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## **Empirical Assessment on Financial Regulations and Banking Sector Performance**

**Abstract:** This study examines financial regulation and banking sector performance in Nigeria. Specifically, the study determines the impact of reforms on banking sector performance and also assesses the nexus between capital adequacy and banking sector performance. Time series data for the period 1993 to 2014 was used. As an analytical tool, the study uses unit root test to determine the stationary state of the variables. We also employed the Johansson co-integration and error correction model (ECM) statistical techniques to establish both short-run and long-run dynamic relationships between the endogenous and exogenous variables. The empirical findings indicate that financial regulation significantly impacts the banking sector performance while financial regulation has both short-run and long-run dynamic relationships with the banking sector performance in Nigeria. It was found that the four-period lag of capital adequacy negatively affects banking sector performance and is not statistically significant. The paper suggests that the Central Bank of Nigeria (CBN) should continually make public the impacts that the various financial regulations and reforms have on the performance of Nigerian banks. Majority of the policies on financial regulation by the apex bank (CBN) need to be long-run which can enable confidence of stakeholders, shareholders and the general public in the Nigerian banking industry when critically evaluated.

**Keywords:** Financial regulations, capital adequacy, bank size, monetary policy rate, reform, performance.

**JEL Classification:** G20

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## Introduction

The banking sector is a segment of the financial system that primarily engages in financial intermediation and extension of credit facilities to creditworthy customers on short or long-term basis. The banking sector in Nigeria has no doubt witnessed some financial regulations and developments. The series of financial regulations and reforms witnessed in Nigeria occurred due to certain unhealthy factors and specifically because of the need to strengthen the banking sector. In the pre and post-colonial days in Nigeria, banks suffered a lot of setbacks and eventually collapsed due to mismanagement, inexperience, unhealthy banking practices, non-adherence to ethical standards on the part of the management, poor asset quality, under capitalization, and to a very large extent, absence as well as inadequate financial regulation and supervision. As a result of these ills in the banking sector then, there was a need to financially regulate the sector to ensure its optimal performance..

Financial regulation particularly in the banking sector is the sole responsibility of the CBN and inclusively the Nigerian Deposit Insurance Corporation (NDIC). The CBN's active involvement in financial regulation of the banking sector is primarily designed to protect depositors' funds, strengthen the banks against internal and external shocks as well as promote financial stability with a view to influencing the performance of the financial sector and the overall improvement of the economy. Intuitively, adequate regulation of the banking sector by CBN could be seen as an all-encompassing role given the fact that the banking industry serves as the engine and driver of every sector of the economy. For instance, in the economic theory of regulation, it is a common notion that the essence of financial regulation is to prevent market failure. Prevention of market failure presupposes that proper regulation and policy framework is put in place by the apex bank – the Central bank. Furthermore, financial regulations are meant to engender low risks exposure by banks and maintain resilience. Banking sector development may be difficult to attain without deliberate, conscious and radical financial regulations, regulatory processes and regulatory framework by the Central bank. In this regard, the goal of financial regulation should be to improve the overall performance of banks so as to enable these banks compete favourably among their counterparts internationally. If a bank is unduly exposed, for example, to capital and liquidity risks, the wealth of the shareholders no doubt will be negatively affected. To safe guide against this, the CBN comes with perceived favourable regulatory policy through reforms and other methods to address it. Thus, financial regulations in Nigeria entail a series of reforms which can be traced back to as early as the 1950s while reforms also occurred in the 1990s and

a major shakeup of the Nigerian banking sector took place in between 1999 and 2003 while other phases of reforms are still taking place (Omankhanlen, 2012)

Each of these phases came with its specific objectives and attendant benefits and also its adverse effect both at the micro and macro levels. Financial regulation has its attendant positive effects on banking operations and performance. For instance, while the implementation of financial regulations strengthened the Nigerian banks, it also created the propensity to enhance foreign and local investors' confidence and made them willing to carry out numerous financial transactions with banks and consequently invest in the economy. Such investment in the economy promoted economic growth through sustained rise in the value of economic activities for a defined period of time. So, to what extent does these series of regulations impact the financial performance of banks in the Nigerian financial sector is a question this study seeks to address. The interface between financial regulations and banking sector performance has not gained ascendancy in Nigeria and there is paucity of empirical literature on this subject matter. Hence, this study is undertaken so as to contribute to the literature in this area.

## 2. Theoretical framework of study

This study relies on the normative theory of financial regulation as developed by Wittman (1977). The normative theory of regulation conceptualizes that regulators should encourage healthy competition where practicable and minimize the costs of information asymmetry by obtaining information and thereafter providing operators with needful incentives to improve their business performance. Also, it is proposed that financial regulators should further provide a viable price structure that can improve economic efficiency and establish regulatory systems that are in tune with transparency, predictability, legitimacy, and credibility of such a regulatory process. Thus, Wittman argues that normative theory of regulation ensures a cost-benefit analysis of various regulatory instruments employed by monetary authorities. The term 'regulation' may be interchangeably used as 'reform'. Broadly speaking, reforms have emerged in response to the challenges occurring in the financial systems worldwide such as systemic crisis, globalization, technological innovations and the global financial crisis. Notably, the financial sector comprises of the banking sector, capital markets and non-bank financial institutions. As for goals, the aim of the financial sector in any industry is to increase monetary management, risk management and asset holding capacities of corporate institutions. As noted by Omankhanlen (2012), "reforms often seek to act proactively to strengthen the financial system, prevent systemic crisis, strengthen market mechanisms and instils ethical standards".

In Nigeria, financial sector reforms have been especially notable in the banking sector. Examples of some of these reforms include bank recapitalization, stoppage of universal banking, emergent of e-banking, introduction of cashless policy, bank verification number (BVN), a reduction of the tenure of bank MDs/CEOs, a separation of the dual roles of bank MDs/CEOs. Further policy reforms were also in the area of the introduction of asset management companies saddled with the role of buying toxic assets of banks to relieve them of non-performing loans with a view to improving their liquidity. Specifically, the primary purpose of financial regulations or reforms was to increase the productive base of the economy, enhance credit allocation to the private sector, access to credit and strengthen banks' capital base to absorb both internal and external shocks as well as engender increase in shareholders' wealth and the reduction of the social costs of bank failure to the economy.

As such, there have been several reforms and financial regulations put in place to positively sharpen the Nigerian banking sector operations and performance. According to Shittu (2012), reforms introduced into the banking system in Nigeria have brought about a new mindset to the industry as banks are putting in place best practices in the areas of corporate governance and risk management. Further, transparency and public disclosure of transactions have remarkably improved. Thus, Nigerian banking institutions are products of revised regulations and reforms. Prior to the advent of re-capitalization reforms in Nigeria, many banks collapsed due to a myriad of factors. As a result of public dissatisfaction and lack of confidence in the Nigerian banks, there was the need to ameliorate the woes that constantly bedevilled the banking industry. This led the CBN to come up with several policy reforms geared towards regulating the operation of banks with aims to ensure best practices are observed and also make banks compete favourably with their international counterparts. Another area that financial regulations have occurred in the banking sector is the use of monetary policy to influence interest rates by the CBN. The aim was to encourage accessibility to finance by deficit units in the short run. Theoretically, higher access to money for investment purpose influences bank earnings and consequently their financial performance. So there is always a need to enhance capital adequacy which is one of the key drivers of financial regulations. This is because capital adequacy of financial institutions to a large extent affects their lending power. This is why when there was capital inadequacy of many banks in the country, they were faced with high cost of financial distress which affected profitability (Olalekan and Adeyinka, 2013). In other words, the effect of capital adequacy on banking sector performance cannot be underestimated since adequate capital directly and automatically influences the amount of funds available for loans, which invariably affects the level and degree of risk absorption (Ezike, 2013).

## 2.1 Capital adequacy and banking sector performance

One of the significant regulatory policies that have positively contributed to banking sector performance in Nigeria was the 2005/2006 bank consolidation that required banks to maintain a minimum of twenty billion naira capital base. The purpose was to ensure banks have capital adequacy. Some banks were able to meet up with this due to their huge financial strength while those that could not meet up were forced to embrace mergers and acquisition schemes. This led to the decrease of the number of banks in Nigeria from 87 to 25 banks. As noted by Andabai (2010), these consolidations brought about changes in the size, structure and operational characteristics of the Nigerian banking system. This was also regarded as one of the biggest achievements in the financial sector of the Nigerian economy since the upward review of the capital base of banks resulted in bigger, stronger and more resilient financial institutions. Thus, capital adequacy is regarded as the percentage ratio of a financial institution's primary capital to its assets (e.g. loans and investments) and used as a measure of financial strength and stability of such financial organisations (Olalekan and Adeyinka, 2013).

In a quantitative study, Ezike (2013) empirically examined capital adequacy standards and performance in the Nigerian banking sector. The findings showed that capital adequacy standards exert a major influence on bank performances. Additionally, Rose and Hudgins (2005) suggested that recapitalization may raise liquidity in short term but does not guarantee conducive macroeconomic environment needed to ensure good profitability and high asset quality. Therefore, profitability and asset base are the two traditional measures used to gauge bank performance in Nigeria. In essence, profitability will always please shareholders while having a large asset base will satisfy the board of directors (Javaid, Anwar, Zaman and Ghafoor, 2011).

## 3. Methodology

A longitudinal research design was adopted in this study while the population size used was the entire banking sector of Nigeria. The period of study was from 1993-2014. Thus, annual data set for the period was extracted from the Central Bank of Nigeria Statistical Bulletin issues and used for the econometric analysis. The choice of this period is based on the fact that several banking reforms and financial regulations were made within this period by the monetary authority in Nigeria to reposition the banking sector. The statistical technique employed in this study includes the error correction model (ECM) and Ordinary Least

Squares (OLS) multivariate regression to establish both the short-run and long-run relationships between the variables and also determine how the independent variables impact on the dependent variable. Aguwamba, Ogbefun, and Ekienabor, (2016) used a similar design in their study to examine the presence or absence of long-run relationships among the variables they empirically tested and this method was found viable. The following are the model specifications and analysis done in this study.

### 3.1 Model Specification

The model employed in this study is stated in deterministic form as:

$$ROE = F(CAD, SIZE, INTR, REF) \quad (1)$$

Equation (1) is expressed in its econometric form as follows:

$$\Delta ROE_{it} = \beta_0 + \beta_1 \Delta CAD_{it-i} + \beta_2 \Delta SIZE_{it-i} + \beta_3 \Delta MPR_{it-i} + \beta_4 \Delta REF_{it-i} + \lambda ECM_{t-1} + \varepsilon_t \quad (2)$$

Where:

$\Delta$  represents changes in each of the variables employed in the construct above

ROE = return on equity

CAD = capital base/ adequacy

SIZE = Industry size, proxied using total number of banks

MPR = monetary policy rate

REF = banking sector reform, it is a dummy variable of one (1) in the period banking reform occurs and zero (0) in the period banking reform never occurred.

$\varepsilon_t$  = Stochastic error term.

t = represents the time period

i = is a subscript for all the individual banks

$\beta_0$  = the intercept term

An apriori expectation in this study is  $\beta_1 - \beta_{4.>0}$ . This portends that the set of the explanatory variables are expected to positively engender banking sector performance.

## 4. Empirical analysis

This section is concerned with the analysis and interpretation of data generated from secondary sources. It contains the result of unit root tests, diagnostic test and also establish the long-run and short-run dynamic relationships between the endogenous variable and exogenous variables. Thus, the results are presented sequentially as follows:

**Table 1: Unit root test at level**

Variables	ADF statistic value	Test critical value at 5%	Meaning
ROE	-3.292114	-3.710482	Not stationary
CAD	-3.353818	-3.658446	Not stationary
SIZE	-2.026078	-3.644963	Not stationary
MPR	-3.626857	-3.658446	Not stationary
REF	-1.544025	-3.644963	Not stationary

**Table 2: Unit root test at first difference**

Variables	ADF statistic value	Test critical value at 5%	Meaning
ROE	-3.921229	-3.020686	Stationary
CAD	-5.035274	-3.029970	Stationary
SIZE	-4.272375	-3.020686	Stationary
MPR	-6.209573	-3.29970	Stationary
REF	-4.472136	-3.020686	Stationary

Source: Computed from E-view 8.0 (2016)

The unit root test results show that at level, the null hypothesis is not accepted, but at first difference, it can be observed that the variables were stationary at 5% significant level. This is so given that ADF test statistic is greater than test critical value at 5% level. It simply indicates there is no likelihood of occurrence of or obtaining spurious regression result.

**Table 3: Diagnostic tests**

Variance inflation factors (VIFs)		
CAD	0.000181	5.211232
SIZE	0.418750	7.136975
MPR	14.42248	1.777114
REF	745.8956	2.056530
Breusch – Godfrey – serial correlation LM test		
F-statistic = 0.316418	Prob. F(2, 9)	0.7365
Obs * R-squared = 1.116828		Pro. Chi-square (2) 0.5721
Heteroskedasticity test Harvey		
F-statistic 2.913026	Prob. F(4, 12)	0.0675
Obs * R-squared 8.374974	Prob. Chi-square 0.0788	0.0788
Ramsey Reset Test		
t-statistic = 5.316354	Df = 10	0.0003
F-statistic = 28.26362	Prob. F(1, 10)	0.0003

Source: Researchers' compilation from Eview 8.0 (2016)

The diagnostic table above shows that the variance inflation factor statistic is less than 10 (centered  $vif < 10$ ) for each of the variables. This indicates absence of multicollinearity among the explanatory variables. The ARCH (Harvey) Heteroskedasticity test shows the presence of homoscedasticity ( $0.07885 > 0.05$ ), thus confirming the constant variance assumption of the ordinary least square estimator. The Breusch-Godfrey serial correlation LM test result of  $0.5721 > 0.05$  points out the absence of higher order correlation. The Ramsey Reset Test result of ( $0.003 > 0.05$ ) substantiate validity of the regression model.

#### Long-run impact of financial regulation on banking sector performance

$$\begin{aligned}
 ROE = & 99.659C + 0.001 CAD + 0.639513E - 2.655MPR - 46.567REF \\
 & (1.636) \quad (-0.124) \quad (0.988) \quad (-0.699) \quad (-1.705) \\
 & (0.130) \quad (0.903) \quad (0.344) \quad (0.499) \quad (0.116)
 \end{aligned}$$

R-squared = 0.621

Adjusted R-squared = 0.449

F-statistic = 3.612

Prob (f-statistic) = 0.035

Durbin Watson statistic = 1.474



The regression equation above shows that the R-squared is 0.621; meaning that the explanatory variables account for about 62% systematic variation in the dependent variable, return on equity (ROE) in the Nigerian banking sector, leaving the other percentage unaccounted for due to stochastic error term. After adjusting for the degree of freedom, the model accounts for about 44% systematic variation in the dependent variable, ROE. The coefficient of determination is however weak in that it is less than average. The F-statistic value of 3.612 compared with the Prob (F-statistic value) of 0.035 is statistically significant thus connoting that the independent variable in the long-run jointly impacts the banking sector performance in Nigeria. The coefficient of the explanatory variables shows that a unit change in capital adequacy (CAD) impacts negatively banking sector performance with 0.001 units and is not statistically significant at 5% level. A unit change in size is observed to positively increase banking sector performance; with a value of 0.639 units and is not statistically significant at 5% level. A unit change in monetary policy rate (MPR) from the regression equation above reveals that it reduces banking sector performance with a value of 2.655 units and is not statistically significant at 5% level. Similarly, a unit change in reform shows that it adversely impacts banking sector performance and is not statistically significant at 5% level. The Durbin-Watson value of 1.50 is an indication of absence of serial correlation in the regression. It can be concluded here that the result is generally useful for policy prescription.

**Table 4: Co-integration Analysis**  
Unrestricted Co-integration rank test (Trace)

Null hypothesis	Trace statistics	Critical value at 5%	Maximum Eigenvalue	Critical values at 5%
R = 0	94.839	69.818	38.991	33.876
R ≤ 1	55.847	47.856	28.688	27.584
R ≤ 2	27.159	29.79	16.636	21.131
R ≤ 3	10.522	15.494	8.348	14.264
R ≤ 4	2.17	3.841	2.17	3.841

The trace statistic values compared against the critical values indicate that there are at least 2 co-integration vectors (Johansen, 1988). The maximum Eigen value statistics points out that there are also at least 2 co-integrating equations. Usually, the maximum Eigen value is used as a basis of establishing the long-run co-integration between variables. Therefore, the result indicates that there is a long-run relationship between financial regulation and banking sector performance in Nigeria.

**Table 5: The parsimonious error correction model****Dependent variable: ROE**

Variables	Coefficient	Standard error	t-statistic	Prob
C	-8.903	5.688	-1.565	0.161
DCAD(-4)	-0.002	0.009	-0.229	0.824
CAD	0.006	-0.007	0.850	0.423
DMPR(-2)	-3.752	1.773	-2.116	0.072
DMPR	-2.703	2.498	-1.082	0.315
DSIZE(-1)	-0.010	0.303	-0.036	0.972
DSIZE	-0.010	0.474	-0.022	0.982
DREF(-2)	22.287	28.107	0.792	0.453
DREF	29.747	29.883	0.995	0.352
ECM(-1)	-0.305	0.224	-1.250	0.051
R-squared = 0.635			Prob (f-statistic) = 0.052	
Adjusted R-squared = 0.566			Durbin Watson statistic = 2.026	
F-statistic = 1.355				

The error correction estimates in the above table reveal that the error correction term or speed of adjustment coefficient for the equation is properly signed with the expected negative sign. It suggests that there is a tendency by the model to correct and quickly move towards the equilibrium path following any occurrence of disequilibrium in each period. This portends that meaningful error correction is taking place. Meanwhile, the ECM equation accounts for the correction of about 30.5% of the error generated in the past period. Similarly, from the value of the t-statistic compared with the p-value, the error term's coefficient is statistically significant. This clearly underscores the fact that short-run dynamic relationship exists between financial regulation and banking sector performance in Nigeria.

After adjusting for the degree of freedom, the R<sup>2</sup> bar points out that all the explanatory variables were able to explain short-run systematic variation in banking sector performance with about 56.6%; leaving the other percentage unexplained because of the stochastic error term acting as a surrogate in the model. The f-statistic as can be observed from the regression table above is statistically significant at 5% level. This indeed reveals the goodness of fit of the model. The individual coefficient of the explanatory variables shows that four-period lag of capital adequacy DCAD(-4) negatively affects banking sector performance and is not statistically significant at 5% level, while the current value of capital adequacy (CAD) positively influences banking sector performance, though is not statistically significant at 5% level. Both the current value of MPR and its two-period lag reduce the return on equity (ROE) of the banking sector and were not

statistically significant at 5% levels. In the same vein the current value of size and its one-period lag negatively affect the return on equity (ROE) of the Nigerian banking sector and were not statistically significant at the 5% levels. The current value of reform (REF) and the two-period lag (DREF (-2)) were observed to increase the banking sector performance (ROE) in the short-run, though were not statistically significant at the 5% levels. The Durbin Watson statistic value of 2.026 is approximately 2, and it shows the absence of serial autocorrelation in the result. In a nutshell, the study finding is that financial regulation has short-run relationship with banking sector performance in Nigeria. In addition, the results show that financial regulation has negative impact on banking sector financial performance in the short-run.

## 5. Discussion of findings

The relationship between financial regulation and banking sector performance has not gained ascendancy in Nigeria. Hence, this paper empirically examines the subject matter and contributes to the literature. The result obtained show that financial regulation has a negative impact on banking sector performance in the short in Nigeria. This suggests that the apex bank has to cautiously draft policies regulating the banking sector so that it can perform optimally. This of course should reduce systemic risk, influence other sectors of the economy and stabilize investors' confidence. Since regulatory policies have negative impact on the sector's performance, care should be exercised by the regulators in ensuring that such policies do not affect the long-run performance of the sector in order not to jeopardize the future prospect and stability of the sector. Short-term regulatory policies are required by the apex bank to regulate these financial activities. This is so given that every regime of government coming into power differs in terms of policy initiatives in addition with the unexpected influence of micro and macro-economic factors that interplay to cause instability to the banking sector. Short-term forward looking policies rather than long-term regulations are primarily the panaceas to stemming the uneasy negative occurrences that tend to disrupt financial regulation in Nigeria. This is not enough as the CBN must constantly employ a model to examine the extent of policy reforms and financial regulations impacting the banking sector. The finding obtained in this regard is consistent with studies of Igbinsola and Ogbeide, (2016), Omankhanlen (2012), Imad, Qais and Thair, (2011) and somewhat in tandem with Fadare (2010).

From the study, it was also revealed that capital adequacy in the period observed did not yield positive impact on banking sector performance. This to an extent affirms the view of stakeholders on the need for further re-consolidation of Nigeri-

an banks, perhaps to enhance efficiency and reduce internal and external shocks. Further, bank size was found to have negative relationship with return on equity in the short-run. It is argued that size either in terms of the number of banks or total assets should have a positive effect on banks' earnings. As such, the apex bank has to exercise caution with policies that bother on reforms and financial regulation to avoid over competition and other unhealthy inter-banking relationship. For example, too much investment in total assets without a corresponding positive returns no doubt signals waste of resources and depletion of shareholders wealth in the banking sector. The view expressed here is not dissimilar to Enendu et al's (2013) findings that suggest the bigger doesn't necessarily mean the better in terms of bank profitability but cost and managerial efficiency as well as productivity suffices as better measurements. Therefore, CBN needs to exercise caution in order to reduce the high cost of regulation borne by banks. Indeed such regulations must be in beneficial to the economy and the country as a whole.

## 6. Conclusion and recommendations

Financial regulation will continually be on the front burner in an attempt by the apex bank, the Central Bank of Nigeria, to strengthen the banking sector and ensure its development. The framework of financial regulation differs from country to country. As events unfold, various policies are made to fast track a particular objective by the regulators of the banking sector. But the extent to which policy on reforms and financial regulations impact on banking sector performance with the use of empirical model appears lacking. The investigation reveals that reforms impact the performance of banks negatively. However, such impact is not statistically significant. The various proxies for financial regulation have not impacted positively and significantly the banking sector performance in Nigeria. Although both long-run and short-run relationships exist between financial regulation and banking sector performance, the study concludes by stating that the regulators of the Nigerian banking sector need to constantly undertake a cost-benefits analysis to ensure that the high cost of regulation borne by banks is weighed against the overall benefits of such regulations to the entire economy of the nation. The paper suggests that the Central Bank of Nigeria should continually make public the impact that the various financial regulations and reforms have on the performance of Nigerian banks. Majority of the policies on financial regulation by the apex bank need to be long-run and accessible for critical evaluation by stakeholders, shareholders and the general public.

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