigeria: A Cointegration Analysis, Journal of Finance and Economic Research, 3 (1): pg No
- [2] Ikpefan O.A (2013) Capital Adequacy, Management and Performance in Nigeria Commercial Bank, African Journal of Business Management, 7(30) 2938-2950
- [3] Asikhia, O and Sokefun (2013) Capital Adequacy and Bank Profitability: Empirical Evidence from Nigeria, American Internal Journal of Contemporary Research, 3(10)
- [4] Oladejo and Oladipupo (2011) Capital Regulation and the Performance of Nigerian Banks: Need for Review, Scholar Link Research Institute Journal.
- [5] Ranga M (2012) Analysis of the Impact of Minimum Capital Requirements on Commercial Bank Performance in Zimbabwe, IJRS Publications
- [6] Onaolapo and Adebayo E. O (2012) Effect of Capital Adequacy on the Profitability of the Nigerian Banking Sector, Journal of Money, Investment and Banking, Euro Journals
- [7] Vyas R.K, Singh M and Yadav R (2008) The Impact of Capital Adequacy Requirements on Performance of Scheduled Commercial Banks, Asia- Pacific Business Review.
- [8] Naceur S.B and Kandil M (2006) Impact of Capital Requirements on Bank Performance: The Case of Egypt: International Monetary Fund, IMF Institute, 700 19<sup>th</sup> Street, Washington DC, 20413
- [9] Ezike E.E and Oke M.O (2013) Capital Adequacy Standards, Basel Accord and Bank Performance: The Nigerian Experience (A Case Study of Selected Banks in Nigeria) Asian Economic and Financial Review, 3 (2), 146-159
- [10] Onwumere J.U (2009) Business and economic Research Methods, Don Viton Ltd, Lagos
- [11] Ayaydin H and A. Karakaya (2014) Effect of Bank Capital on Profitability and Risk in Turkish Banking, International Journal of Business and Social Science 5(1)
- [12] Ugwuanyi G.O and Ewah E.B (2015) Bank Capital Requirements as Regulatory Tool in Nigeria- a critique, International Journal of Economics, Commerce and Management 3(2)
- [13] Ejoh N.O and Lovara U.U (2014) Impact of Capital Adequacy on Deposit Money Banks Profitability in Nigeria, Research Journal of Finance and Accounting, 5 (12)
- [14] Saona P.H (2011) Determinants of the Profitability of the US Banking Industry, International Journal of Business and Social Science 2(22) 222-269

- [15] Mitchell K. (1984) Capital Adequacy at Commercial Banks, Economic Review, September/October, Federal Reserve Bank of Kansas
- [16] Babakova I.V (2013) Raising the Profitability of Commercial Banks, BLATEC, 11
- [17] Okoye V. and Eze O.R (2013) Effect of Bank Lending Rate on the Performance of Nigerian Deposit Money Banks. International Journal of business and Management Review, 1(1), 34-43
- [18] Furlong F.T (2008) Capital Regulation and Bank Lending, Federal Reserve Bank of San Francisco, Economic Review (3) 23-33
- [19] Onuh J.K (2002) Dynamics of Money, Banking and Finance in Nigeria-an Emerging market, Asian Meridian Publishers, Aba, Nigeria
- [20] Santos J. A. C (2000) Bank Capital Regulation in Contemporary Banking Theory: A Review of Literature, BIS Working Paper, 90, 1-32.
- [21] Nzotta S.M (2004) Money, Banking and Finance (Theory and Practice) 2<sup>nd</sup> Edition, Hudson Jude Nigeria Publishers
- [22] Rose P. S (1999) Commercial Bank Management, Irwin McGraw Hill, 4<sup>th</sup> Edition.
- [23] Chikoko Laurine and Pierre Le Roux (2013) The impact of Minimum Capital Requirements on Zimbabwe Commercial Banks Lending, International Journal of Finance and Accounting, 2(3): 131-137
- [24] Bank for International Settlement (2010). An Assessment of the Long-term Economic Impact of Stronger Capital and Liquidity Requirements, Basel Committee on Banking Supervision, Bank for International Settlements
- [25] Girardone, C. and Molyneux, P. (2006) Introduction to Banking, prentice Hall, ISBN 027693026
- [26] Arogundade A.O (1999) Capital Adequacy and Capacity Issues, focus on Nigeria, July-December
- [27] Trujillo-Ponce, A (2013) What Determines the Profitability of Banks? Evidence from Spain, Journal of Accounting and Finance, 53, 561-586.
- [28] Aremu, M.A, Ekpo I.O and Mustapha A.M (2013), Determinants of Banks' profitability in a Developing Economy: Evidence from Nigerian banking Industry. Interdisciplinary Journal of contemporary Research in Business. 4(9)
- [29] Harod S. (1999) Capital Adequacy, Will Risk- based Measurement Help? Credit Union Executive Journal 39(6)
- [30] Arogbeyen, O. and Olufemi, J (2011) The Impact of Recapitalization and Consolidation on Banks Cost of Equity in Nigeria. International Journal of Business Management, 5(3), 159-165
- [31] Osuka B.O and Osaduna C.K (2013) Determinants of Financial Performance of Quoted Banks in Nigeria: A study of Selected Deposit Money Banks (2001-2010), International Journal of Education Research, 1(10) 1-18
- [32] Onoh J.K (2002) Dynamics of Money, Banking and Finance in Nigeria: An Emerging Market, Asian Meridian Publishers, Lagos
- [33] Crosse H.D and Hansel G.H (1980) Management Policies for Commercial Banks, Bankers Publishing Company, Houston
- [34] Onalaopo A.A and Adebayo E.O (2013) Effect of Capital Adequacy on the Profitability of the Nigerian Banking Sector, Journal of Money, Investment and Banking, Euro Publishing Inc
- [35] Olalekan A and Adejunka S. (2013) Capital Adequacy and Bank Profitability: An Empirical Evidence from Nigeria, American International Journal of Contemporary Research, 3(10)
- [36] Haward P and Upton A. (1991) Introduction to Business Finance, New York, McGraw Hill
- [37] Jahan N. (2012) Determinants of Bank Profitability, Evidence from Bangladesh. Indian Journal of Finance. 6(2), 32-38.
- [38] Hassan M.K and Bashir A.H.M (2003) Determinants of Islamic Banking Profitability, in the 10<sup>th</sup> ERF Annual Conference, Morocco, December, 16-18.

- [39] Mathuva D.M (2009) Capital Adequacy, Cost-income Ratio on the Performance of Commercial banks, the Kenyan Scenerio. The International journal of Applied Economics and Finance, 3(2), 35-47.
- [40] Flamini V.M and Schumacher (2009) Determinants of Commercial Bank Profitability in Sub-Saharan African, IMF Working Paper 09/15, IMF, Washington
- [41] Odunga R.M, Nyangweso P.M, Carter D.A and Mwarumba M. (2013) Credit Risk, Capital Adequacy and Operating Efficiency of Commercial Banks in Kenya, International Journal of Business and Management Invention. 2(91), 6-12.
- [42] Peltzman (1970) Capital Investment in Commercial Banking and its Relationship to Portfolio Regulation, Journal of Finance 78(1) 7-26
- [43] Calem P.S and Rob R. (1996) Impact of Capital Based Regulation on Banks' Risk Taking: A dynamic model, Board of Governors of the Federal Reserve System Finance and Economic Discussion Series 96/12, (36)
- [44] Athanasogiou P.P, Brissime S.N, Delis MD (2005) Bank Specific, Industry Specific and Macroeconomic Determinants of Bank Profitability, Bank of Greece Working Paper, 25:1-10
- [45] Laurine C and Le Roux P (2013) Impact of Minimum Capital Requirements on Zimbabwe Commercial Bank Lending, International Journal of Finance and Accounting 2(3) 131-137
- [46] Williams H.T (2011) Determinants of Capital Adequacy in the Banking Sub Sector of the Nigerian Economy: Efficacy of Camels (A model specification with Co-integration analysis), International Journal of Academic Research in Business and Social Sciences, October 1(3)
- [47] Edirin J. (2014) Assessing the Relationship between Non Performing Loans and the Financial Soundness of Banks in Nigeria (2003-2012), Journal of Arts and Social Sciences 3(1) 115-125
- [48] Trujillo-Ponce A (2012) What Determines the Profitability of Banks? Evidence from Spain, Accounting and Finance 53(2)
- [49] Ozili P.K (2015) Determinants of Bank Profitability and Basel Capital Regulation, Empirical Evidence from Nigeria, Research Journal of Finance and Accounting 6(2)
- [50] Furlong F.T (1992) Capital Regulation and Bank Lending, Federal Reserve Bank of San Francisco Economic Review 3:22-33
- [51] Central Bank of Nigeria (2016) Financial Stability Report
- [52] Central Bank of Nigeria (2015) Annual Statistical Bulletin
- [53] Central Bank of Nigeria (1998- 2014) Annual Banking Supervision Reports
- [54] Central Bank of Nigeria (2008- 2015) Annual Report and Statement of Accounts
- [55] Central Bank of Nigeria (2009) Guidance Notes on the Calculation of Capital Adequacy Requirement for Market Risk Standardization Approach.