Capital Adequacy and Banks Performance: Evidence from Deposit Money Banks in Nigeria

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Abstract:-The paper examines the effect of capital adequacy on performance of deposit money banks in Nigeria. Banking sector is one of the most regulated sectors in any economy and the Nigeria Banking sector is not an exemption. This constant regulation is to minimize the bank failures and distresses. The study captures performance indicators and employed panel data made up of one hundred and eight observations comprising of nine cross-sectional units for period of twelve years. The collected data were estimated using Pooled regression effect estimation via Stata 2014 statistical package. Findings from the results showed a positive relationship between capital adequacy ratio (CAR) and return on assets (ROA). The study also found that there is a positive significant relationship between deposit to asset ratio and bank performance. The study concludes that capital adequacy improves performance of Nigeria deposit money banks. The paper recommends continuous monitoring of banks in line with capital adequacy for optimal performance.

Key words: Capital Adequacy, Banks Performance and Deposit Money Banks

I. INTRODUCTION

Capital is an essential requirement for the efficient and effective operation of any business enterprise including banks. The banking sector is critical due to the vital role it plays in the growth and development of an economy. Banks to a large extent, wield control over the supply of money in circulation and stimulate economic progress (Eyo & Amenawo 2015). Therefore, a strong banking sector is vital to facilitate the utilization of idle funds, promote growth, create jobs, generate wealth, eradicate poverty, entrepreneurial activity and increase in Gross Domestic Product (GDP).

The stability of banks therefore is of utmost importance to the regulatory body so as to strengthen the economy which will eventually aid the growth and development of a nation. To bring about this stability in the banking sector, the apex authority which is the Central Bank of Nigeria (CBN) continuously regulates the minimum paid-up capital of banking organizations. This is because deposits solicited from customers is different from paid up capital and as such is not as dependable as the bank's capital requirement and so cannot be used for long term planning (Ikpefan 2013).

From the perspective of Basel committee on bank supervision, Capital adequacy ratio measures a bank's capital in relation to its risk-weighted assets. Therefore it is a measure of the amount of a bank's capital expressed as a percentage of its risk weighted credit exposures (Reserve Bank of New Zealand, 2007).

Capital Adequacy Ratio (CAR) is basically the proportion of the bank's tier 1& tier 2 equity (Qualifying capital or Equity) as a proportion of its risk weighted assets (loans). It is the proportion of a bank's own equity in relation to its risk exposure (CBN, 2014).

Performance may be defined as the execution, achievement, or accomplishment of specific activities. Bank performance reflect the way in which the resources of banks are used to achieve its objectives. It is the adoption of a set of indicators which are measures of the bank's current status, effectiveness and efficiency (Reserve bank of India, 2014).Bank performance demonstrates the efficient use of resources and the ability of a business to make profit (Ben & Mohamed 2013). It is an assessment of the financial conditions and health of a bank using financial ratios (Torbira and Zaagha 2016). Hence bank performance is very crucial to the various stakeholders such as depositors, creditors, shareholders, government and managers. Capital plays an important role in enhancing banks' performance and ensuring its continued corporate existence because adequate capital will propel the bank towards effectiveness and efficiency as well as diversification of its resources. It ensures safety of customers'deposits, protects the shareholders fund, improve public confidence and assures the regulatory authorities that the financial system is safe.

1.0 Objective of the study

To determine whether it can be said with consistency that getting enough capital can effect positively, negatively or not at all on the financial performance of Banks in Nigeria is a major problem that this study seeks to address. This is because there are divergent views and outcomes as to the existence and nature of the effect of capital adequacy on bank performances. For instance, Gull, S., Irshad, F. and Zaman, K.,(2011), Onaolapo and Olufemi (2012) opined that there is no significant relationship between capital adequacy and bank performance. In a related development Ipkefan (2013) in his own submission maintained that there is a negative relationship between capital adequacy and bank performance. Conversely Ndifon and Ubana (2014), John and Okem (2013) and Jalloh (2017) unanimously asserted that there is a significant positive relationship between capital adequacy and bank performance. Considering the above differing positions, the existence and the nature of the effect of capital adequacy on bank performance is still debatable, hence there still exist a controversy over the existence and nature of relationship

between capital adequacy and bank performance. This in my opinion provokes an intellectual burden for further research and examination.

The objective of this paper therefore is to examine the effect of capital adequacy on the performance deposit money banks in Nigeria.

The hypothesis formulated for this research work is as follows;

1.1 Research Hypothesis

Ho capital adequacy ratio does not have effect on the return on asset of banks in Nigeria

Ha capital adequacy ratio does have effect on the return on assets of banks in Nigeria

II. CONCEPTUAL FRAMEWORK, THEORETICAL FRAMEWORK AND EMPIRICAL REVIEW

There are extensive literatures which addresses the impact of capital adequacy on bank performance. Some of the studies identified concepts and principles under laying capital adequacy and banks performance. There are also various views and ideas regarding the above topic and some of these views are discussed below;

2.1 Capital Adequacy

Capital Adequacy Ratio (CAR) also known as *Capital to Risk (Weighted) Assets Ratio* (CRAR), is the ratio of a bank's capital to its risk. National regulators track a bank's CAR to ensure that it can absorb a reasonable amount of loss and complies with statutory Capital requirements. According to the Reserved Bank of New Zealand, 2004 it is a measure of a bank's capital expressed as a percentage of its risk weighted credit exposures. This ratio is used to protect depositors and promote stability and efficiency of financial systems around the world. Two types of capital are measured: tier one capital, which can absorb losses without a bank being required to cease trading, and tier two capital, which can absorb losses in the event of a bank winding-up and so provides a lesser degree of protection to depositors.According to John, et. al., (2013), capital adequacy is a conception that results from the idea of rearranging the existing capital structure of banks in order to restructure the banking industry against widespread distress. Adequate capital creates an opportunity for a better standards in any business establishment. It spurs business exertion and great performance. Adequate capital aids recapitalization in that it emerges to meet the need of individual banks in form of increasing the minimum paid-up capital so that banks can carry out their operation efficiently with their customers. This is a way of correcting the wide spread distress of the banking sector. Recapitalization according to Ochei (2010) is the act of beefing up the long term capital of a bank to the level at least required by the monetary authorities and to ensure the security of shareholders' fund.

2.2 Bank Performance

Performance may be defined as the execution, achievement, or accomplishment of specific activities (Business dictionary.com,). Bank performance reflects the way in which the resources of banks are used to achieve its objectives. It is the adoption of a set of indicators which are measures of the bank's current status, effectiveness and efficiency (Reserve bank of India 2014). Bank performance demonstrates the efficient use of resources and the ability of a business to make profit (Ben &Mohamed, 2013). It is an assessment of the financial conditions and health of a bank using financial ratios (Torbira & Zaagha, 2016). Hence bank performance is very crucial to the various stakeholders such as depositors, creditors, shareholders, government and managers.

2.3 Theoretical framework

Several theories have been put forward to explain variations in the effect of capital adequacy on performance of various financial institutions. These theories are: Deposit insurance theory which views banks as a portfolio of risky claim, portfolio regulation theory which believes that liquidity and solvency requirements of banks should be made compulsory and not optional by the regulatory authority, expense theory which posits that managers have the option of pursuing policies which maximize their own utility rather than profit maximization for shareholders and buffer theory of capital which postulates that banks may prefer to hold a *'buffer'* of excess capital to reduce the probability of falling under the legal capital requirements, especially if their capital adequacy ratio is very volatile.

This study is however premised on the buffer theory of capital adequacy because it explains why capital adequacy is critical to commercial banks. The buffer theory developed by Calem and Rob (1996) is anchored on the volatility of capital adequacy ratio as well as reliability and dependability on capital for long term planning. It predicts that a bank approaching the regulatory 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 requirement (Ikpefan 2013; Okafor, *et. al,.* 2010).

2.4 Empirical Review

Several studies have been conducted on the effect of capital adequacy and banks performance both in developed and developing countries. For instance Onaolapo and Olufemi (2012) examined capital adequacy and profitability of banking firm in Nigerian. The study focuses on how capital adequacy ratio affects bank performance using ordinary least square (OLS) estimation technique. Findings reveals that Capital Adequacy Ratio does not have significant effect on bank performance

Ini and Eze (2018) investigated the effect of capital adequacy ratio and bank's performance in Nigeria. The study used secondary data and the data was analyzed using the Ordinary Least Squares (OLS) regression method. The result showed

that capital adequacy has significant positive relationship with on Return on Asset.

Okafor, et. al., (2010) studied the effect of capital adequacy on Banks' performance. The study used secondary data to analyze the impact of banks capital adequacy on earnings and profitability of banks in Nigeria using panel data of sample 10 strong and 10 weak banks. The study used Least Square Dummy Variables (LSDV) model to estimates the variables. Findings showed that bank earnings was invariants to capital adequacy.

Ikpefan (2013) examined Capital Adequacy Management and Performance in the Nigerian Commercial Banksbetween1986-2006. The study used panel data obtain from the Central Bank of Nigeria (CBN), financial statement and annual reports of the sample banks. Using ordinary least square regression method to analyze the formulated models, findings indicated that capital adequacy of banks has negative impact on the return on assets.

John and Oke (2013) studied the impact of capital adequacy standards, Basel Accord on the performance of the Nigerians Banks from 2003-2007. The study applied Ordinary Least Square (OLS) estimation technique to analyze the data andthe study showed that capital adequacy exert a major positive influence on bank performance.

Ndifon and Ubana (2014) assessed the impact of capital adequacy on Deposit Money Banks' profitability in Nigeria, taking a case study of five selected banks. The study adopted the Engle and Granger two steps procedure in co-integration. The study revealed that capital adequacy plays an important role in explaining banks Returns on Asset

III. RESEARCH METHOD

The study utilized panel data comprising of nine cross sectional units for a period of 12 years. The model specification for the study takes the form of linear panel specification in line with Olalekan and Adeyinka (2013) and Obiakor (2016). The model is specified as follows;

ROA = f(CAR, DAR, SBN)

Restating the variables above in explicit form, we can represent the model as follows;
$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 DAR_{it} + \beta_3 SBN_{it} + \mu_{it}$

$\mu_{it} = \mu_{it} + \mu_{it} + e_{it}$

Where;
β_0, = the intercept, (the constant term)

β_1, β_2 are the various slope of the coefficient or the parameters to be estimated.

The apriori expectation = β_1, and $\beta_2 > 0$

ROA=Return on asset

SBN = Shareholder equity to branch network

CAR = Capital adequacy ratio

DAR = Deposit asset ratio

μ_{it}= error term.

μ_i = cross sectional element

μ_t= time series element

3.1 Population and Sample of Study

The population size for this study is made of all the twenty one deposit money banks quoted on the Nigerian stock exchange (NSE) as at 31 December 2016 while the sample size comprises of nine banks covering 2005 to 2016. The total observation for this study is made up of 108 observations which is in line with the work of Obiakor R (2015). The banks considered for the study were Access bank, Diamond bank, Ecobank, First bank, Guarantee trust bank, Union bank, United bank for Africa, Wema bank and Zenith bank.

3.2 Source of Data Collection and Estimation Technique

This study relied on annual report of sampled banks, data obtained from Nigerian stock exchange fact books, Internet and website of commercial banks .The data was specifically collected on shareholder funds, total assets, total deposit, branch network and profit after tax of the deposit money banks. The data were analyzed via Stata 2014 statistical package.

IV. DATA ANALYSIS, RESULT AND DISCUSSION

Table 4.1: Results of Descriptive Statistics on the Variables Used for the Study

	CAR	DAR	ROA	SBN
Mean	0.198913	1.095791	0.018094	486.9546
Median	0.150579	0.725938	0.018765	438.2359
Maximum	2.332500	13.18943	0.314802	2064.580
Minimum	-0.318652	-0.145285	-0.447912	-793.4375
Std. Dev.	0.287950	1.702498	0.073388	438.4493
Skewness	4.555153	5.299182	-2.160360	0.673936
Kurtosis	31.35898	33.13709	23.04482	4.648198
Jarque-Bera	3992.532	4592.562	1892.086	20.39992
Probability	0.000000	0.000000	0.000000	0.000037
Observations	108	108	108	108

Note: CAR = capital adequacy ratio, ROA = return on assets, DAR= deposit to total assets ratio,

Source: Field Study, 2018 using STATA 14.

From table 4.1, it was observed that all the data have a positive mean value which means that the variables exhibited an increasing tendencies in the sampling period. The results also revealed that the mean value for ROA is 0.01894. This means that the average financial performance of deposit money banks in Nigeria during the post-consolidation era in terms of ROA was 1.8%. This shows that for every ₦1 worth of asset invested in the sampled banks, an average net

earnings of ₦1.80kobo accrues to them. The maximum ROA of 0.314302 was recorded by Zenith Bank in 2011 while the minimum ROA of (0.447912) was recorded by WEMA Bank in 2009. The average capital adequacy ratio CAR during this era was 0.198913 with maximum and minimum capital adequacy ratio being 2.332500 and (0.318652) respectively. This indicates that the average capital adequacy ratio during the post-consolidation era was 19.89% which is above the current regulatory value of 15% for internationally active banks. The minimum capital adequacy of (0.318652) shows that some banks are still undercapitalized. The mean value of DAR was 1.095791 0.911674 with maximum and minimum being 13.18943 and (0.145285) respectively. The average DAR of 109% shows that more than hundred percent of total assets of deposit money banks during this period was being funded by customer's deposits rather than by equity or borrowed funds. It also means that the market power of banks and their ability to attract customers was very high. This shows that banks at this period was very vulnerable and highly dependent on customers' deposits. From the Table also it was observed that standard deviation which shows the degree of volatility was a very low in ROA, but high in the other variables. This means that apart from ROA, there is a big difference among banks in terms of other variables. The table also showed that CAR and DAR were positively skewed to the right which shows that the bulk of their data moved towards the right while ROA was negatively skewed to the left. This also shows that the data for CAR and DAR was asymmetric to the right while the rest was asymmetric to the left. The kurtosis which shows the peakness of the distribution indicated that all the variables were leptokurtic because all the values were greater than 3.0. It was also observed that the probability of Jargue-Bera statistics of all the variables computed is less than 5% (0.05), therefore we conclude that all the variables are significantly related.

Data Analysis

The study examined the effects of capital adequacy ratio on the performance of banks in Nigerian. The variables were estimated using the pool regression Model. This decision was arrived at after testing between the Pooled Regression and Random Effects to arrive at the most adequate among them. The Breusch and Pagan Lagrangian Multiplier test was used to test the Random Effects model against the Pooled Regression. The pooled regressions model was selected since it emerged as the most appropriate (See Appendix 1).

Test for Unit root

This test is conducted to ensure that panel data used is stationary. This is because regression results conducted, where the series is not stationary may be spurious because the estimated parameters would be inconsistent. The researcher conducted the Unit Root test using Levin-Lin-Chu test to check for data stationality and result shows that data were stationary at I(1) difference.

Table 4.2: Results of the Unit Root Test on Return on Asset, Return to equity, Capital adequacy ratio, Debt to Assets, shareholders to branch network ratio

Variable	t –Statistics	P-Value
ROA	-3.7280*	0.000
ROE	-5.7788*	0.000
CAR	-2.3984*	0.008
DAR	-2.4053*	0.000
SBN	-7.4741*	0.000

Source: Field Study, 2018 using STATA14

The results of the Unit Root test presented in table 4.2, showed the Levin-Lin & Chu (LLC) statistics with their corresponding P-values. The test was conducted using the Akaike information criteria at lag 1. Result showed that the probability value in reference to each variable is smaller than the alpha value at 1%. Thus, the null hypothesis that the panel contains a unit root is rejected at 1% level of significance. Thus, all the specified variables (that is, roa, roe, car dar sbn.) are I (1) variables. Based on the Unit Root test, these variables would yield plausible regression output.

Table 4.3: Results of pool regression analysis on the Relationship between Capital adequacy Indicators and Return on Asset

Variables	Coefficient	Std Error	Z Stat	P-value (z)
Car	0.202033*	0.0284	7.11	0.000
dar	-0.10559*	0.0463	-2.28	0.023
sbn	0.00002 *	0.0001	2.23	0.026
Constant	-0.023976*	0.0081	-2.96	0.003
$R^2 = 0.4902$				
rho = 0.0000				
Wald X^2 (lag 3) =	99.99*			0.000

Note: The dependent variable is ROA (return on assets) * = means significant at 1%, ** = means significant at 5%, *** = means significant at 10%, the independent variables are CAR = capital adequacy ratio, DAR =deposit to total assets ratio, SBN= shareholders fund to branch network, rho = correlation coefficient between the cross-sectional units, R^2 = Coefficient of determination.

Source: Field Study, 2018 using STATA Window 14.

Looking at table 4.3above which revealed the pool regression result showing the relationship between ROA and the independent variables which are CAR, DAR, and SBN. The results showed that CAR, DAR, and SBN have coefficients of 0.202033, -0.105594 and 0.0000276 respectively. There probability values also shows that CAR, DAR, and SBN have 0.0000, 0.023, and 0.026 which showed that both CAR and SBN have positive significant relationship with the dependent variable ROA, while DAR has significant negative relationship with ROA.The result also showed that for every 1 unit change in capital adequacy ratio, (CAR) there will about 20% change in the dependent variable ROA. It further revealed that for every 1 unit change in deposit asset ratio, (DAR) there will be an 11% change in the explained variable.The R^2 at 0.4902 shows that the independent variables jointly influences ROA to the tune of 50% which indicates overall strong relationship. The rho statistic (which is a test for the presence of first order serial correlation) with value 0.0000 indicates that the data series are positively correlated.

Decision: The values of Wald X^2(lag 3) at 99.99 with a corresponding P value of 0.000 indicates the significance of our estimates at 5%. Since the P value (0.000) is less than the critical alpha value at 5%, the null hypothesis is rejected and the alternative which states that banks capital adequacy ratio do have significant influence on return on assets is accepted.

My equation will thus be represented;

ROA= -0.02397 + 0.202033CAR- 0.105594DAR +0.00003SBN

(0.003)*   (0.0000)*   (0.023)* (0.026)*

Figures in () represents the standard error while * means 1% significant level, ** means 5% sl, *** means 10% significant level and **** means above 10% sl

V. CONCLUSION AND RECOMMENDATIONS

The empirical result of the study shows that banks capital adequacy has a significant positive impact on banks profitability in Nigeria. 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 study therefore concludes that capital adequacy improves performance of Nigeria deposit money banks.

The results of the study is consistent with the findings of Ini and Eze (2018) , John and Oke (2013) , and Ndifon and Ubana (2014) who all concluded that there exist a positive significant impact of capital adequacy on banks' performance.

Based on the findings, the researcher recommended that:

1. There should be a continuous monitoring of deposit money banks in line with capital adequacy requirement for optimal performance.
2. Nigeria banks should be well capitalized to enable them enjoy assess to cheaper sources of funds with subsequent improvements in profit levels. This would go a long way to help the public to maintain confidence in banks and also accommodate the credit needs of customers.

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APENDIX 1 TESTING BETWEEN RANDOM FIXED AND POOL REGRESSION.

. xtset bank year

 panel variable: bank (strongly balanced)

 time variable: year, 2005 to 2016

  delta: 1 unit

. xtreg roa car dar sbn,re

Random-effects GLS regression Number of obs = 108

Group variable: bank Number of groups = 9

R-sq: Obs per group:

 within = 0.3571   min = 12

 between = 0.9415   avg = 12.0

 overall = 0.4902   max = 12

   Wald chi2(3) = 99.99

corr(u_i, X) = 0 (assumed) Prob > chi2 = 0.0000

```
------------------------------------------------------------------------------
    roa |    Coef.    Std. Err.    z     P>|z|    [95% Conf. Interval]
------------+-----------------------------------------------------------------
    car |  .202033   .028404    7.11  0.000   .1463622  .2577039
    dar | -.0105594  .0046298  -2.28  0.023   -.0196337 -.0014851
    sbn |  .0000276  .0000124   2.23  0.026   3.33e-06  .0000519
  _cons | -.0239768  .0080896  -2.96  0.003   -.0398321 -.0081215
------------+-----------------------------------------------------------------
 sigma_u |      0
 sigma_e | .05438472
    rho |      0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

roa[bank,t] = Xb + u[bank] + e[bank,t]

Estimated results:

```
       |    Var    sd = sqrt(Var)
---------+---------------------------
   roa |  .0053858     .073388
     e |  .0029577    .0543847
     u |     0           0
```

Test: Var(u) = 0

           chibar2(01) =   0.00

          Prob > chibar2 =   1.0000