

# Capital Adequacy and Banking Performance in a Post – Consolidation Era: A Study of Selected Nigerian Banks

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## Abstract

This research study was conducted on capital adequacy and banking performance, its opportunities and challenges for Nigeria Economic Development. The study examined how the banking sector performed a decade after the 2005 banking recapitalization, the problems associated with the profitability and efficiency of banks. The study utilized regression using E-views statistical package. The Durbin Watson statistics indicated that the successive error terms are close to one another on the average. This means that there is positive serial correlation. The Akaike and Schwarz criteria criterion shows that the difference between the two is very negligible, an indicator of a near perfect model convergence near zero. The correlation coefficient  $R^2$  for each of the banks studied indicated that most of the variations in the dependent variables were explained in the independent variable. The model's goodness of fit adjudged reliable. It became apparent from the findings that the banking sector reforms in 2005 significantly impacted on the lending rates, deposits and profitability. The study recommends that various macroeconomic and institutional problems facing the Nigerian economy, which include inappropriate macroeconomic policies, inadequate policy coordination, social -political instability, high cost of doing business and multiple taxes and levies should be tackled with new bank reforms to increase capital and reduce undue risks.

**Keywords:** Capital Adequacy, banking performance, post-recapitalization era and Nigerian banks

## 1. Introduction

There are many studies in similar researches about the relationship between the adequacy of bank capital and the performance of banks in the sector. In the Nigerian banking sector there has been various attempts by the regulators to increase the minimum capital of banks over the years but none more revolutionary in size and complexity than the 2005 reforms by the Central Bank of Nigeria (CBN). In 2005 the CBN put the minimum paid up capital of banks to N25billion (US\$173million) from N2billion (US\$14million). In 2004, the banking industry of Nigeria consisted of 89 banks which after the recapitalization decreased to 25 larger and better capitalized banks. Some of the major considerations for further recapitalization include the quality of banks, establishment of financial stability, enabling healthy financial sector evolution and ensuring the financial sector contributes to real economy.

### 1.1 Brief history of selected banks

There are four banks selected for this study. They are First Bank Plc, Access Bank Plc, Zenith Bank Plc and Guarantee Trust Bank Plc. These banks were considered because of the level of capitalization, market spread and they are quoted companies that have consistently performed well over time at the Stock Market.

#### 1.1.1 First bank ltd

First bank was founded in 1894 as the Bank for British West Africa; it was the First banking institution to be established on African Continent. With over 120 years of its banking history, the bank is considered a significant representation of the industry. It is headquartered in Marina, the heart of Lagos. The bank originally served as the British Shipping and Trading Agencies in Nigeria. The founder, Alfred Lewis Jones was a shipping magnet who originally had a monopoly in importing silver currency into West Africa through his Elder Dempster Shipping Company. After Nigeria independence in 1960, the Bank began to extend more credits to indigenous Nigerians. At the same time citizens began to trust British Bank, since there was an independent financial control mechanism and more citizens began to patronize the Bank of West Africa now known as First Bank Nigeria Plc. It converted to a public company in 1970 and was listed on the NSE in 1971. However, as part of the implementation of the non-operating holding company structure, it was delisted from the stock exchange and replaced with FBN Holdings Plc. in 2012.

#### 1.1.2 Access bank plc

Access bank Plc is a Nigerian multinational commercial bank, owned by Access Bank Group and licensed by the CBN. It is headquartered in Victoria Island, Lagos, and the financial capital of Nigeria. The bank received its license from the CBN in 1989 and was listed in the Nigerian Stock Exchange in 1998. In 2002 the bank was taken over by a core of new management led by Aigboje Aig-Imoukhede and Herbert Wigwe. During the reforms of 2005, the bank acquired Marina Bank and Capital Bank. In 2007, it established a subsidiary in

Gambia. In 2008, there were more acquisitions as the bank consolidated positions with 88% shares of Omnifinance bank, 90% of Banque Privee du Congo, 75% shares of Bancor SA in Rwanda. Also in 2008 there were subsidiaries established at Lusaka, Freetown and London. By 2010 Access Bank had fully acquired the defunct Intercontinental Bank making the bank one of the largest four commercial banks in Nigeria with over 5.7 million customers, 309 branches and 1,600 Automated Teller Machines.

### **1.1.3 Zenith bank plc**

Zenith Bank Plc was established in May 1990, and commenced operations in July of the same year as a commercial bank. The Bank became a public limited company on June 17, 2004 and was listed on the Nigerian Stock Exchange (NSE) on October 21, 2004 following a highly successful Initial Public Offering (IPO). Zenith Bank Plc currently has a shareholder base of about one million and is Nigeria's biggest bank by tier-1 capital. In 2013, the Bank listed \$850 million worth of its shares at \$6.80 each on the London Stock Exchange (LSE).

Headquartered in Lagos, Nigeria, Zenith Bank Plc has more than 350 branches and business offices in prime commercial centers in all states of the federation and the Federal Capital Territory (FCT). In March 2007, Zenith Bank was licensed by the Financial Services Authority (FSA) of the United Kingdom to establish Zenith Bank (UK) Limited as the United Kingdom subsidiary of Zenith Bank Plc. Zenith Bank also has subsidiaries in: Ghana, Zenith Bank (Ghana) Limited; Sierra Leone, Zenith Bank (Sierra Leone) Limited; Gambia, Zenith Bank (Gambia) Limited; UAE, Zenith Bank (UK) Limited - (DIFC Branch). The bank also has representative offices in South Africa and The People's Republic of China. The Bank plans to take the Zenith brand to other African countries as well as the European and Asian markets.

Zenith Bank is one of Nigeria's largest banks. The bank currently has a shareholder base of about one million and is the biggest tier-1 bank in Nigeria. Established in May 1990, it became a public limited company on June 17, 2004 and was listed on the Nigeria Stock Exchange on October 21, 2004. The bank's shares are traded on the London Stock Exchange (LSE) following a listing of the \$850 million worth of its shares at \$6.80 each.

With its headquarters in Lagos, Nigeria, Zenith Bank has more than 350 branches and business offices spread across all states of the Federation and the Federal Capital Territory (FCT), Abuja. Zenith Bank has presence in the United Kingdom, United Arab Emirates, Ghana, Sierra Leone and The Gambia. The Bank also has representative offices in South Africa and China and plans are afoot to take the Zenith franchise to other Sub-African regions as well as the European and Asian markets while consolidating its position as a leading financial service provider in Nigeria and locations where she currently operate.

### **1.1.4 Guaranty Trust Bank Plc**

Guaranty Trust Bank plc also known as GTBank or simply GTB is a Nigerian multinational financial institution, that offers Online/Internet Banking, Retail Banking, Corporate Banking, Investment Banking and Asset Management services, based in Victoria Island, Lagos. Guaranty Trust Bank plc was incorporated as a limited liability company licensed to provide commercial and other banking services to the Nigerian public in 1990 and commenced operations in February 1991. In September 1996, Guaranty Trust Bank plc became a publicly quoted company and won the Nigerian Stock Exchange President's Merit award. In February 2002, the Bank was granted a universal banking license and later appointed a settlement bank by the Central Bank of Nigeria (CBN) in 2003. Guaranty Trust Bank undertook its second share offering in 2004 and raised over N11 billion from Nigerian Investors to expand its operations. On 26 July 2007 GTBank became the very first sub-Saharan bank and first Nigerian joint stock company to be listed on London Stock Exchange and Deutsche Börse. The IPO raised US\$750,000,000. In the same year, they successfully placed Nigeria's first private Eurobond issue on the international capital markets.

The GTBank USD 500,000,000 Eurobond was the first ever Benchmark Eurobond issue by a Nigerian corporate and the second Eurobond programme by GTBank in the last 5 years. The long-term debts of Guaranty Trust Bank plc are rated BB- by Standard & Poor's and AA- by Fitch Ratings, which are the highest ratings for a Nigerian bank. They introduced online banking and SMS banking in Nigeria and a naira denominated MasterCard as well as the *Platinum* and *World Signia* cards and with *GTB-on-wheels*, mobile branches. On 12 March 2008, GTBank was given a banking licence for the United Kingdom by the Financial Services Authority. GTBank is a partner of Eko Atlantic City a new made island (820 ha.) in the Atlantic ocean, adjacent to Victoria Island Lagos. It will be the home of the new Financial District. The building of Eko Atlantic City started in 2009 and is expected to be finished in 2016. To commemorate the bank's 20th anniversary, the Nigerian Postal Service issued a set of GTBank Anniversary postage stamps. This was the first time in Nigeria that a corporate organization was honored in such a way. In 2011, the bank became the biggest bank in Nigeria by market capitalization. In 2013, the Bank issued a USD 400,000,000 Euro bond at a coupon rate of 6%; the least obtained by a Nigerian company in the international capital market. The Eurobond was issued under the USD 2,000,000 Global Medium Term Note Programme, which is registered under both Regulation in the United State of America and Rule 144A in the United Kingdom and sold to investors across Africa, America, Asia and Europe. The Bank has over 10,000 employees.

## 1.2 Statement of problem

The research problems that have necessitated this study include the rampant long systematic distress occasioned by lack of funding, poor management of funds and poor risk assessment leading to low asset quality over the years. The increase in risks to bank deposits as a result of capital inadequacy should be of serious concern to the regulators such as the Central Bank of Nigeria (C.B.N) and Nigerian Deposit Insurance Corporation (N.D.I.C) considering the importance of having robust banks that can grow the economy and compete globally. It is critical to examine the problems mentioned to contribute to policy regarding recapitalization and its effect on bank performance.

## 1.3 Objectives of study

- i. To determine the extent to which the recapitalization reforms in the banking sector have increased banks profitability since 2005
- ii. To ascertain effect of recapitalization reforms on customer deposits since the 2005 reforms
- iii. To examine the influence of recapitalization reforms on lending by commercial banks since 2005.

## 1.4 Research questions

- i. To what extent has recapitalization reform in the banking sector improved banking sector profitability since 2005?
- ii. To what degree have the recapitalization reforms in the banking sector improved customer deposit since 2005?
- iii. How has the recapitalization reforms of the banking sector affected commercial banks lending to the public since 2005?

## 1.5 Research hypotheses

Hypotheses are tentative statements about reality that is either to be accepted, or rejected on the basis of empirical evidence.

H<sub>1</sub>:The 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on the profitability of banks.

H<sub>2</sub>:The 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on customer deposits.

H<sub>3</sub>:The 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on lending.

## 1.6 Significance of study

The significance of the study in this era of increased globalization is of immense importance to academics, investment bankers, economists, and banking sector regulators. The emphasis being to minimize risk and maximize profit to foster banking growth.

## 1.7 Scope of study

The study covers the period of eleven years (2005 -2015) using the annual reports of the four banks under study.

## 2.0 LITERATURE REVIEW

It is common to find banks holding capital in excess of the minimum legal requirements especially when the capital adequacy volatile or less predictable at best. The Central Bank of Nigeria considers it a serious breach when banks fall below the minimum standards of capital adequacy and can withdraw banking licenses where applicable. However, when deposits mobilized are not sufficient measure of capital adequacy, banks can apply for increased equity beyond the minimum bench mark. This need for increased capital by banks is fundamentally essential to prevent erosion of the banks' capital base. Calem and Rob (1996) opined that to avoid regulatory costs caused by poor capitalization, the affected bank would be motivated to reduce risk by boosting capital, this is what they termed "buffer theory". Banking operations suffer from risks posed by capital adequacy, however when bankruptcy is inevitable, the risks are borne by the banks' shareholders, depositors and the Nigerian Deposit Insurance Corporation (NDIC). Peltzman (1970) in supporting the "portfolio theory" stated that supervisory agencies takes measures to compel changes in banks' balance sheet if the banks' asset portfolio is adjudged as too risky or capital inadequate. Nyong (2001) citing Williamson (1963) in support of the "expense theory" otherwise called the "theory of managerial discretion" insists that managers have the option of pursuing policies which maximize their own utility rather than profit maximization for shareholders.

Nwankwo (1991) opined that bank capital in addition to being funds attributed to as equity by the promoters also exist to act as a cushion losses not covered by current earnings and of course to protect depositors and other creditors from losses in case of liquidation. There is no unanimous agreement among scholars as to what constitutes adequate capital. The monetary authorities of different countries have different opinions as to

what constitutes capital adequacy. But by definition scholars are unanimous in agreement that capital adequacy is the amount of capital that can effectively discharge the primary capital function of preventing bank failure by absorbing losses. In course of their operations banks undertake risky lending losses can be incurred which can erode a bank's capital if the amount is insufficient to cushion the effect of losses.

The size and complexity of the economy where the bank operates and the extent of exposure to foreign markets and foreign investors can also affect the performance of banks. A bank in a country with good economic fundamentals is likely to outperform a bank in a market with poor regulations and even poorer practices of liquidity with a higher history of volatile markets. Harward and Upton (1991) in their study of business profits agree that even though profitability is an index for efficiency but is not synonymous with it. They were careful enough to point out that even though profitability is an important yardstick for assessing efficiency that the extent of profitability should not be seen as final proof of efficiency. Efficiency in the context of capital adequacy implies that a bank with the same capital as another having a lower loan loss ratio is most likely to be adjudged to be more efficient but not necessarily more profitable. Many students over the years have used the terms 'Profit' and 'Profitability' interchangeably. However, there is a difference between the two in real sense. Profit is an absolute term, whereas, the profitability is a relative concept. Even though they are closely, the terms are mutually interdependent, having distinct roles in business. Profit refers to the total income earned by the enterprise during the specified period of time, while profitability refers to the operating efficiency of the enterprise. It is the ability of the enterprise to make profit on sales. It is the ability of enterprise to get sufficient return on the capital and employees used in the business operation.

Goddard, Molyneux & Wilson (2004) held that capital adequacy as a determinant of profitability of banks revealed that a high capital adequacy ratio should signify a bank that is operating over-cautiously and ignoring potentially profitable trading opportunities, which implies a negative relationship between equity to asset ratio and bank performance. Pasiouras & Kosmidou (2007) on the other hand, believed that banks with higher equity to asset ratio will normally have lower needs of external funding and therefore higher profitability. Yu Min-The (2006), went a step further by defining adequate capital for banks as the level at which the deposit insuring agency would breakeven in guaranteeing the deposits of individual banks with premium the banks pay. Various studies suggest that banks with higher levels of capital perform better than their undercapitalized peers. Staikouras and Wood (2003) claimed that there exists a positive link between a greater equity and profitability among EU banks. An option of theoretical framework was employed in his study for measuring fair capital adequacy holdings for a sample of depository institutions in Taiwan, during the period between 1985-1992. Except for the 1989, most banks in their sample proved to be inadequately capitalized so that capital infusion is required. George and Dimitrios (2004) applied non-parametric analytic technique (data envelopment analysis, DEA) in measuring the performances of the Greek banking sector with respect to capital adequacy. He proved that data envelopment analysis can be used as either an alternative or complement to ratio analysis for the evaluation of an organization's performance with attention to macroeconomics indicators. Abreu and Mendes (2001) also trace a positive impact of equity level on profitability. Goddard et al. (2004) supports the prior finding of positive relationship between capital/asset ratio and bank's earnings. Again the direction of the relationship between bank capital and bank profitability cannot be unanimously predicted in advance.

Al Sabbagh (2004) defined capital adequacy as a measure of bank's risk exposure, he went further to categorize risk into credit risk, market risk, interest rate risk and exchange rate risk. This is why the Central Bank of Nigeria (CBN) like their contemporaries in other countries are concerned as to the measure of "safety and soundness" since the ability of banks' capital to cushion the effects of losses is largely dependent on the level of capital adequacy. Scholars such as Bessis (2002) agree that banks' capital should match their risks, he stated that the VaR concept of modeling risks in assessing capital requirements is the foundation of risk based capital. Portfolio diversification of banks assets establishes scenarios where a loss resulting from some transactions extends to the totality of the portfolio. Koehn and Santomero (1980) studied the effect of capital ratio regulation and its effects on portfolio of commercial banks by examining the portfolio reaction to capital requirements.

Yu Min-Teh (1996) defined adequate capital for banks as the level at which the deposit insuring agency would just breakeven in guaranteeing the deposits of individual banks with the premium the bank pays. This was further supported by Dowd (1999) that established the capital adequacy of banks can be further strengthened by monetary authorities placing minimum capital requirements. Dowd (1999) also cautioned against the gap in information (asymmetry) between bank executives and depositor's which can lead to market failure. The possibility of market failure caused by information asymmetry is also supported by Nwezeaku and Okpara (2010) and Okpara (2016) that insists that there is a positive relationship between information and the value of a firm. Adebite (2010) studied the effect of the inflation rate on bank capital, he maintained that macroeconomic stability is fundamentally essential to capital adequacy hence increased inflation can impair the robustness of capital .



### 3.0 RESEARCH METHODOLOGY

#### 3.1 Research Design

The research adopts an ex-post facto research design. This investigates possible cause-and-effect relationship by observing an existing condition and trying to find out possible causes. Kim and Singal (1993) defined ex-post facto research as a situation where the independent variable has already occurred and the researcher starts with the observation of a dependent variable. It posits a causal link between them.

#### 3.2 Nature and Sources of Data

The data used for this research is secondary data got from the annual reports of four banks. The data is entirely appropriate and wholly adequate to draw conclusions and answer the question or solve the problem, it is cheaper to collect and is reliable as information needed to achieve the research objectives.

#### 3.3 Model Development

In the process of developing of the model the first step is to identify the correlation model that allows the inclusion of the variables (both independent and dependent) and the coefficient weights. The two dimensions of the coefficients are direction and magnitude. The directions indicates whether variations in the dependent variable are caused by changes in the independent variable.

#### 3.4 Model Specification

The model for this study was expressed in line with the hypotheses stated as follows

H<sub>1</sub>: The 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on the profitability of banks.

H<sub>2</sub>: The 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on customer deposits.

H<sub>3</sub>: The 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on lending.

A second order linear differential equation is an equation which can be written in the form

$$Y + p(x)y + q(x)y = f(x) \dots\dots\dots (1)$$

where p, q, and f are continuous functions on some interval I and Y is the dependent variable and X is the independent variable.

In the E-view statistics the linear equation is re-stated as  $Y=C(1)+C(2)*X$

$$NET\_PROFIT=C(1)+C(2)*BANK\_CAPITAL$$

$$TOTAL\_DEPOSITS=C(1)+C(2)*BANK\_CAPITAL$$

$$LOANS\_ADVANCES=C(1)+C(2)*BANK\_CAPITAL$$

#### 3.6 Model Assumptions

- Linearity - the relationships between the predictors and the outcome variable should be linear
- Normality - the errors should be normally distributed - technically normality is necessary only for the t-tests to be valid, estimation of the coefficients only requires that the errors be identically and independently distributed
- Homogeneity of variance (homoscedasticity) - the error variance should be constant
- Independence - the errors associated with one observation are not correlated with the errors of any other observation
- Model specification - the model should be properly specified (including all relevant variables, and excluding irrelevant variables)

Additionally, there are issues that can arise during the analysis that, while strictly speaking are not assumptions of regression, are none the less, of great concern to regression analysts.

- Influence - individual observations that exert undue influence on the coefficients

Many graphical methods and numerical tests have been developed over the years for regression diagnostics and E-views makes many of these methods easy to access and use. In this chapter, we will explore these methods and show how to verify regression assumptions and detect potential problems using E-views.

#### 3.7 Model Assumption

The assumptions that were adopted for this research were based on the following assumptions

1. The parameters estimated has to be commensurate with the quantity of data. If the quantity of data is not appropriate then the analysis would be flawed with problems such as those associated with multicollinearity.
2. The model specifications is assumed to be error free having been used as a measure for quantifying data of a secondary nature in previous research of this nature.

### 3.8 Variables

The variables used in the models are the dependent and independent variables, the former representing the effects while the latter represents the causes. Since the models are statistical the research looked at the dependent variable studied to find out variations as the independent variable varies.

#### 3.8.1 Dependent Variable

The study adopted the loans and advances, deposits and net profit of the selected banks for eleven years as the dependent variables for testing.

#### 3.8.2 Independent Variable

The Independent variable adopted is the total capitalization of the selected banks for the same period. Since the study is on bank recapitalization as a result of the reforms, it is important to see its effects on the said dependent variables.

### 3.9 Model Justification

Guha Deb and Mukherjee (2008) posits that academic literature on the relationship between financial development and economic growth dates back to the early twentieth century. In this case the financial development clearly is represented by the policy on recapitalization which translates to the contribution of banks towards economic growth through their deposits, net profits and credit creation abilities by loans and advances.

### 3.10 Techniques of Analysis

The techniques of data analysis used included the use of regression analysis and correlation coefficient of determination using the E-views statistical package.

## 4.0 Discussion of Results

### 4.1 Data presentation

This represents the data for the banks before they are analyzed or decision rules made.

**Table 4.1.1 ZENITH BANK PLC DATA**

Year	Bank Capital	Net Profit	Total Deposits	Loans & Advances
2005	32,971,651,100.00	715,592,600.00	23,341,342,800.00	122,494,396,000.00
2006	60,850,517,500.00	1,148,880,000.00	39,286,369,900.00	199,707,860,000.00
2007	97,294,252,400.00	1,877,980,400.00	634,492,524,000.00	288,111,826,000.00
2008	1,787,831,698,000.00	5,199,223,900.00	1,185,892,673,000.00	445,837,390,000.00
2009	165,970,300,000.00	20,603,000,000.00	1,173,917,000,000.00	698,326,000,000.00
2010	189,502,700,000.00	37,414,000,000.00	1,318,072,000,000.00	713,285,000,000.00
2011	2,309,427,000,000.00	44,189,000,000.00	1,653,570,000,000.00	832,828,000,000.00
2012	2,604,504,000,000.00	98,130,000,000.00	1,929,244,000,000.00	989,814,000,000.00
2013	3,143,133,000,000.00	91,588,000,000.00	2,276,755,000,000.00	1,251,355,000,000.00
2014	3,755,264,000,000.00	99,455,000,000.00	2,527,311,000,000.00	1,729,507,000,000.00
2015	4,006,842,000,000.00	105,663,000,000.00	2,557,884,000,000.00	1,989,313,000,000.00

*Source: Zenith bank annual reports (2005 -2015)*

**Table 4.1.2 ACCESS BANK PLC DATA**

Year	Bank Capital	Net Profit	Total Deposits	Loans & Advances
2005	31,342,000,000.00	637,000,000.00	22,724,000,000.00	11,462,000,000.00
2006	66,918,000,000.00	502,000,000.00	32,608,000,000.00	16,183,000,000.00
2007	174,554,000,000.00	737,000,000.00	110,879,000,000.00	54,111,000,000.00
2008	328,615,000,000.00	6,083,000,000.00	205,235,000,000.00	107,751,000,000.00
2009	1,033,945,000,000.00	15,853,000,000.00	353,746,000,000.00	245,836,000,000.00
2010	710,326,000,000.00	20,814,000,000.00	430,097,000,000.00	418,194,000,000.00
2011	804,824,000,000.00	11,068,000,000.00	486,926,000,000.00	429,782,000,000.00
2012	1,634,747,000,000.00	16,708,000,000.00	1,102,328,000,000.00	1,102,328,000,000.00
2013	1,745,177,000,000.00	42,862,000,000.00	2,253,119,000,000.00	2,253,119,000,000.00
2014	1,835,466,000,000.00	37,498,000,000.00	1,403,567,000,000.00	1,403,567,000,000.00
2015	2,591,330,000,000.00	65,869,000,000.00	1,756,159,000,000.00	1,756,159,000,000.00

*Source: Access bank annual reports (2005 -2015)*

**Table 4.1.3 FIRST BANK PLC DATA**

Year	Bank Capital	Net Profit	Total Deposits	Loans & Advances
2005	470,839,000,000.00	13,234,000,000.00	332,196,000,000.00	123,739,000,000.00
2006	616,824,000,000.00	17,383,000,000.00	448,915,000,000.00	177,303,000,000.00
2007	911,427,000,000.00	20,636,000,000.00	599,689,000,000.00	217,995,000,000.00
2008	1,528,234,000,000.00	36,679,000,000.00	700,182,000,000.00	466,096,000,000.00
2009	2,009,914,000,000.00	12,569,000,000.00	1,194,456,000,000.00	740,397,000,000.00
2010	2,354,831,000,000.00	29,177,000,000.00	1,447,600,000,000.00	1,072,640,000,000.00
2011	2,860,169,000,000.00	18,636,000,000.00	1,951,321,000,000.00	1,252,462,000,000.00
2012	3,186,128,000,000.00	75,670,000,000.00	2,400,860,000,000.00	1,541,687,000,000.00
2013	3,869,001,000,000.00	70,631,000,000.00	2,929,081,000,000.00	1,769,130,000,000.00
2014	4,343,737,000,000.00	84,148,000,000.00	3,050,853,000,000.00	2,178,986,000,000.00
2015	4,166,189,000,000.00	15,406,000,000.00	2,970,922,000,000.00	1,817,271,000,000.00

Source: Access bank annual reports (2005 -2015)

**Table 4.1.4 GTB BANK PLC DATA**

Year	Bank Capital	Net Profit	Total Deposits	Loans & Advances
2005	185,151,243,000.00	5,433,748,000.00	97,444,855,000.00	65,515,276,000.00
2006	308,410,742,000.00	8,306,778,000.00	215,773,715,000.00	84,200,695,000.00
2007	486,491,079,000.00	13,193,759,000.00	294,545,903,000.00	115,746,009,000.00
2008	963,118,828,000.00	29,913,704,000.00	532,239,165,000.00	421,807,522,000.00
2009	1,066,503,718,000.00	23,686,843,000.00	698,062,607,000.00	788,818,275,000.00
2010	1,152,001,900,000.00	38,346,623,000.00	779,138,714,000.00	843,743,330,000.00
2011	1,608,652,646,000.00	51,741,620,000.00	1,063,348,448,000.00	707,051,749,000.00
2012	1,734,877,860,000.00	87,295,957,000.00	1,172,057,424,000.00	783,914,842,000.00
2013	2,102,846,415,000.00	90,023,977,000.00	1,442,701,997,000.00	1,007,967,114,000.00
2014	2,355,876,526,000.00	98,694,919,000.00	1,649,869,816,000.00	1,281,376,727,000.00
2015	2,524,593,709,000.00	99,436,881,000.00	1,636,606,528,000.00	1,372,030,698,000.00

Source: GTB annual reports (2005 -2015)

## 4.2 Test of Hypotheses

### ACCESS BANK

**Table 4.2.1**

Dependent Variable: TOTAL\_DEPOSITS

Method: Least Squares (Gauss-Newton / Marquardt steps)

Date: 12/27/16 Time: 21:35

Sample: 2005 2015

Included observations: 11

TOTAL\_DEPOSITS=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-6.72E+10	1.68E+11	-0.399070	0.6991
C(2)	0.811887	0.130933	6.200771	0.0002
R-squared	0.810325	Mean dependent var		7.42E+11
Adjusted R-squared	0.789250	S.D. dependent var		7.68E+11
S.E. of regression	3.53E+11	Akaike info criterion		56.17811
Sum squared resid	1.12E+24	Schwarz criterion		56.25045
Log likelihood	-306.9796	Hannan-Quinn criter.		56.13250
F-statistic	38.44956	Durbin-Watson stat		2.096411
Prob(F-statistic)	0.000159			

**Table 4.2.2**

Dependent Variable: NET\_PROFIT  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 21:57  
 Sample: 2005 2015  
 Included observations: 11  
 NET\_PROFIT=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-2.94E+09	3.75E+09	-0.783493	0.4535
C(2)	0.022904	0.002919	7.845585	0.0000
R-squared	0.872437	Mean dependent var		1.99E+10
Adjusted R-squared	0.858263	S.D. dependent var		2.09E+10
S.E. of regression	7.86E+09	Akaike info criterion		48.57146
Sum squared resid	5.56E+20	Schwarz criterion		48.64380
Log likelihood	-265.1430	Hannan-Quinn criter.		48.52585
F-statistic	61.55320	Durbin-Watson stat		2.263661
Prob(F-statistic)	0.000026			

**Table 4.2.3**

Dependent Variable: LOANS\_\_ADVANCES  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:00  
 Sample: 2005 2015  
 Included observations: 11  
 LOANS\_\_ADVANCES=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.20E+11	1.76E+11	-0.681465	0.5127
C(2)	0.832305	0.137154	6.068385	0.0002
R-squared	0.803602	Mean dependent var		7.09E+11
Adjusted R-squared	0.781780	S.D. dependent var		7.91E+11
S.E. of regression	3.69E+11	Akaike info criterion		56.27094
Sum squared resid	1.23E+24	Schwarz criterion		56.34329
Log likelihood	-307.4902	Hannan-Quinn criter.		56.22534
F-statistic	36.82530	Durbin-Watson stat		2.005999
Prob(F-statistic)	0.000186			



**FIRST BANK**

**Table 4.3.1**

Dependent Variable: TOTAL\_DEPOSITS  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:07  
 Sample: 2005 2015  
 Included observations: 11  
 TOTAL\_DEPOSITS=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.54E+11	1.01E+11	-1.521218	0.1625
C(2)	0.749405	0.036930	20.29274	0.0000
R-squared	0.978612	Mean dependent var		1.64E+12
Adjusted R-squared	0.976235	S.D. dependent var		1.07E+12
S.E. of regression	1.65E+11	Akaike info criterion		54.65693
Sum squared resid	2.44E+23	Schwarz criterion		54.72928
Log likelihood	-298.6131	Hannan-Quinn criter.		54.61133
F-statistic	411.7955	Durbin-Watson stat		1.101320
Prob(F-statistic)	0.000000			

**Table 4.3.2**

Dependent Variable: LOANS\_\_ADVANCES  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:09  
 Sample: 2005 2015  
 Included observations: 11  
 LOANS\_\_ADVANCES=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-2.04E+11	6.07E+10	-3.363091	0.0083
C(2)	0.516900	0.022115	23.37290	0.0000
R-squared	0.983792	Mean dependent var		1.03E+12
Adjusted R-squared	0.981991	S.D. dependent var		7.35E+11
S.E. of regression	9.87E+10	Akaike info criterion		53.63144
Sum squared resid	8.77E+22	Schwarz criterion		53.70379
Log likelihood	-292.9729	Hannan-Quinn criter.		53.58584
F-statistic	546.2925	Durbin-Watson stat		2.043581
Prob(F-statistic)	0.000000			

**Table 4.3.3**

Dependent Variable: NET\_PROFIT  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:11  
 Sample: 2005 2015  
 Included observations: 11  
 NET\_PROFIT=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	6.99E+09	1.39E+10	0.501612	0.6280
C(2)	0.012056	0.005076	2.375062	0.0416
R-squared	0.385285	Mean dependent var		3.58E+10
Adjusted R-squared	0.316983	S.D. dependent var		2.74E+10
S.E. of regression	2.27E+10	Akaike info criterion		50.68801
Sum squared resid	4.62E+21	Schwarz criterion		50.76036
Log likelihood	-276.7841	Hannan-Quinn criter.		50.64241
F-statistic	5.640919	Durbin-Watson stat		1.926798
Prob(F-statistic)	0.041563			

**GTB**

**Table 4.4.1**

Dependent Variable: TOTAL\_DEPOSITS  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:15  
 Sample: 2005 2015  
 Included observations: 11  
 TOTAL\_DEPOSITS=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-3.61E+10	2.85E+10	-1.269123	0.2362
C(2)	0.688777	0.018631	36.96881	0.0000
R-squared	0.993458	Mean dependent var		8.71E+11
Adjusted R-squared	0.992731	S.D. dependent var		5.62E+11
S.E. of regression	4.79E+10	Akaike info criterion		52.18687
Sum squared resid	2.07E+22	Schwarz criterion		52.25921
Log likelihood	-285.0278	Hannan-Quinn criter.		52.14126
F-statistic	1366.693	Durbin-Watson stat		1.945707
Prob(F-statistic)	0.000000			

**Table 4.4.2**

Dependent Variable: LOANS\_\_ADVANCES  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:20  
 Sample: 2005 2015  
 Included observations: 11  
 LOANS\_\_ADVANCES=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-3.15E+10	8.60E+10	-0.366923	0.7222
C(2)	0.539678	0.056239	9.596149	0.0000
R-squared	0.910967	Mean dependent var		6.79E+11
Adjusted R-squared	0.901074	S.D. dependent var		4.60E+11
S.E. of regression	1.45E+11	Akaike info criterion		54.39640
Sum squared resid	1.88E+23	Schwarz criterion		54.46874
Log likelihood	-297.1802	Hannan-Quinn criter.		54.35080
F-statistic	92.08607	Durbin-Watson stat		1.443956
Prob(F-statistic)	0.000005			

**Table 4.4.3**

Dependent Variable: NET\_PROFIT  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:22  
 Sample: 2005 2015  
 Included observations: 11  
 NET\_PROFIT=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-9.37E+09	5.72E+09	-1.636964	0.1361
C(2)	0.044804	0.003745	11.96432	0.0000
R-squared	0.940846	Mean dependent var		4.96E+10
Adjusted R-squared	0.934273	S.D. dependent var		3.76E+10
S.E. of regression	9.63E+09	Akaike info criterion		48.97793
Sum squared resid	8.35E+20	Schwarz criterion		49.05027
Log likelihood	-267.3786	Hannan-Quinn criter.		48.93232
F-statistic	143.1451	Durbin-Watson stat		1.747883
Prob(F-statistic)	0.000001			

**ZENITH BANK**

**Table 4.5.1**

Dependent Variable: TOTAL\_DEPOSITS  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:27  
 Sample: 2005 2015  
 Included observations: 11  
 TOTAL\_DEPOSITS=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	5.45E+11	1.78E+11	3.065681	0.0134
C(2)	0.513847	0.079151	6.491957	0.0001
R-squared	0.824031	Mean dependent var		1.39E+12
Adjusted R-squared	0.804479	S.D. dependent var		9.03E+11
S.E. of regression	3.99E+11	Akaike info criterion		56.42751
Sum squared resid	1.44E+24	Schwarz criterion		56.49985
Log likelihood	-308.3513	Hannan-Quinn criter.		56.38190
F-statistic	42.14550	Durbin-Watson stat		1.203100
Prob(F-statistic)	0.000112			

**Table 4.5.2**

Dependent Variable: LOANS\_\_ADVANCES  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:29  
 Sample: 2005 2015  
 Included observations: 11  
 LOANS\_\_ADVANCES=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	2.77E+11	1.28E+11	2.166589	0.0584
C(2)	0.341983	0.057056	5.993821	0.0002
R-squared	0.799670	Mean dependent var		8.42E+11
Adjusted R-squared	0.777411	S.D. dependent var		6.10E+11
S.E. of regression	2.88E+11	Akaike info criterion		55.77285
Sum squared resid	7.46E+23	Schwarz criterion		55.84519
Log likelihood	-304.7507	Hannan-Quinn criter.		55.72725
F-statistic	35.92589	Durbin-Watson stat		1.764689
Prob(F-statistic)	0.000204			

**Table 4.5.3**

Dependent Variable: NET\_PROFIT  
 Method: Least Squares (Gauss-Newton / Marquardt steps)  
 Date: 12/27/16 Time: 22:31  
 Sample: 2005 2015  
 Included observations: 11  
 NET\_PROFIT=C(1)+C(2)\*BANK\_CAPITAL

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	5.34E+09	9.55E+09	0.559151	0.5897
C(2)	0.024635	0.004256	5.787871	0.0003
R-squared	0.788233	Mean dependent var		4.60E+10
Adjusted R-squared	0.764703	S.D. dependent var		4.43E+10
S.E. of regression	2.15E+10	Akaike info criterion		50.58161
Sum squared resid	4.15E+21	Schwarz criterion		50.65396
Log likelihood	-276.1989	Hannan-Quinn criter.		50.53601
F-statistic	33.49945	Durbin-Watson stat		2.284281
Prob(F-statistic)	0.000263			

## DISCUSSION OF RESULTS

The results would be discussed within the context of the relationship between the independent variable and the dependent variable tested for each of the analysis with their attendant interpretations of the analysis for the four banks under study given the formula  $Y=C(1)+C(2)*X$ .

### *Bank Capital and Net Profits*

Hypothesis one was formulated to test the first objective to determine if the recapitalization of 2005 had impacted on the net profit of banks.

The analysis as seen in tables 4.2.2, 4.3.3, 4.4.3 and 4.5.3 reveals that  $R^2$  and adjusted  $R^2$  for Access bank, GTB and Zenith bank were 0.87%, 0.85%, 0.94%, 0.93%, 0.78% and 0.76% respectively. This indicates that the regression line approximates the real data points and so is a very good fit. The coefficient of determination  $R^2$  in this case provides a measure of how well observed outcomes in the analyses are replicated by the model. In other words most of the variations in the deposits can be explained by changes in the bank capital over the eleven years under study. This indicates that the goodness of fit of the model was sufficient. However, the  $R^2$  and adjusted  $R^2$  for First Bank is 0.38% and 0.31% which supports the studies of Calomiris and Kahn (1991) that gain increases risk taking and the incentive to take risks may be impaired if the debt holders anticipate this behavior and require a premium to finance banks. In other words there is likely to be more demand deposits than savings account and fixed deposit accounts. The Durbin Watson statistics suggests positive serial correlation at 2.26, 1.92, 1.74 and 2.28 (see tables 4.2.2, 4.3.3, 4.4.3 and 4.5.3). Since Durbin Watson are not less than one there is no cause for alarm. A close look at the AIC, or Schwarz criterion, shows that the difference between the two is very negligible, an indicator of a near perfect model convergence near zero. The smaller they are the better the fit of your model is (from a statistical perspective) as they reflect a trade-off between the lack of fit and the number of parameters in the model.

The hypothesis one so tested confirms the findings in Berger and Bouwman (2013) that show that capital increases the survival probability and market share of banks. This is why the hypothesis one which states that the 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on the profitability of banks is hence rejected.

### *Bank Capital and Deposits*

Hypothesis two was formulated to test the second objective to find out if the 2005 recapitalization reforms had any effect on the level of deposits

A look at the analyses testing the effect of bank reforms represented by bank capital on bank deposits for the banks under study reveal that the  $R^2$  is 81%, 97%, 99% and 82% and adjusted  $R^2$  is 78%, 97%, 99% and 80% respectively for Access bank, First bank, GTB and Zenith bank respectively. This indicates that the regression line approximates the real data points and so is a very good fit. The coefficient of determination  $R^2$  in this case provides a measure of how well observed outcomes in the analyses are replicated by the model. In other



words most of the variations in the deposits can be explained by changes in the bank capital over the eleven years under study. This indicates that the goodness of fit of the model was sufficient. The Durbin Watson value in Access bank is 2.09 in the analyses which indicates that the successive error terms are close to one another on the average. This means that there is positive serial correlation. For First bank, GTB and Zenith the Durbin Watson statistics are 1.10, 1.94 and 1.20 respectively (see tables 4.3.1, 4.4.1 and 4.5.1). Since Durbin Watson are not less than one there is no cause for alarm. A close look at the AIC, or Schwarz criterion shows that the difference between the two is very negligible, an indicator of a near perfect model convergence near zero. The smaller they are the better the fit of your model is (from a statistical perspective) as they reflect a trade-off between the lack of fit and the number of parameters in the model.

Hypothesis two findings of a positive correlation between Bank capital and Deposits for the banks under study is consistent with Jiménez, G., Ongena, S., Peydró, J. L., and Saurina Salas, J. (2012) who observed that the global financial crisis negatively affected the lending activity of banks, especially those with low capital and liquidity ratios. Using a disaggregate measure they confirmed that tier 1 bank capital (but not tier 2 bank capital) and retail or customer deposits positively affected continuous lending during the financial crisis. This is why the hypothesis two which states that the 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on customer deposits is rejected.

### ***Bank Capital and Loans & Advances***

The hypothesis three was analyzed to test the third objective of the study as to the extent bank capital impacted the ability and extent of banks credit creation ability

The  $R^2$  is 80%, 98%, 91% and 79% and adjusted  $R^2$  is 78%, 98%, 90% and 77% respectively for Access bank, First bank, GTB and Zenith bank respectively. This indicates that the regression line approximates the real data points and so is a very good fit. The coefficient of determination  $R^2$  in this case provides a measure of how well observed outcomes in the analyses are replicated by the model. In other words most of the variations in the deposits can be explained by changes in the bank capital over the eleven years under study. This indicates that the goodness of fit of the model was sufficient. The Durbin Watson statistics reveal that there are positive signs of serial correlation. A close look at the AIC, or Schwarz criterion, shows that the difference between the two is very negligible, an indicator of a near perfect model convergence near zero. The smaller they are the better the fit of your model is (from a statistical perspective) as they reflect a trade-off between the lack of fit and the number of parameters in the model.

Berger and Bouwman (2013) established the effect of increased capital on the lending ability of small banks during banking crises than for medium and large banks. In their study Berger and Bouwman (2013) found evidence showing that small banks lent more if they had high levels of bank capital, whereas large banks lent more in the global financial crisis (but less in normal times) if their competing banks had low levels of bank capital. Hence, in a crisis, bank capital directly helps small banks whereas large banks gain a competitive advantage against weakly capitalized competitors. This is why the third hypothesis which states that the 2005 Nigerian banking sector recapitalization reforms does not have a significant effect on customer deposits is rejected.

## **5. Conclusions**

Over the years under review the capital base of the banks increased with their deposits, credit creation ability and returns on assets under stricter supervision the asset quality of banks in Nigeria improved significantly. The 2005 recapitalization reforms impacted positively on banks performance in Nigeria over the last eleven years as seen in the analyzed statistics. There was no cause for apprehension as expressed by critics of the reforms in 2005 as many studies since then have pointed out. This study of Access bank, First bank, GTB and Zenith bank are considered representative enough in measuring the impact of banking performance on the indices of profit, lending and deposits. However, the success of financial reform on economic growth depends on the level of financial development achieved in such an economy by the banks, especially the ones considered to big to fail. This is because in addition to wide network of branches these banks are leading the equities sector in the banking sub sector of the Nigerian Stock Exchange (NSE) in terms of P/E ratio, share price, value and volume of trade and capitalization.

## **6. Recommendations**

Because of the varied and often complex macroeconomic issues confronting the banking sector and the Nigerian economy such as poor policy coordination, socio-political instability, high business operational costs to investors, multiple taxation and levies, Nigeria is yet to realize its full growth potential in post deregulation era thirty years on. The Government needs to maintain a stable economic policy especially under rising inflation and foreign exchange scarcity in a recessional period such as Nigeria is in at the moment. Financial reforms are not exhaustive and hence monetary authorities should not rest on their oars. The government should further increase

the minimum capital from the 2005 levels because of the effects of inflation. There should be stricter moves to reduce information asymmetry to eliminate insider abuse within the banking system beyond that currently applicable. Furthermore, the incidence of bad debt can be greatly reduced if the risk/asset match for the loans is properly assessed. This is why the gap of information between the banks and CBN and the CBN and the various committees of the legislature or presidency must be reduced for proper conceptualization, coordination, implementation and assessment of government policies.

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