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THE IMPACT OF BANKING SECTOR REFORMS ON BANKS EFFICIENCY: EVIDENCE FROM THE EFFICIENCY MODEL
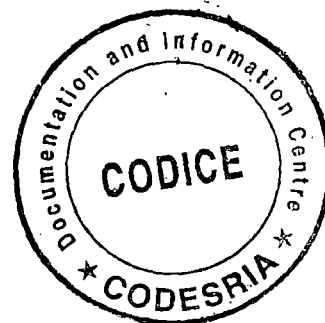
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TITLE PAGE

THE IMPACT OF BANKING SECTOR REFORMS ON BANKS EFFICIENCY: EVIDENCE FROM THE EFFICIENCY MODEL

BY

OKORIE MARTINA CHINAZO

(PG/M.SC/09/50738)

An M.SC Thesis Submitted to the Department of Economics

Faculty of Social Sciences

University of Nigeria, Nsukka.

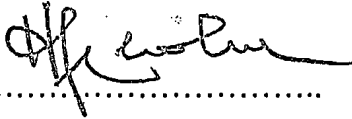In Partial fulfillment of the requirements for the award of Master of Science

(M.Sc) Degree in Economics

Supervisor: Rev. Fr. Dr. Hyacinth .E. Ichoku

May, 2013

CERTIFICATION

I hereby certify that Okorie, Martina Chinazo with registration number PG/M.SC/09/50738 has successfully completed the research requirement for the award of Masters degree in Economics, Faculty of Social Sciences, University of Nigeria, Nsukka. The work was written by the aforementioned student and has not been submitted in part or full anywhere for the purpose of awarding a Master of Science (M.Sc) Degree.

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Rev. Fr. Dr. Hyacinth .E. Ichoku   Date

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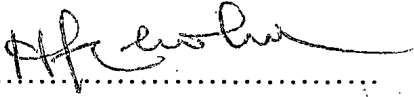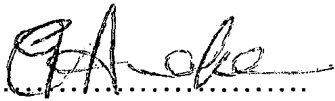
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APPROVAL

This research work entitled, "The impact of banking sector reforms on banks efficiency: Evidence from the efficiency model" written by OKORIE MARTINA, with the registration number PG/M.SC/09/50738, carried out under our supervision, has been examined and found to have met the requirements governing the awards of the Degree of Masters of Science (M.Sc) Economics of University of Nigeria Nsukka and is approved for its contribution to knowledge.

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(Head of Department)

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DEDICATION

This project is dedicated to my wonderful father who inspired me to further my studies. To my late beloved mother, your departure is still fresh in my mind even though you did not live to see your dreams fulfilled.

ACKNOWLEDGEMENTS

ABSTRACT

There is a growing concern associated with the recent banking sector reform on whether it achieved its purpose of making banks sound or whether it led to inefficiency of banks. Consequently, this study examined the impact of the banking sector reforms on banks' performance and efficiency in two time periods (pre -consolidation period and post - consolidation). To evaluate this, the researcher adopted a non-parametric (Data Envelopment Analysis) approach, and the factors that determine efficiency was examined. The findings revealed varying levels of efficiency in both periods. Although some banks still remained inefficient, there was a general improvement in efficiency in the post-consolidation period. The ranking of banks showed that the banks that were able to achieve the ₦25billion capitalization on their own (without relying on merger) and the banks that were among the largest, were among the least efficient. More so, the study found that the CAMEL parameters are influencing factors of efficiency, and that no single parameter can capture the holistic efficiency of banks. In the light of this, the researcher recommends the simultaneous consideration of the CAMEL parameters when proposing subsequent reforms and continuous examination of banks. Stringent measures should be taken by the Central Bank in the supervision of banks such that no bank is overlooked. Commercial banks in Nigeria should adopt the Basle II prescription of capital adequacy and the CAMEL parameters should not be increased beyond optimal level as it leads to a decline in efficiency.

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CHAPTER ONE
INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Banks represents the heart of the national economic life and the nucleus of the economic survival around which other sectors are tangential. In the absence of banks, borrowers would have to approach those with surplus funds and negotiate with them individually and severally, and this is certainly a cumbersome and time consuming process. Banks therefore, pool savings together from the surplus spending units and supplying them to the deficit units requiring short and medium term funds for investment.

The role of banks is important as they allocate funds for the maximum value use, limit the risks and costs, and generate economic activities (Jaffe and Levonian, 2001). According to Sanusi (2012) bank mobilizes savings for investment purposes which further generates growth and employment. Government also raises funds through the banking system to finance its developmental programmes and strategic objectives. Anyanwaokoro (1999) asserts that the banking system is the heart of the financial system and the most important component of the Nigerian financial system. This is because apart from being the key operators in the financial markets, monetary policies of government are implemented through the banking system. Moreover the banking system creates money, and by doing this influences the economy of a country in no small measure. For instance, China achieved an annual Gross Domestic Product (GDP) growth of over nine per cent during the past 30 years, becoming the third largest economy in the world next to the USA and Japan, with its banking system contributing greatly and has become more influential in world financial markets (Jiang and Yao, 2011).

It is in view of these strategic roles of banks that the issue of a sound banking system becomes imperative. A sound banking system is one in which individual banks accounting for most of the system's transactions are solvent, and meet capital adequacy requirements (Josefsson, 2002). While a feeble banking system is repressive, discretionary and discounts the intermediation process thereby precipitating macroeconomic instability (Kama, 2006). A weak bank not only jeopardizes the long time sustainability of an economy, it can also be a trigger for a financial

crisis which can lead to economic crisis (Vaithilingam, Nair and Samudram, 2006). The health of the banking system of a nation determines the wellbeing of the economy (Osaze, 2000). Indeed it is an awareness of the roles of banks in the financial landscape and the economy, and the need for an efficient bank and the consequences of a weak banking system that technological innovations meant for positive adjustment is introduced at any little signal of anomaly.

According to Ezirim and Moughalu (2004), banking sector reforms "represent the various transformations and policy adjustment and overhaul that are directed to the art, policies and activities of the banking sector overtime in response to the nominated need for operational improvement and growth of both the sector and the general economy". As observed by Ebong (2006) banking reforms are deliberate policy response to correct impending or perceived financial crises and subsequent failure. No doubt it is in this context that the Nigeria banking sector over the past few decades experienced various reforms. These policies in Nigeria are aimed at improving the financial strength and lending capacity of banks through recapitalization, promote real banking activities, protect depositors' funds, and evolve a sound banking industry and by extension, a more efficient banking system. These policies have been fiercely promoted by, among others by the government and the monetary authority.

Before the financial deregulation in 1986, the banking sector has been described as static for almost ten years with 29 commercial banks owning 60% of total banking assets (Lewis and Stein, 1997). This made the banks the centre of the gamut of the reform in the financial sector with the adoption of Structural Adjustment Programme (SAP) in Nigeria in 1986, in which World Bank and IMF prescriptions comprised a currency devaluation, trade liberalization and privatization of state enterprises among others. In this context, the major reforms carried out were the deregulation of interest rates, exchange rate and entry/exit into the banking industry. Other measures included, establishment of the Nigeria Deposit Insurance Corporation (NDIC), recapitalization, strengthening the regulatory and supervisory institutions and the introduction of direct monetary policy instruments (Nnanna et. al. 2004). As stated by Egwakhe and Osabuohien (2009) the Structural Adjustment reform was inward looking and exerted a profound neglect of financial institutions tasks in financing economic activities. For instance, the number of banks increased from 40 banks in 1985 to over 100 banks in 1990. One of the reasons was the

parallel exchange rate regime due to the perceived overvaluation of the domestic currency which allowed banks to quickly make profits from various arbitrage opportunities. Hereby, banks with connections to the political elite often had preferred access to exchange rate auctions and could sell the foreign exchange for a high premium especially in relation to increased trade-related financing after the SAP and the implemented trade liberalization. Many of the new banks were not interested in intermediating funds from depositors to lenders but rather made quick profits from the arbitrage and other rent seeking activities. As a consequence of the high fragmentation and low financial intermediation, the Nigerian monetary authorities established some prudential guidelines in 1990-91 and a moratorium on new bank licenses in 1991. The financial bubble burst as stock market prices fell sharply, and the extent of non-performing loans became evident. For example, during 1992-93, the Nigeria Deposit Insurance Corporation announced that 24 banks were insolvent and 26 in serious trouble; these 50 banks had two-thirds of total banking assets and three-quarters of deposits in Nigeria's financial system (Lewis and Stein, 1997). Also, according to Caprio and Klingebiel (2003), Nigeria faced a systemic banking crisis throughout the 1990s. Nigeria's financial indicators such as liquid liabilities, bank assets, private credit or financial system deposits therefore remained relatively low throughout the 1990s by historical standards and only started to significantly increase after 2000. In 1998, 26 bank licenses were revoked, reducing the total number of banks from 115 to 89. A guideline of 1999 amends Banking and Other Financial Institutions Decree of 1991 and introduces universal banking. Even though the macroeconomic environment improved with a new civilian government regime after 1999, the Nigerian financial system was still characterized by very high fragmentation and low financial intermediation.

In this context, the CBN decreed on July, 6, 2004 that banks had to increase their minimum capital requirements from ₦ 2 billion to ₦25 billion ($ US 190 million) by the end of 2005. The intention was to increase the average size of banks via merger and acquisitions to materialize economies of scales, create new product development and overall generate a more stable banking system with a higher contribution to financial intermediation. By the beginning of 2006, the number of banks shrank from 89 to 25 banks with 14 banks from the original 89 banks failing to increase their capital or secure partners. For many foreign-owned banks, the new capital requirements were achieved by capital injections from the parent company. Also, in the process

of the banking consolidation, banks raised over $ US 3 billion on the Nigerian stock market. With the highest inflow of Foreign Direct Investment (FDI) ever recorded in the non-oil sector within one year amounting to $500 million (Okpara, 2011).

Most of the reforms carried out in Nigeria banks at one point or the other have invariably been evolved around firming up capitalization this, is due to the importance of capital. Even though this reforms have consistent resultant effect in the cumulative number of banks. Below is a table showing the various changes in capitalization and the number of banks.

Table 1.1: Minimum Capital Requirement and Number of Banks in Nigeria (1952-2010)

Years	Minimum capital requirement in Naira (₦)	Minimum capital Us $	Cumulative number of banks
1952-1978	25,000 600,000	29,412 705,882	45
1979- 1987	600,000	600,000	54
1988- feb.	5million	250,000	66
1988-oct.	10Million	500,000	66
1989- 1990	20million	235,294	107
1991- 1996	50 million	586,235	112
1997-2002	500 million	5.88 million	110
2003-2004	2billion	0.0166 billion	89
2004-2010	25billion	0.2 billion	24

Sources: Central Bank of Nigeria Financial Publications (various issues).

The table above reveals that the banking sector between; 1952-1978, recorded forty-five (45) banks with varying minimum paid-up capital for commercial banks. The number of banks increased to fifty-four (54) between1979-1987. The number of banks rose to one hundred and twelve (112) between; 1988 to 1996 with substantial varying increase in the minimum capital. The number of banks dropped to one hundred and ten(110) with another increase in minimum paid-up capital and finally dropped to twenty-five in 2006 with a big increase in minimum paid-up capital from ₦2billion(USD0.0166billion) in January 2004, to ₦25billion(USD0.2billion) in July 2004.

Banks have a pivotal role to play in the future of Nigeria's development. Their ability and importantly, the manner in which they provide capital, have the potential to encourage Nigeria's development trajectory. Hence, as Nigeria undertake country-wide reform programme to reposition the Nigeria economy to achieve the objective of becoming one of the 20 largest economies by the year 2020, the banking sector is expected to play its actual role in intermediation and be among global players in the international financial market.

1.2 STATEMENT OF THE PROBLEM

The banking industry in 2004 was generally described as fragmented into relatively small, weakly capitalized banks with most banks having paid up capital of US $10 million or less. The best capitalized bank had capital of US $240 million as compared to a small developing economy like Malaysia where the least capitalized bank had capital of US $526 million at the time. Also, they had a very high average cost as it witnessed a heavy increase in fixed costs and operating expenses emanating from building of expansive headquarters with bunching of branches in a few commercial centers. Ebong (2006) described the system as exhibiting other features like; high non-performing loans, insolvency and illiquidity, low capital base, over dependence on public sector deposits, poor asset quality, weak corporate governance, a system with low depositors' confidence and a banking sector that could not support the real sector of the economy at 25% of GDP compared to African average of 78% and 272% for developed countries. As stated by Soludo (2004) "the system faces enormous challenges which, if not addressed urgently, could snowball into a crisis in the near future". This is revealed in CBN

(2004) report as no bank was rated very sound in Nigeria. The top ten banks were adjudged as sound, with 51 banks merely satisfactory while 16 banks were just marginal and 10 banks were declared unsound. To address these issues and to reposition the banking system, the monetary authority came up with a 13-point reform agenda centered on consolidation and recapitalization.

Despite the various reforms undertaken since 1987, there has been a consistent increase in the number of failed banks. For instance, in the graph below, the number of distressed deposit-money banks i.e. those rated as marginal or unsound shows a gradual increase. The marginal and unsound banks increased from seventeen (17) in 2001 to twenty three in 2002 and 2003, and then twenty seven in 2004 representing thirty (30) per cent of the operating banks in the system. This is shown in the graph below.
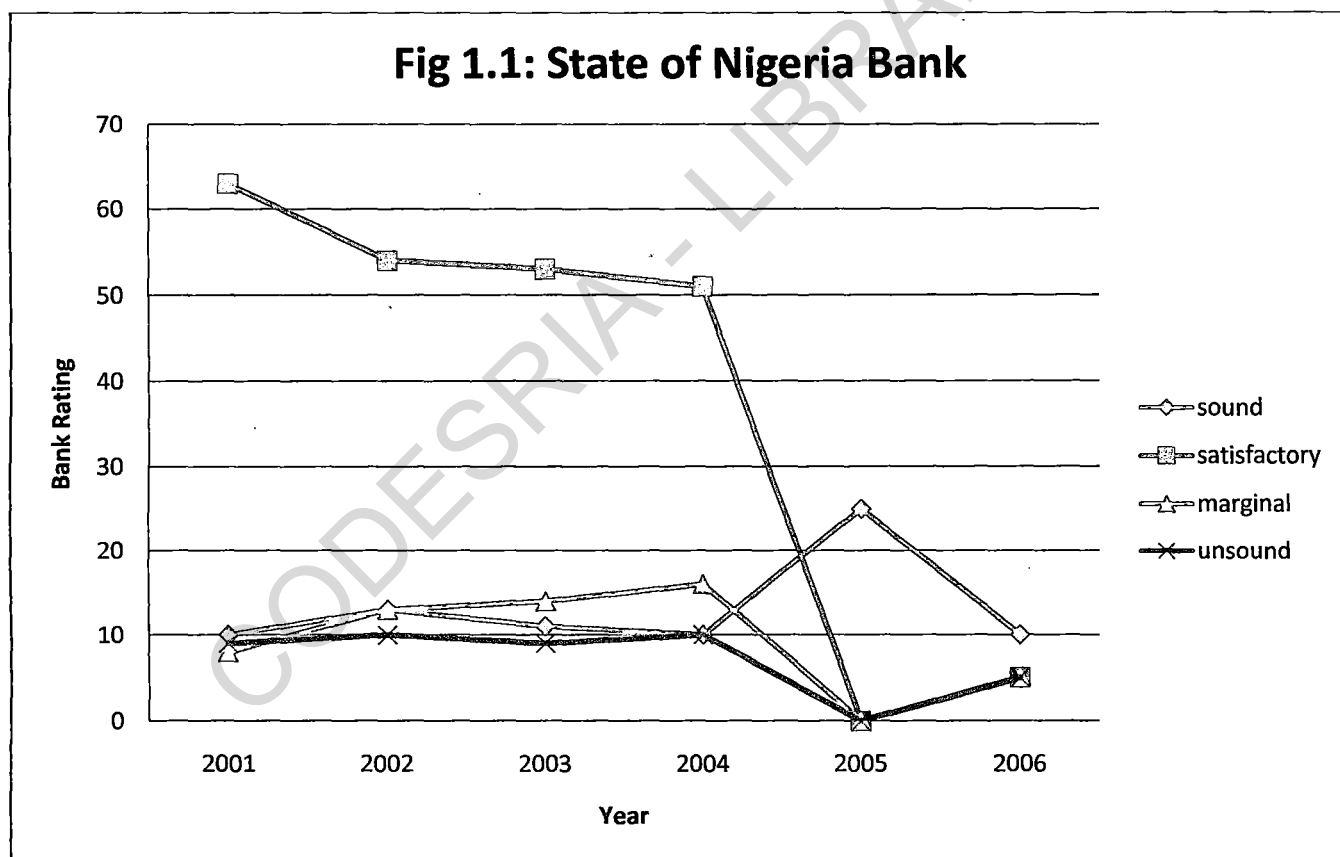
Sources: CBN Publication (2006)

The policy thrust of the reform of evolving a sound banking system could be said to have being achieved as all banks were rated sound in 2005 but however, this was followed by an in increase in the number of distressed banks.

As observed by Sanusi, (2010) despite the consolidation, in mid-2008 when the global financial and economic crisis set in, the banking system witnessed the re-emergence of an extremely fragile financial system similar to pre-consolidation era. For example, the assessment of the financial condition of banks in 2009 revealed inadequacies in capital asset ratios and liquidity ratios as well as weaknesses in corporate governance and risk management practices in 9 banks. However, eight banks were adjudged insolvent and received a total sum of 620 billion naira or approximately US$ 4.1 billion from the CBN in conjunction with NDIC and the Federal Ministry of Finance (MOF), representing 2.5% of Nigeria's entire 2010 GDP of US $167 billion (Alford, n.d). According to Ogujiuba and Obiechina (2011), eight main interdependent factors are believed to have led to the creation of an extremely fragile financial system that was tipped into crisis by the global financial crisis and recession. These factors include; macro economic instability caused by large and sudden capital inflows; major failures in corporate governance at banks; lack of investor and consumer protection; inadequate disclosure and transparency about the financial position of banks; critical gaps in regulatory framework and regulations; uneven supervision and enforcement; unstructured governance and management process at the CBN; and weaknesses in the business environment in the country. The Central Bank of Nigeria (CBN) in response to the above problems, unveiled a ten-year reform blue print anchored on four cardinal reform programmes for the stabilization of the banking sector and the finance sector in general. The four cardinal programmes for the sector's transformation involves enhancing the quality of banks; establishing financial stability; enabling healthy financial sector evolution and ensuring that financial sector contributes to the real economy.

There is no general agreement in the literature however, on whether banking reform really help to improve the efficiency of banking institutions. Several authors like: Ahmed, Farooq, and Jalil (2009), Olaosebikan (2009), Iganigan (2010), Hardy and Patti (2001) claim that banking reform contributes to the efficiency with which banks transform saving into investment and growth. Others like: Ikhide and Alawode (2001), Ogun and Akinlo (2011) emphasize that banking reform

policies may make it more difficult for banks to function properly and that such policies help in triggering financial and economic crises. Surprisingly, however, only a limited number of studies have looked into the efficiency effects of banking reform policies in Nigeria. An evaluation of the available studies in Nigeria shows that many of them focus on the financial sector as a whole; leaving open the possibility that bank efficiency may improve after reform due to external effect from other financial institution, while with just banking sector reform the opposite may be found. Moreover, several studies that used Data Envelopment Analysis (DEA) to evaluate efficiency of banks were not carried out in Nigeria and the few on Nigeria did not take into account the extent to which reform policies have been carried out, and they generally do not evaluate changes in these policies over time.

1.3 RESEARCH QUESTIONS

i Did the efficiency of banks improve pre and post consolidation?

ii What are the determinants of efficiency of banks?

1.4 OBJECTIVES OF THE STUDY

The main aim of this study is to evaluate the impact of banking sector reforms on bank efficiency. The specific objectives are:

i To investigate the structural changes in the pre and post- consolidation periods.

ii To determine the factors that affect bank efficiency.

1.5 RESEARCH HYPOTHESES

The following research hypotheses in their null forms were tested.

H_0: There is no structural change in the pre and post- consolidation periods.

H_1: Capital adequacy, Assets, Management, Earnings and Liquidity (CAMEL) do not determine the efficiency of banks.

1.6 SIGNIFICANCE OF THE STUDY

The banking sector, in a broad sense, is akin to the 'brain' of the economy, hence the scrutiny of the overall efficiency of the banking sector is important to depositors, potential investors, and of course, to the policy makers as banks are the effective executors of the monetary policy of the government.

Therefore, the wake-up call for banking sector reform should be critically examined especially its impacts on the banking industry. This study is important at this point of economic development when efforts are being made to reposition the banking sector to enable it play key roles in economic development and help achieve the vision 2020. It will help policy makers and government to know the structural changes that have taken place with the reform policies on ground in the banking sector. It will also provide useful information that will be relevant in formulating a more targeted banking reform policy that will help improve bank efficiency. More so, the study would further add to the existing literature on the link between banking sector reform and bank efficiency and aid researchers for further research in this area.

1.7 SCOPE OF THE STUDY

This study is limited to commercial banks and covers the period of 1999 to 2010. The year 1999 is the selected start date because Nigeria transitioned into civilian rule that year, lending more credence to the reliability of data available. The year 2002 to 2004 captures the pre consolidation period and the period of 2005 to 2010 captures the period of post consolidation. The researcher used 10 banks due to the availability of data.

1.8 LIMITATIONS OF THE STUDY

All research works generally record a number of limitations as hindrances in the course of the research and this was not an exception. The study originally intended to use 24 banks but 10

banks were used due to the unavailability of data. Data for some banks were not made available. Also, 1999 was proposed to be the start date but most banks data for 1999 was not available.

1.9 Organisation of the study

This study is organized into five chapters; the first chapter detailed the background of the study showing the related works, policies and the existing debate. Then the statement of the problem that showed the research and economic problem of the study that translates into the research questions and objectives of the study. The second chapter details the existing theoretical and empirical literature on the subject matter. While chapter three showed the analytical framework and model specification of the model used. The presentation of analysis results and evaluation of hypothesis are discussed in chapter four. The last chapter captioned as chapter five, summarises the work, and concludes then proffer recommendations from the findings.

CHAPTER TWO

LITERATURE REVIEW

2.1 CONCEPTUAL FRAMEWORK

In the banking literature, there has been some disagreement on the definition of banks' inputs and outputs and how they could be measured, despite the increasing interest in studying the banking industry. These terms from the quantum of services banks provide as well as the different views regarding the treatment of such services as inputs and/or outputs. The measurement problem is worsened by the lack of theoretical basis for this definition.

Despite the disagreement as to the definition of inputs and outputs in the banking industry, there is a general agreement in the literature among authors on two main approaches that could be used to define the input and output variables in the spectrum of services that banks provide. These two approaches are based on the functions of banks. The production approach and the intermediation approach. In the production approach, banks are modeled producers of deposits and loans by using inputs labour and capital. Within this approach, deposits are treated as outputs. The production approach is also regarded as Value Added Approach. While the intermediation approach models financial institutions as intermediating funds between savers and investors, it measures the efficiency of banks in converting deposits into loans. Therefore, in the context of intermediation approach, deposits are treated as inputs (Miller and Noulas 1996). In this study, we have used the intermediation approach by incorporating deposits, labor and capital as inputs and loans & advances and investment as outputs.

The literature on financial sector reforms is replete with studies which show that the objectives are broadly the same in most countries of Sub-Sahara Africa. Omoruyi (1991), CBN (2004) and several financial sector analysts summarized these objectives to include: market liberalization for the promotion of a more efficient resource allocation; expansion of savings mobilization base, promotion of investment and growth through market-based interest rates. It also means the improvement of the regulatory and surveillance framework; fostering healthy competition in the provision of services and above all laying the basis for inflation control and economic growth.

There also seems to be a universal agreement within the literature that these objectives could be attained through deregulation of erstwhile regulated domestic money and foreign exchange markets, adoption of market based approach to credit allocation and the pursuit of sustainable fiscal and monetary policies. It could also require the restructuring of financial markets via legislative changes and the active use of prudential regulations and enforcement of capital adequacy requirements.

With regard to the banking sector, the literature is of the view that its reform is imperative if it is to "to play a key role in pricing and trading risks and implementing monetary and fiscal policies" as part of the process of "a shift in emphasis to a private sector led economy". It is further argued by this school of thought that reforms which foster institutional efficiency is imperative if the banking sector is to play the desired catalytic role in the real sector" (NPC 2004). The arguments are that for efficiency, such reforms should address the issues which militate against the efficiency of the banking sectors such as: the "shallow depths of the capital market, dependence of financial sector on public sector and foreign exchange trading as sources of funding; apparent lack of harmony between fiscal and monetary policies and above all, the poor loans repayments performance as well as bad debts (Ojo 2005; Nnanna 2005). In terms of policy thrust therefore, the banking sector reforms is expected "to build and foster a competitive and healthy financial system to support development and to avoid systemic distress" (Soludo, 2007).

2.1.1 THE OVERVIEW OF NIGERIAN BANKS

The banking sector in Nigeria is made up of a wide array of institutions and instruments. It consists of the Central Bank of Nigeria which is the apex financial institution, Commercial and Merchant Banks, and Development Finance Institutions. The central bank of Nigeria stands as the apex bank, licenses, supervises, and regulates the banks within the banking system. It also acts as a lender of last resort, clearing house and issuance currency. While the commercial bank is the first set of bank to appear in the Nigerian banking sector, it is defined by the Banks and Other Financial Institutions Decree No. 25 of 1991 as "any bank in Nigeria whose business includes the acceptance of deposits withdraw able by cheques". This definition presents the major distinguishing functions of commercial banks from other banks amongst others like

mobilization of savings, monetary transmission, financial intermediation/ credit extension and provision of international and other services (Anyanwaokoro, 1999).

However in 1960, the need to bridge the gap in the maturity structure of commercial banks which provide more of short terms loans led to the emergence of merchant banks in the system. They merchant banks collect deposits from large savers ranging from a stipulated minimum amount. Apart from current accounts and cheque clearing, merchant banks provide the other services of commercial banks but in a large scale. In addition, they serve the needs of corporate and institutional customers, by providing them with medium and long-term finances. They do this through; loan syndication, debt factoring, equipment leasing, underwriting of shares and securities, acceptance and negotiation of bills of exchange and investment advisory services (Anyanwaokoro, 1999). The number of commercial and merchant banks has increased from 12 in 1960 (at independence) to about 120 at the end of 1992 with a branch network of 2391 out of which commercial banks account for 2275 (with 774 in the rural areas).

At the end of 1985, (prior to the commencement of the structural adjustment programme), the ownership structure of the share capital in commercial banks indicated dominant ownership by government (Federal and State) accounting to 58.6 per cent followed by private shareholders (22.5 per cent) and foreign interests (18.9 per cent). Today with government divestiture of its ownership in major enterprises, the ownership structure has tilted in favour of private individuals with foreign interest playing only a supporting role. Commercial Banks dominate the Nigerian Banking industry; they account for 71.2 per cent of total credit outstanding to the private sector as at the end of 1993. The patterns of investment in recent times are concentrated in 'other assets' followed by loans and advances and interbank placements. Whereas commercial banks concentrate on the retail end of the financial system, merchant banks are supposed to transact wholesale banking business. Recently, merchant banks have relied on short term sources of funds, which are reflected in the preponderance of short term loans in their portfolio.

However, in 1999, universal banking was adopted which classified banks according to their function hence, making the commercial and merchant banks to be known as deposit-money banks. In addition to these, six development finance institutions also operate in the system. These are the Nigerian Agricultural and Cooperative Bank, the Nigerian Industrial Development Bank, the Nigerian Bank for Commerce and Industry, the Federal Mortgage Bank, the Nigerian Export-

Import Bank (NEXIM) and the recently established Urban Development Bank. As their names suggest, these are development finance institutions charged with the responsibility of providing loan and industrial finance by attracting foreign resources, mobilizing domestic savings and allocating investment funds efficiently. More often than not, they are established in recognition of unfulfilled credit needs of domestic industries. Specialized banks have been established with the onset of the structural adjustment programme to meet up with the ever increasing credit needs of segments of the society who are not adequately catered for by the existing arrangement. These are the Community banks whose capital requirements are provided by the communities in which they are located and the Peoples Bank which is supposed to provide for the needs of small and medium scale entrepreneurs in the society. Both of them are designed to provide credit facilities at grassroots level and thereby promote self-reliance. At the end of 1993, the Peoples Bank was operating 271 branches and 879 community banks. However, these banks were merged to be known as micro finance banks.

2.1.2 PHASES OF FINANCIAL REFORMS

The banking reforms in Nigeria have been classified into four phases:

Phase I (1987-1993)

This phase comprised of the deregulation of the banking industry, interest rate and foreign exchange policy reforms. The reforms pertaining to the banking industry commenced in January 1987 (Ikhide and Alawode 2001, Asogwa 2005). The market mechanism was left to determine the rate of interest on loans and deposits that banks charge. The number of banks increased from 56 in 1986 to 120 in 1993. The phenomenal growth in the number of banking institutions overstretched the regulatory capacity of the CBN while the growing sophistication in the design and use of financial instruments heightened the risks of malpractices and fraud in the industry. In particular, mismanagement such as insiders' abuse and poor credit appraisal systems, resulted in the accumulation of unpaid loans and advances, which eventually contributed to the distress situation experienced in the banking system in the early 1980's and mid 1990's and the revocation of the licenses of 26 banks in 1997 (Wilson,2005).

To ensure the healthy platform for the system, Nigerian Deposit Insurance Corporation (NDIC) was established in 1988 and commenced operation in January 1989. In 1991 two new decrees

were put in place to enhance the powers of the regulatory and supervisory authorities of the financial system to enable them manage the reform packages well

Phase II (1994-1998)

During this period, the banking sector suffered deep financial distress which necessitated another round of reforms, designed to manage the distress. 1993 recorded 33 distressed banks for the first time since the establishment of the central bank; and in 1995 the number increased to 66 (Okpara, 2010). By 1994 another reform measure was introduced. Banks were granted permission to start paying interest on demand deposits. Also cash reserve ratio which before the reforms has been virtually stagnant was revised, to now begin to work as an indirect instrument of credit control and granting of loans on the strength of foreign exchange held in foreign accounts was prohibited. All government deposits held by the commercial and merchant banks were withdrawn, so that banks could function without undue government interference (Adegbite, 2005).

Phase III (1999-2003)

This phase saw the return to liberalization of the financial sector, accompanied with the adoption of distress resolution programmes. This era also saw the introduction of universal banking which empowered the banks to operate in all aspect of retail banking and non- bank financial markets (Balogun, 2007).

Phase IV (2004 to date)

This phase of reform unlike other reforms that was informed by government was informed by the Nigerian monetary authorities who asserted that the financial system was characterized by structural and operational weaknesses and that their catalytic role in promoting private sector led growth could be further enhanced through a more pragmatic reform (Balogun, 2007). Prior to this reform, Soludo (2004), described the industry as generally characterized by small- sized and marginal players with very high overhead cost, the primary objective of the reform is to guarantee an efficient and sound financial system. The reforms are designed to enable the banking system develop the required resilience to support the economic development of the nation by efficiently performing its functions as the fulcrum of financial intermediation (Lemo,

2005). Thus the reforms were to ensure the safety of depositors' money, position banks to play active development role in the Nigerian economy, and become major players in the sub-regional, regional and global markets (Adeyemi, 2007). The two major elements of the reform agenda are the requirement for Nigerian banks to increase their shareholders funds to minimum of N25 billion by the end of December 2005 and consolidation through Mergers and Acquisition. The consolidation of the Nigerian banking system started after the announcement of July 6, 2004 by Soludo, the Governor of Central Bank of Nigeria of the 13 – Point agenda of banking sector reforms.

The components of the reform agenda include:

i) Minimum capitalization for banks of ₦25 billion with full compliance by 31st December, 2005;

ii) Consolidation of banking institutions through mergers and acquisitions;

iii) Phased withdrawal of public sector funds from banks starting in July, 2004;

iv) Adoption of a risk-focused and rule-based regulatory framework;

v) Adoption of zero tolerance in the regulatory framework, especially in the area of data/information rendition/reporting;

vi) Automating the process for the rendition of return by banks and other financial institutions through the enhanced Financial Analysis and Surveillance System (e-FASS);

vii) Establishment of a hotline, confidential internet address (Governor Cenbank.org) for all those wishing to share any confidential information with the Governor of the Central Bank on the operations of the banks or the financial system;

viii) Strict enforcement of the contingency planning framework for systemic bank distress;

ix) Establishment of an Assets Management Company as an important element of distress resolution;

x) Promotion of the enforcement of dormant laws, especially those relating to the issuance of dud cheques, and the law relating to the various liabilities of the board members of banks in cases of failings of the banks;

xi) Revision and updating of relevant laws, and the drafting of new ones relating to the effective operations of the banking system.

xii) Collaborating closely with the Economic and Financial Crimes Commission (EFCC) in the establishment of the Financial Intelligence Unit (FIU) and the enforcement of the anti-money laundering and other economic crime measures;

xiii) Rehabilitating and effectively managing the Nigerian Security Printing and Minting (NSPM) Plc to meet the security printing needs of Nigeria, including the banking system which constitutes over 90 per cent of the NSPM's business.

However, while the reforms was still on going, the banking sector was affected by a global financial crisis resulting to eight banks been declared as insolvent and the sum of 620 billion injected to rescue these bank. Also, their executive directors were sacked and handed over to the Economic and Financial Crimes Commission for prosecution. With the resumption of office by another CBN governor Sanusi, this phase of reform saw the introduction of another round of reform that rests on four pillars: (1) enhancing the quality of banks, (2) establishing financial stability, (3) enabling healthy financial sector evolution, and (4) ensuring the financial sector contributes to the real economy.

To improve corporate governance of Nigerian banks, the CBN in January 2010, issued regulations limiting the terms of CEO's of banks to a maximum of ten years which will require some sitting CEO's to resign by July 31, 2010. To further enhance the level playing field in the banking sector post-consolidation, According to Alford, (N.D) In June 2009, Sanusi issued a policy requiring Nigerian banks to adopt a common accounting year for 2009. By year end 2009 all banks must change their accounting years to the calendar year and all subsidiaries of the parent bank must follow the same accounting year. In March 2010, The CBN announced its plans to categorize banks by function and allow a variety of banks to operate in Nigeria with varying levels of capital depending on the bank's function as opposed to the single current minimum capital of 25 billion naira (approximately US $173 million). The intent is to allow the creation of banks that would serve different market segments, such as small- and medium-sized enterprises, and to phase out the "one size fits all" requirement by September 2011.Each type of bank would apply for a different license. This policy is a fundamental reversal of the consolidation policy of 2005 and is likely to encourage the development of an increased number of financial institutions in Nigeria.

Of importance to this study is the third and fourth phase of this reform.

2.2 THEORETICAL LITERATURE

This will consist of theoretical literature on banking reform. However, there exist three strands of theoretical literature on banking reform. Namely,

I. BANKING REFORM AND EFFICIENCY

On a divergent approach, efficient structure theory denotes that industrial concentration would intensify the general efficiency of the industry. This approach sees gradualism coming into play since efficient banks grow rapidly than inefficient banks or acquire the less efficient banks to become efficient (Egwakhe and Osabuohien, 2009). However, proponents of financial reform argue that financial reform may affect bank efficiency in two different ways; positive and negative ways.

On the positive side, reform policies targeted towards the elimination of government control and intervention aims at restoring and strengthening the price mechanism, as well as improving the conditions for bank competition (Hermes and Lensink, 2008). This, it is argued, will lead to more efficient allocation of scarce financial resources. Competitive pressure stimulates banks to become more efficient by reducing overhead costs, improving bank management, improving risk management, and offering new financial instruments and services (Denizer *et al.,* 2007). More so, if domestic banks are opened up to foreign competition, this will further increase pressures to reduce costs, whereas at the same time, new banking and risk management techniques, as well as of new financial instruments and services may be imported (Claessens *et al.,* 2001). Agca, De Nicolo, and Detragiache (2007) asserts that financial sector reforms embody eight factors among which is the removing of bank entry barriers so as to improve efficiency the banking sector. Market-based banking sector reforms also have a positive impact on bank operational and allocative efficiency.

However, on the negative side it has been argued that government dominant control of the financial market adversely affect the efficiency with which banks and other financial institutions

are able to intermediate funds from savers to investors (McKinnon, 1973; Shaw,1973), since they interfere with the price mechanism, regulate entry of banks, and weaken or even eliminate market competition. According to the proponents of financial market reform, under these circumstances banks are not motivated to improve their performance by increasing the mobilization of deposits, improving the efficient allocation of loans and reducing overall operating costs. Stiglitz (2000), among others, has pointed out that financial reform as such does not solve the problem of asymmetric information. When financial markets become liberalized and competition is increased, this may lead to a reduction of relationship lending, since borrowers may have more opportunities and will look for the cheapest way of financing their investment. However, a reduction of relationship lending also destroys information capital and thereby increases asymmetric information (Boot, 2002). If this is the case, the allocation of funds by banks may actually become less efficient.

More competition in financial markets may also mean a reduction of profit margins and an increased financial fragility of banks. Hellmann, Murdock and Stiglitz (2000) pointed out that banking reform reduces the franchise value of banks, which makes them more prone to financial disruption and stimulates moral hazard behavior and risk taking in order to try to increase profits under the pressure of falling interest rate margins. Reduced margins may also stimulate banks to economize on screening and monitoring efforts and they may be more willing to opt for a gambling strategy when allocating loans, i.e. putting less emphasis on risk and more on profit. Thus, financial reform may trigger crises if it leads to excessive risk taking under the pressure of increased competition (Demirguc-Kunt and Detragiache, 1998). Increased risk taking in financial markets and the consequent increase in the number of failures of banks may in itself trigger bank runs (Diamond and Dybvig, 1983). Bank runs are another source of weakening the financial stability of banks, but this time even in a situation where some of them may be economically viable. Clearly, under these circumstances bank efficiency is hurt.

Financial analysts suggest ways to curb the adverse effects of banking reform on the stability and efficiency of banks to include the introduction bank regulation. Such regulations should reduce moral hazard behavior and risk taking by banks and should at least to some level bail-out depositors when their bank goes bankrupt. Such a deposit insurance system aims at reducing the

probability of bank runs taking place in times of financial distress. This is why, according to several researchers, banking reform in combination with a weak regulatory structure may have strongly adverse effects on growth (McKinnon, 1991; Mishkin, 1999; Andersen and Tarp, 2003).

II. BANKING REFORM AND COMPETITIVENESS

There is a general consensus that financial repression, the practice of controlling interest rates below their market clearing levels and rationing credit on non-price basis, creates competitive intermediary based financial markets (Reinhart and Tokatlidis, 2003) as cited in (Mwenda and Mutoti, 2011). The contestability of financial markets which financial liberalization facilitates increases the competitiveness of financial markets, which in turn leads to more effective delivery of their multiple functions. Economic theory suggests that performance measures such as the size of banking margins, interest spread, or profitability, do not necessarily indicate the competitiveness of a system. As such, these measures can be poor indicators of the degree of competition (Hauner and Peiris, 2008). As observed by Stiroh and Strahan (2003), competition could accelerate a decline in the population of banks in the banking sector. Omoruyi (1991), CBN (2004) and several financial sector analysts summarized the objectives of banking reform among others to include fostering competition in the provision of banking services.

III. BANKING REFORM AND ECONOMIC GROWTH

The works of Mckinnon (1973) and Shaw (1973) supports the preposition that a well-functioning banking sector, nurtured by sound banking sector policies, is a necessary condition for accelerating private investment, economic growth and development. Banking reform leads to economic growth through various transmission channels like encouraging private investment among others. In the works of Allen and Ndikumana (2000), financial development enhances allocative efficiency, reduces liquidity risk, and facilitates risk management by offering savers and investors investment alternatives for portfolio diversification. It also makes possible maturity transformation, the channeling of short term assets into more productive long term assets, all of which promote economic growth. Financial liberalization enhances economic growth by

influencing savings and investment through their effects on assets returns and the availability and allocation of credit.

2.3 EMPIRICAL LITERATURE

The literature reviewed is grouped into two; review on financial reform and performance and review on financial reform and the economy.

2.3.1 Review on Financial Reform and Bank Performance

Ikhide and Alawode (2001) study on Financial sector reforms, macroeconomic instability and the order of economic liberalization: The evidence from Nigeria. The study adopted the use of discriminant analysis to demonstrate the health of banks following the reforms of 1987 to 1993. They study revealed that the results from the implementation of the reforms was disappointing since it led to deterioration in the health of banks. However bank insolvency, high inflation and excessively high interest rates have become common phenomena in the economy. The study cautiously identifies a wrong sequencing process as a major factor in the poor performance of the financial sector reforms, but agrees that a lot more research needs to be done in this area.

Iganigan (2010), Evaluated the Nigerian financial sector reforms using the classical least square technique with emphasis on the banking sub-sector. The results show that the performance of the financial sector has been greatly influenced overtime by these reforms that began in 1986. The adoption of market determined cash reserve requirement caused cash intensity and domestic savings to increase by 5.54 and 5.00 percent respectively. The gradual increase in the capital base of these firms rekindled the public confidence in the sector by increasing savings by 3.6 percent. Also the findings support the view that financial liberalization promotes the efficiency of the financial intermediation process. The policy implications of these results is that the monetary authorities should direct their efforts towards achieving a positive interest rate regime, increasing the scope of financial reform arsenal including financial instruments and improving the regulatory framework.

Olajide, Asaolu, and Jegede (2011), examined the impact of financial reforms on banks' organizational performance in Nigeria between 1995 and 2004. It specifically determined the
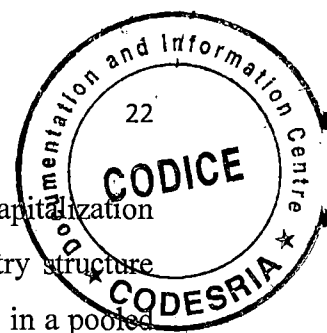
effects of policies of interest rates deregulation, exchange rate reforms and bank recapitalization on banks performance, and analyzed how banks internal characteristics and industry structure affect the performance of Nigeria banks. The study utilized panel data econometrics in a pooled regression, the result confirmed that the effects of government policy reforms, bank specific characteristics and industry structure has mixed effects on banks profitability level and net interest margin of Nigerian banks. Bank specific characteristics appear to have significant positive influence on banks profitability and efficiency performance of banks in Nigeria.

With the aim of assessing the effects of the financial sector reform on the profitability and efficiency of the Pakistani banking system, Hardy and Patti (2001) carried out a study on bank reform and bank efficiency in Pakistan. To assess these effects, profitability, cost and revenue efficiency frontiers were estimated using the Distribution Free Approach, from which can be derived certain measures of the efficiency of banking system relative to the best available practice. The results revealed that revenue performance of all banks, and especially the privatized banks, improved significantly, although costs also rose and relative performance across banks did not converge. Also the reform did not lead to a rise in overall profitability and it led to increase in both costs and revenue.

Nazir and Alam (2010) used the DEA Approach to analyze the impact of financial restructuring on the performance of Pakistani banks. Its objective was to evaluate the operating efficiency of 28 Pakistani commercial banks over a five year period i.e. 2003-2007, through the traditional method and Data Envelopment Analysis (DEA) approach. The results of the traditional approach suggest that privatization cannot help banks in improving their operating income. These results add further robustness to the findings of the DEA approach of measuring efficiency, which show that public banks are better able to cover their interest and non-interest expenses from their corresponding revenues.

Xiping and Yuesheng (n.d) studied banking efficiency in China, applying DEA and Tobit Analysis. The paper used Data Envelopment Analysis (DEA) and super-efficient DEA (SE-DEA) are employed to measure the efficiency of Chinese commercial banks. Incorporating Tobit regression analysis, the determinants of banking efficiency are investigated based on panel data.

Over all, the DEA results show relatively low average efficiency levels and state- owned banks are more inefficient than that of joint-equity banks. And Tobit regression indicates that bank size and ownership are the main influencing factors on banking efficiency, while little evidence suggest that the capital ratio can explain the banking efficiency levels.

Ahmed et. al, (2009) carried out a research on efficiency Dynamics and Financial reform: case study of Pakistani banks. The study used data sets of 20 domestic commercial banks of Pakistan, to measure the banking efficiency through Data Envelopment Analysis (DEA) malmquist index of Total factor productivity (TFP) from 1990 to 2005; the impact of reforms on banking sector was assessed. The result showed that financial sector reforms are successful in improving the efficiency of the domestic commercial banks role as intermediations in Pakistan.

Olaosebikan (2009) in surveying efficiencies of Nigerian banks before and after the minimum capital requirement increase investigates the efficiency of the Nigerian banking system between the years of 1999 and 2005. Data Envelopment Analysis (DEA) was used to evaluate bank efficiency and the main determinants are identified by using a Tobit model. While reforms imposed during the late 1990s have reduced the number of distressed banks, the efficiency of the banking system was volatile until the minimum capital requirement was imposed in 2004. The consolidation process that followed has strengthened the banking system and led to an increase in efficiency.

Okpara (2011) conducted an empirical analysis on bank reforms and the performance of the Nigerian banking sector. The researcher adopted a one sample t statistics using the population average as the test value. The findings revealed that apart from the reform period of financial liberalization which affected significantly virtually all the banking sector performance indicators and the financial deepening, the rest of the reforms made no significant impact on the performance variables. However, with the exception of the recapitalization reform exercise that started in 2004 which deteriorated financial deepening and made insignificant impact in all but return on equity which is drastically reduced, all other reforms exerted significantly on financial deepening. The merger and acquisition associated with the recapitalization reform were more or less a forced or compelled one, so un-spontaneous that it could not significantly improve the

efficiency and performance of the participant banks. In the light of this, the researcher sees the simultaneous consideration of all the items in the CAMEL acronym and undue interference from board members, political crisis, undercapitalization and fraudulent practices as a necessity while proposing a reform.

Balogun (2007) reviewed the perspective of banking sector reforms since 1970 to date. It notes four eras of banking sector reforms in Nigeria, viz.: Pre-SAP (1970-85), the Post-SAP (1986-93), the Reforms Lethargy (1993- 1998), Pre-Soludo (1999-2004) and Post-Soludo (2005-2006). Using both descriptive statistics and econometric methods, three sets of hypothesis were tested: firstly that each phase of reforms culminated in improved incentives; secondly that policy reforms which results in increased capitalization, exchange rate devaluation; interest rate restructuring and abolition of credit rationing may have had positive effects on real sector credit and thirdly that implicit incentives which accompany the reforms had salutary macroeconomic effects. The empirical results confirm that eras of pursuits of market reforms were characterized by improved incentives. However, these did not translate to increased credit purvey to the real sector. Also while growth was stifled in eras of control, the reforms era was associated with rise in inflationary pressures. Among the pitfalls of reforms identified by the study are faulty premise and wrong sequencing of reforms and a host of conflicts emanating from adopted theoretical models for reforms and above all, frequent reversals and/or non-sustainability of reforms. In concluding, the study notes the need to bolster reforms through the deliberate adoption of policies that would ensure convergence of domestic and international rates of return on financial markets investments.

2.3.2 Review on Financial Reforms and the Economy

Mwenda and Mutoti (2011) investigated the effects of market-based financial sector reforms on the competitiveness and efficiency of commercial banks, and economic growth, in Zambia. The study used the P-R method, or H measure of competition, to measure the degree of bank competitiveness and the results indicate the existence of a commercial bank market characterized by imperfect or monopolistic competition. A two-step procedure is used to evaluate the effects of financial sector reforms on bank cost efficiency. In step one a grand trans-log cost stochastic frontier equation is estimated to measure bank cost efficiency performance. In step two a cost efficiency regression equation is estimated by panel OLS method to evaluate the main

determinants of bank cost efficiency. The results indicate that, at the aggregate level, there has been a general increase in bank system cost efficiency over time. The findings show that significant factor determinants of bank cost efficiency are financial infrastructure development, and bank features including liquidity levels, profits, quality of loan portfolios, and type of bank ownership. Also an endogenous economic growth equation is estimated by the panel OLS method to evaluate the main determinants of economic growth and results show that bank cost efficiency; financial depth; a degree of economic openness, and the rate of inflation are the main determinants of economic growth. With the exception of Phase II policies and inflation, all of which have negative effects, the rest of the augments have positive impacts on economic growth.

Fadare (2010) analyzed the effect of banking sector reforms on economic growth in Nigeria over the period 1999 - 2009. Using the ordinary least square regression technique, we established that interest rate margins, parallel market premiums, total banking sector credit to the private sector, inflation rate, inflation rate lagged by one year, size of banking sector capital and cash reserve ratios account for a very high proportion of the variation in economic growth in Nigeria; and although there is a strong and positive relationship between economic growth and the total banking sector capital, the relationship between economic growth and other exogenous variables of interest rate margins, parallel market premiums, total banking sector credit to the private sector, inflation rate and cash reserve ratio reveal the wrong signs. The implication which emerges from the empirical results with regards to the wrong signs of these parameters is that theoretical expectations would only be valid when all conditions are normal. This outcome has important policy implications as market realities resulting from factors such as market inefficiencies, policy conflicts, information asymmetry and government interference in the interaction of market forces may produce results in direct contradiction to theoretical expectations.

Using descriptive statistics and Vector Autoregressive Model, Ogun and Akinlo (2011) measured the impact of financial sector reforms on the performance of the Nigerian economy. The findings of the study indicated that though financial reform has led financial depth, increase in credit to private sector, and growth of stock market activities, real interest rate is still negative and the performances of financial intermediaries were still largely inefficient. Analysis indicated that the

mean of performance indicators — saving rate, investment ratio and growth of real GDP were very low relative to pre-reform period. The correlation matrices also show that the correlation of financial indicators with performance indicators were mostly low or negative under reform. Moreover, evidence from the VAR analysis also showed that shocks to financial indicators (in most cases) had either negative or insignificant positive effect on the saving rate, investment and growth. These results suggest that financial sector reform has not actually improved the performance of the Nigerian economy. The poor performance of the economy under reform could be attributed to macroeconomic stability, poor sequencing of reform programme, structural bottlenecks and other non-financial factors.

2.3.3 Review on Financial Reforms and Competition

Hauner and Peiris (2008) conducted a study on Banking efficiency and competition in low income countries: the case of Uganda. This study systematically analyses the impact of the far-reaching banking sector reforms undertaken in Uganda on banking sector competition and efficiency. Using Panzar and Rosse (PR) models of banking competition and efficiency, the study observed that that the Ugandan banking system has become more competitive and efficient as a result of the far-reaching reforms embarked upon in the last few years. Moreover, on average, larger banks and foreign-owned banks are more efficient than others while smaller banks have fallen back in efficiency with the increase in competitive pressures.

SUMMARY OF EMPIRICAL LITERATURE

Authors/Year	Location	Nature of study	Nature of data	Methodology	Findings
Ikhide and Alawode (2001)	Nigeria	Financial sector reforms, macroeconomic instability and the order of economic liberalization.	panel	Discriminant Analysis	i Stabilization measures should precede financial sector reforms, in order to situate the reforms within a stable macroeconomic

					environment. ii financial liberalization has to be sequenced and properly timed
Iganigan (2010),	Nigeria	Evaluation of the Nigerian Financial Sector Reforms Using Behavioral Models	Pool	Classical Least Squares Techniques	i The adoption of market determined interest rates, and capitalization have triggered a significant realignment of financial depth, width and savings mobilization. ii As the government reduces her ownership of financial institutions, most financial development indicators perform better
Olajide, Asaolu, and Jegede (2011),	Nigeria	The impact of financial reforms on banks' organizational performance	Pool	Panel Data Regression	i Bank specific characteristic appear to have significant positive influence on bank's profitability and precede efficiency level ii Industry stricture variables appeared not to have contributed meaningfully to the profitability and efficiency performance of banks
Hardy and Patti (2001)	Pakistan	Bank Reform and Bank Efficiency in Pakistan	Time series	Distribution Free Approach	i Financial reform led to the increase in both revenue and cost

					ii Reform did not lead to overall rise in profitability nor a strong convergence in efficiency of banks
Nazir And Alam (2010)	Pakistan	The impact of financial restructuring on the performance of Pakistani banks	Panel	Data Envelopment Analysis (DEA)	i The efficiency of private banks is less than that of public banks
Xiping and Yuesheng (n.d)	China	Banking Efficiency in China: Application of DEA and Tobit Analysis	Panel	DEA, Super-efficient DEA and Tobit Regression	i Relatively low average efficiency levels and state-owned banks are more inefficient than that of joint-equity banks. ii Bank size and ownership are the main influencing factors on banking efficiency, while little evidence suggests that the capital ratio can explain the bank efficiency levels.
Ahmed et. al, (2009)	Pakistan	Efficiency Dynamics and Financial Reforms: Case Study of Pakistani Banks	Panel	DEA Malmquist Index of Total Factor Productivity (TFP)	i An increase in the TFP growth for the total sample and for the public banks. ii Reform is successful in improving the effectiveness and productivity of banks
Olaosebikan (2009)	Nigeria	Surveying efficiencies of Nigerian banks before and after the minimum capital requirement	Panel	DEA and Tobit Regression	i Efficiency fluctuated during the first part of the period and improved during the recent years, a period

		increase			associated with the increase in minimum capital requirement ii Differences in bank efficiency are explained by problematic loans and bank size.
Okpara (2011)	Nigeria	Bank reforms and the performance of the Nigerian banking Sector: an empirical analysis	Time series	T-statistics	i Apart from the reform period of financial liberalization which affected significantly virtually all the banking sector performance indicators and the financial deepening, the rest of the reforms made no significant impact on the performance variables
Balogun (2007)	Nigeria	Banking sector reforms and the Nigerian economy: performance, pitfalls and future policy options	Time series	Descriptive Statistics	i Market reforms were characterized by improved incentives ii Reforms era was associated with rise in inflationary pressures

Mwenda and Mutoti (2011)	Zambia	Financial Sector Reforms, Bank Performance and Economic Growth: Evidence from Zambia	Time series	Panzar and Rosse and Stochastic Frontier Approach	i The results show that reforms adopted had significant positive effects on bank cost efficiency ii Bank cost efficiency, financial depth, financial sector, the degree of economic openness, and rate of inflation were significant determinants of economic growth.
Fadare (2010)	Nigeria	Recent Banking Sector Reforms and Economic Growth in Nigeria	Time series	Ordinary Least Squares (OLS)	i Contrary to theoretical expectation only the total banking sector capital and reserves had the correct signs
Ogun and Akinlo (2011)	Nigeria	Financial sector reforms and the performance Of the Nigerian economy	Panel	Descriptive statistics and Vector Autoregressive Model	i Shocks to financial indicators either had negative or insignificant positive effect on the saving rate investment and growth during reform
Hauner and Peiris (2008)	Uganda	Banking efficiency and competition in low income countries: the case of Uganda	Panel	Panzar and Rosse and DEA	i Competition has significantly increased and has been associated with a rise in efficiency of the sector

2.4 LIMITATION OF PREVIOUS STUDIES

The various literature reviewed shows that several studies like Iganigan (2010), Olajide, Asaolu, and Jegede (2011), Hardy and Patti (2001), focused on financial sector reforms as a whole while few studies like Xiping and Yuesheng (n.d), Ahmed et al (2009) specifically studied banking sector reforms and used bank size and ownership to determine the efficiency of banks. While this study based on the features of Nigeria banks used Capital, Asset, Management, Earning and Liquidity (CAMEL) approach to evaluate the determinants of efficiency.

More so, the studies that used the DEA model were mostly on other countries. The only study on banking reforms and banking efficiency that used the DEA model as at the time of this study is (Olaosebikan, 2009) which used only year 2005 to represent post consolidation period while the consolidation took off in 2005 hence it is rather too early to conclude if the reform was successful/ unsuccessful. Hence, this study covers this gap by covering beyond 2005 and provide a ranking procedure for banks by adopting the modified DEA; Super- Efficient DEA (SE-DEA).

CHAPTER THREE
METHODOLOGY

3.1 THEORETICAL FRAMEWORK

In economic theory there are algebraic and geometric characterizations of production plans that can unambiguously be regarded as non- wasteful (efficient). A production vector y $\in$ Y is efficient if there is no yi $\in$ Y such that yi $\geq$ y yi $\neq$ y. this concept means a production vector y is efficient if there is no other feasible production vector yi that generates as much output as y using no additional inputs. This philosophy is the basis of illustrative production possibility frontier (PPF), from which the methods of analysis used in this study originate.

The commonly used approaches in the measurement of efficiency using a frontier efficiency technique are classified into the parametric and non-parametric approaches. The parametric approach on one hand comprises of three major approaches namely the Stochastic Frontier Approach (SFA), the Distribution Free Approach (DFA), and the Thick Frontier Approach (TFA). On the other hand, Data Envelopment Analysis (DEA) and Free Disposal Hull (FDH) are non-parametric approaches. While both techniques require the specification of a production frontier, the former involves the specification and econometric estimation of a statistical or parametric function/frontier, the non-parametric approach provides a piecewise linear frontier by enveloping the observed data points.

Charnes, Cooper and Rhodes (1978), provided the original Data Envelopment Analysis (DEA) Constant Returns to Scale (CRS) model, later extended to Variable Returns to Scale (VRS) by (Banker, Charnes, and Cooper, 1984). These 'standard' models are known by the acronyms CCR and BCC respectively. DEA assumes that all the firms use the same level of technologies to produce output from a given set of inputs. DEA is used to measure the efficiency of each Decision Making Units (DMUs) that is obtained as a maximum of a ratio of weighted outputs to weighted inputs. This denotes that the more the output produced from given inputs, the more efficient is the production. The weights for the ratio are determined by a restriction that the similar ratios for every DMU have to be less than or equal to unity. The analysis under DEA is concerned with understanding how each DMU is performing relative to others, the causes of

inefficiency, and how a DMU can improve its performance to become efficient. In that sense, DEA calculates the relative efficiency of each unit in relation to all other units by using the actual observed values for the inputs and outputs of each DMU. It also identifies, for inefficient DMUs, the sources and level of inefficiency for each of the inputs and outputs.

The main trade-off between parametric and nonparametric approaches concerns their assumptions on random errors and the functional form of the cost frontier. While DEA fails to distinguish between inefficiency and random errors, it does not presume a particular functional form of the frontier. Parametric approaches, in turn, distinguish between random errors and inefficiency, but do so along the lines of somewhat arbitrary assumptions about their respective distributions and, in addition, impose a particular functional form, which, if misspecified, risks overstating inefficiency. Data Envelopment Analysis (DEA) is more adept than parametric approaches at describing frontiers as opposed to central tendencies. Instead of fitting a regression plane through the center of the data, DEA constructs a piecewise linear surface that connects the set of the best-practice producers, yielding a convex production possibilities set. The DEA method has been widely applied in the empirical estimation of financial institutions, health care, and education sectors' efficiency worldwide. (See Hauner and David 2008, Abdel-Baki 2010, Sufian 2010, Ahmed et al 2009, Olaosebikan 2009) therefore, this study will adopt the DEA approach with constant returns to scale.

DEA allows multiple outputs and inputs without requiring pre-assigned weights. Multiple inputs and outputs are reduced to single 'virtual' input and single 'virtual' output by optimal weights. The efficiency measure is then a function of multipliers of the 'virtual' input-output combination. Also it can be applied even when the sample size is small. However, the basic problem of DEA is that of selection of input and output variables. To overcome this, two approaches have arguably emerged based on the activity of banks. The production approach models banks as using labour and physical capital to produce services for account holders, approximated by the number of transactions. This approach, however, fails to capture the economically more interesting role of a bank as financial intermediary and does not include interest expense, the largest portion of total costs. Therefore, this study as most others uses the intermediation approach, originally developed by Sealey and Lindley (1977) and models financial institutions as

intermediating funds between savers and investors. Here, the production process of a bank is modeled as follows: Banks use capital and labor to transform deposits into loans and different types of securities. Hench, following similar studies, (Isik and Hassan, 2002; Havrylchyk, 2006, Olaosebikan 2009), this study employs the intermediation approach.

Another weakness of standard DEA is that it leaves the efficient units of the product set undifferentiated. To overcome this problem, an extension of the basic DEA methodology, called Super Efficiency DEA (SE-DEA) model was provided by Anderson and Peterson (Xiping and Yuesheng, n.d). These deleted domain models exclude the DMU under evaluation from the reference set, which means in the case of an efficient DMU, from the efficient frontier of the production set. The effect of this is to shrink the production set, which allows efficient DMUs to become super-efficient and to have different super-efficiency scores greater than one. Among other things, this permits a ranking of efficient DMUs. Scores for inefficient DMUs remain the same as in the standard models. This study employs the SE-DEA to provide a ranking procedure for banks.

3.2 MODEL SPECIFICATION

3.2.1 MODEL 1

The relative efficiency of a bank is defined as the ratio of weighted sum of outputs to the weighted sum of inputs available to that bank. The mathematical expression of this relationship is as follows:

$$E_j = \frac{\sum_{r=1}^{s} U_r Y_{rj}}{\sum_{i=1}^{m} V_i X_{ij}} \quad \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \quad (1)$$

Where:

E_j = the efficiency ratio of bank j

S = the number of outputs of bank

U_r = the weight of output r

Y_{rj} = the amount of r output produced by bank j

M = the number of inputs of a bank

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V_i = the weight of input i; and

$X_{ij\,s}$ is the amount of i input used by bank j

The efficiency scores are based on the intermediation approach with two outputs (loans, and investments) and three inputs (capital, deposits, and labour). As in most recent studies, (e.g. Olaosebikan 2009; Pasiouras, 2008), we adopt the intermediation approach. All variables are measured in thousands of Nigerian Naira (NN), and Labour is measured in numbers of employees. Determining a common set of weights and their appropriate allocation could be difficult as inputs and outputs can be calculated and entered in Equation (1) without standardization. However, different banks may value outputs and inputs in a different way and assign different weights. Charnes *et al.* (1978) addressed this issue and proposed the following linear programming form of Equation (1) to calculate efficiency by using DEA:

$$MaxEj = \frac{\sum_{r=1}^{s} UrYrj}{\sum_{i=1}^{m} ViXij} \quad \text{.. (2)}$$

Such that

$E_j \leq 1,$

$\sum^{s} U_r = 1, \sum^{m} V_i = 1$ and

$_{r=1} \qquad _{i=1}$

$U_r, V_i \geq 0$

The first inequality assures that the efficiency ratio of bank j cannot exceed 1, while the sum of weights of inputs and outputs of banks should be equal to 1. Moreover, the assigned weights should also be greater than 0 and each input and output used to calculate the relative operating efficiency of the bank must have some positive weight. There are two ways to obtain DEA efficiency. The first way is to combine all the DMUs from all the years under study, and the second way is to run the model for each year separately. Since this study analyzed the structural change, we used the second way and apply the model for each year separately.

3.2.2 MODEL 2

The main weakness of standard DEA is that it leaves the efficient units of the product set undifferentiated. To overcome this problem, an extension of the basic DEA methodology, called Super efficiency DEA was used

$$MaxEj = \frac{\sum_{r=1}^{s} Ur Y_{rj}}{\sum_{i=1}^{m} ViX_{ij}} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (3)$$

Such that

$E_j \leq 1$,

$\sum_{r=1, r\neq0}^{s} Ur=1$, $\sum_{i=1, i\neq0}^{m} V_i=1$ and

U_r, $V_i \geq 0$

Comparing model (1) and (2), we find that the core idea of SE-DEA is to exclude the Decision-making unit (DMU) from the reference set when its own relative efficiency is being evaluated. The advantage of SE-DEA over the conventional DEA method is that SE-DEA provides a ranking procedure for all DMUs, not only the inefficient DMUs, but the efficient ones as well. Model 1 and 2 captured objective 1.

3.2.3 MODEL 3

As defined in equations 1 to 3, the DEA score falls between the interval 0 and 1 $(0 < h^* \leq 1)$ making the dependent variable a limited dependent variable. Following among others Das and Ghosh (2006) and Pasiouras (2008), Tobit regression model instead of an ordinary Least Squares (OLS) regression is used since the distribution of the disturbances and dependent variables is not normal. The standard Tobit model can be defined as follows for observation (bank) i :

$$y_i^* = \beta\,'x_i + \varepsilon_i$$
$$y_i = y^* \text{ if } y_i^* \geq 0 \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (4)$$

and $y_{i=0}$, otherwise

Where:

xi is a vector of explanatory variables and β is the set of parameters to be estimated. $\varepsilon_i \sim N(0, \sigma 2)$ denotes the error term. y_i^* is a latent variable and y_i is the efficiency score obtained from the

DEA model. By using the efficiency scores as the dependent variables, we estimate the following model:

$$\gamma jt = \beta_0 + \beta_1 E2TA + \beta_2 \text{ TL2TA} + \beta_3 \text{ TOC/TOI} + \beta_4 \text{ NIM/TA} + \beta_5 \text{ NL2C} \dots\dots\dots\dots\dots\dots\dots\dots (5)$$

Where:

γjt is the technical efficiency of the jth bank in period t obtained from the DEA model,

E2TA= Equity Capital to Total Assets   (Capital)

TL2TA= Ratio of total loans less loan-loss provisioning to total assets   (Asset quality)

TOC/TOI= Total operating costs over total operating income   (Management)

NIM/TA= Net interest margin over total assets   (Earnings)

NL2C=Non-deposit liabilities to cash and investment securities   (Liquidity)

3.3 JUSTIFICATION OF THE MODEL

DEA has the ability to deal with multiple inputs and outputs; it is difficult to give recommendations about the efficiency of firms without using the DEA approach and it requires no prior assumption about a specific functional form linking inputs and outputs. It can also be applied even when the sample size is small.

3.4 DATA AND THEIR FEATURES

The principal sources of the data are the audited annual balance sheet of these banks from the Nigeria Deposit Insurance Corporation (NDIC) and their various websites. The statistical packages used were; DEA Solver and Stata.

3.5 DEFINITION OF MODEL VARIABLES

CAPITAL: The capital adequacy ratio given by; equity (shareholders fund) to total assets measures the solvency state of the bank. When the capital ratio declines, the risk that the deposit insurance fund might be required to pay insured depositors rises, while the higher the capital adequacy ratio, the higher the level of protection available to depositors and the more solvent the industry.

ASSET QAULITY: Asset quality is an important issue for most banks because it is an indicator of the "health" status of banks'. A proxy for asset quality is the ratio of total loans and advances less loan-loss provisioning to total assets. It is expected that banks' should be able to recover all debts. Therefore, a low asset quality is characterized by high, loan default rate, which ultimately culminates into distress. A high ratio of total loans and advances less loan-loss provisioning to total assets is an indication of inefficiency in credit administration.

MANAGEMENT: This is the measure of the extent to which management uses resources at its disposal to generate income through the delivery of financial services to the public. A proxy for management efficiency is total operating costs over total operating income. This ratio shows the amount of resources spent to generate a unit of income and provides an indicator of management's ability to operate a sound and efficient organization.

EARNINGS STABILTY: Earnings stability indicator variable measures the management capacity to sustain growth over time. It is measured by the variable Return on Assets (ROA) which is expressed as net interest margin over total assets.

ROA = Profit After Tax x 100

   Total Assets

Generally, a high ratio is an indication of efficient use of company's assets and vice versa in any given financial year.

LIQUIDITY: Liquidity is measured as the ratio of non-deposit liabilities to cash and investment securities. A lack of liquidity subjects a bank to vulnerability resulting from sudden changes in funds movement. Sudden swings in interest rates, which affect the return on loans or cost of deposits, lack of diversification in a bank's loan portfolio (loan concentration), or excessive concentration on a particular class of loans are all factors that may infringe on the liquidity of a bank.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF THE RESULTS

4.1 EMPIRICAL RESULTS AND DISCUSSIONS

This study originally proposed to use the entire commercial banks that were in existence in the country at the time of its conduct (24 in total). However, due to the challenges of accessing the required data for the pre and post consolidation periods, the study was constrained to adopt ten (10) commercial banks. These include Union bank, United Bank for Africa (UBA), Access bank, Zenith bank, and First Bank of Nigeria (FBN), Diamond bank, Wema bank, Fidelity bank, Guaranty Trust Bank (GTB), and First City Monument Bank (FCMB).

To investigate the structural changes in the pre and post consolidation periods, the following equation was estimated:

$$MaxEj = \frac{\sum_{r=1}^{s} UrYrj}{\sum_{i=1}^{m} ViXij} \qquad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

To obtain the structural change, equation 6 was regressed separately on a yearly basis for all the banks. The abridged result for the estimation of equation 6 for the first four years which comprise of the years before the consolidation period is represented in table 2 below. The detailed results are found in the appendix.

Table 4.1: Abridged Result obtained from regressing equation 6 (pre-consolidation period)

No.	DMU	2002	2003	2004	2005
1	Union	0.508655(49)	0.719271(28)	0.746002(25)	1
2	UBA	1	1	0.911166(9)	1
3	Access	0.738906(26)	1	1	1
4	Zenith	0.877373(12)	1	1	0.991431(1)
5	FBN	1	1	0.764293(24)	0.243719(76)
6	Diamond	0.611522(39)	0.138278(86)	0.10373(90)	0.516079(48)
7	Wema	0.831076(17)	0.742509(26)	1	1

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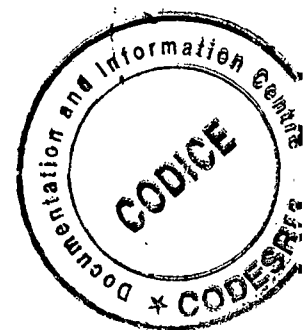
8	Fidelity	1	1	1	0.784439(22)
9	GTB	0.301717(70)	0.54558(45)	1	0.550784(45)
10	FCMB	1	1	1	0.345702(65)
Average Score		0.786925	0.814565	0.852519	0.743215

Table 4.1 shows the efficiency scores and percentage inefficiency score for the 10 banks. The banks with the coefficient of 1 are efficient; the banks with the coefficient below 1 are inefficient, with their respective percentage inefficiency score in bracket.

In 2002, GTB was the least efficient of all the banks with 70% inefficiency score. This implies that for it to improve its efficiency, it has to decrease its input by 70%. In 2003 and 2004, DIAMOND was the most inefficient bank with 86% and 90% inefficiency scores respectively. This also implies excess inputs; hence it will have to decrease its inputs by 86% and 90% for the years 2003 and 2004 respectively for it to become efficient. In 2005, FBN recorded the highest inefficiency score at 76%. This implies a general improvement in bank efficiency, given that in the previous year, the highest inefficiency score was 90% (14% reduction). It will also, have to decrease its present inputs by 76% to attain efficiency. All the inefficient banks would have to decrease its inputs by its percentage inefficiency score in order to become efficient.

The result shows that the efficiency of banks improved each year. In 2003, the number of efficient banks improved from 4 in the previous year to 6. While the number of efficient banks remained at 6 in 2004 however, it declined to 4 in 2005. It can be seen that no bank was efficient throughout the pre-consolidation years under review. The banks that performed best were found to be efficient in at most 3 of the 4 years. These were UBA, FIDELITY and FCMB. UNION and GTB were observed to be efficient in 2005 and 2004 respectively only. DIAMOND was not efficient throughout the 4 pre consolidation years.

The overall average efficiency score reveals varying efficiency levels. It increased in 2002, 2003, and 2004, it however declined in 2005. The year 2005 records the lowest with an average of 74%. These results are illustrated graphically in the graphs found in the appendix.

Table 4.2: Abridged Result obtained from regressing equation 6 (post-consolidation period)

No.	DMU	2006	2007	2008	2009	2010
1	Union	0.15159(85)	0.335083(66)	0.261777(74)	0.513588(49)	1
2	UBA	0.475177(52)	1	0.899342(10)	1	1
3	Access	1	0.141294(86)	1	1	0.695983(30)
4	Zenith	0.761423(24)	0.918349(8)	1	0.991691(1)	1
5	FBN	0.381555(62)	0.315563(68)	0.185822(84)	1	0.622701(38)
6	Diamond	1	0.86139(14)	0.328272(67)	1	0.830605(17)
7	Wema	1	1	1	1	1
8	Fidelity	0.641884(36)	1	0.43433(57)	1	0.511619(49)
9	GTB	1	0.721403(28)	0.460085(55)	0.990792(1)	0.923972(8)
10	FCMB	0.792702(21)	1	0. 446416(55)	0.802912(20)	1
Average Score		0.720433	0.729308	0.600604	0.929898	0.858488

Table 4.2 above shows the result of the post consolidation period. The result shows that the number of efficient banks remained stagnant at 4 in 2006 and 2007 while in 2008 it declined to 3. Although in the pre-consolidation period, no bank was recorded to be efficient throughout the period. WEMA bank was recorded to be efficient throughout the post consolidation period. We observed that the least efficient bank was efficient at least once in the post-consolidation era as against none in the pre-consolidation period. GTB and UNION remained efficient only once as in the pre–consolidation period. DIAMOND improved from zero efficiency to being efficient in 2 of the post-consolidation years. Although, the efficiency of FCMB and FIDELITY dropped from 3 periods in the pre-consolidation era to 2 in the post-consolidation era, while that of FBN dropped from 2 to 1.

Inefficiency results from the use of more inputs to produce a certain output, hence, as in the pre-consolidation period, inefficient banks are to decrease their inputs by the percentage inefficiency score in the bracket in order to become efficient.

Comparing the result of the pre consolidation with that of the post-consolidation period, one may say that the efficiency of banks improved post-consolidation. At individual bank level, there was an improvement in efficiency; for instance, WEMA was found to be efficient all through the post-consolidation years, unlike in the pre-consolidation period where bank like DIAMOND was observed to be inefficient all through. Also at the general level, the post-consolidation era recorded the highest overall average efficiency of 92% in 2009.

Further, to rank the banks in their order of efficiency, the following equation was estimated:

$$MaxEj = \frac{\sum_{r=1}^{s} Ur Y_{rj}}{\sum_{i=1}^{m} Vi X_{ij}} \quad \text{.. (7)}$$

The abridged result obtained from regressing equation 7, model II is shown on table 3 below.

Table 4.3: Abridged result obtained from equation 7 model II

No.	DMU	2002	2003	2004	2005	2006	2007	2008	2009	2010
1	Wema	6	7	1	1	1	1	1	1	1
2	UBA	1	1	7	1	8	1	4	1	1
3	Access	7	1	1	1	1	10	1	1	8
4	FCMB	1	1	1	9	5	1	6	9	1
5	Fidelity	1	1	1	6	7	1	7	1	10
6	Zenith	5	1	1	5	6	5	1	7	1
7	FBN	1	1	8	10	9	9	10	1	9
8	GTB	10	9	1	7	1	7	5	8	6
9	Diamond	8	10	10	8	1	6	8	1	7
10	Union	9	8	9	1	10	8	9	10	1

The result obtained from estimating equation 7 in Table 4.3 above presents a ranking procedure for the ten banks. This shows that for the 9 years under study (pre and post consolidation), WEMA bank could be ranked the best performing bank among the ten banks. It was efficient for 7 years out of the 9 years under study. The second most efficient bank is UBA followed by ACCESS both of which were efficient in 6 years of the entire study period. However, 3 banks

were efficient only 2 times out of the 9 years under study; these are GTB, DIAMOND and UNION bank though UNION ranked the least.

Surprisingly, some of the banks that were able to make up the ₦25billon capitalization on their own and a prior viewed as best performing banks fell short of the expectation of being ranked among the best. For instance, FBN was ranked 7th, ZENITH bank 6th and GTB 8th. Ironically, banks like FBN is rated one of the three largest banks in Nigeria. GTB was rated the Best Bank in Nigeria at the 2009 Euromoney Awards in 2009. Also, ZENITH was awarded the best global bank in Nigeria in 2008 by the African bankers' award and Euromoney. In 2006, UNION received the Euromoney award as the best bank in Nigeria.

To determine the factors that affect bank efficiency the following equation was estimated:

$$\gamma jt = \beta_0 + \beta_1 E2TA + \beta_2\ TL2TA + \beta_3\ TOC/TOI + \beta_4\ NIM/TA + \beta_5\ NL2C \quad \dots\dots\dots\dots\dots\dots\dots \quad (8)$$

Table 4.4: Abridged result obtained from the estimation of equation (8) Model III

Banks	Capital	Assets	Management	Earnings	Liquidity
Union	-2.312 (-4.455)	.001 (2.914)	.0525 (.085)	.314 (1.408)	-.676 (-2.038)
UBA	3.203 (6.039)	.000 (3.838)	.102 (1.190)	-.098 (-2.891)	.336 (4.675)
Access	1.760 (1.615)	.000 (.860)	.284 (1.837)	.065 (.913)	.242 (.043)
Zenith	1.363 (2.291)	.001 (3.720)	.219 (3.675)	.210 (3.623)	-.101 (-2.231)
FBN	-1.797 (-3.966)	-.923 (-.475)	-.061 (-1.203)	.034 (1.187)	.408 (8.135)
Diamond	5.624 (3.280)	-.000 (-1.010)	-.258 (-.941)	-.005 (-2.966)	-.154 (-.632)
Wema Bank	-3.206 (-6.297)	.002 (14.708)	.301 (7.662)	.025 (5.807)	.594 (4.173)
Fidelity	-3.431 (-1.706)	.687 (.244)	.512 (1.609)	.115 (1.014)	.542 (2.571)
GTB	5.530 (4.334)	.001 (4.843)	-.504 (-1.056)	-.207 (-4.080)	-.989 (-2.053)
FCMB	-4.958 (-2.481)	.000 (1.307)	-.522 (.316)	.463 (4.123)	.305 (1.454)
	8	5	2	6	7

The table obtained from regressing equation (8) shows the coefficient and the $|Z|$ value in bracket of CAMEL parameters for the ten banks. The detailed result is shown in the appendix.

The result shows that adequate Capital is a determinant factor of efficiency. This could be seen as it is significant for 8 out of the 10 banks. However, 4 out of the 8 significant banks had negative coefficients. This reveals that most banks increase their capital base above optimal. The negative coefficients imply that increasing the capital base above its optimal will lead to a decline in efficiency. This agrees with the Basle committee stipulation of minimum capital adequacy ratio of 8% to meet the credit level.

The result for Assets quality was significant for 5 banks out of the 10 banks. For WEMA bank, this was 14.708. The extents to which assets are deployed in earning assets influence the efficiency of banks.

The result also shows that Management is not an influencing factor on banks efficiency as the variable; management was only significant for only 2 banks.

The result shows Earnings as a significant determinant factor for efficiency of banks, as the variable was found significant in 6 banks. 3 of the 6 significant banks had negative coefficients implying that increasing earnings above optimal while holding other CAMEL parameters constant will lead to a decline in efficiency (inefficiency).

The result obtained shows that Liquidity is an important determinant of efficiency, as it was observed to be significant in 7 banks. Also three of the significant value had a negative sign which suggests that increase in liquidity should be done along side other CAMEL parameters. Excess liquidity will retard earnings.

The result however shows that no single CAMEL parameter can capture the holistic efficiency of banks and this corresponds with the work of (Wirnkar and Tanko n.d) that ranked the factors of the acronym CAMEL to CLEAM in order of their importance.

4.2 Test of Hypotheses

Our hypotheses stated in their null forms in section 1.5 with the alternative forms implied are evaluated thus:

4.2.1 Test of Hypothesis I

H_0: There is no structural change in the pre and post- consolidation periods.

H_1: There is structural change in the pre and post-consolidation periods.

DECISION:

The result obtained shows that there exist structural changes in the pre and post consolidation period and efficiency improved more post- consolidation. Therefore, we reject the null hypothesis and accept the alternate hypothesis that there is a structural change in the pre and post-consolidation periods.

4.2.2 Test of Hypothesis II

H_0: The CAMEL variables do not determine the efficiency of banks.

H_1: The CAMEL variables determine the efficiency of banks.

DECISION:

The Z-value for Capital, Assets, Earnings and Liquidity are statistically significant for most of the banks at 5% level of significance. We therefore, reject the null hypothesis that CAMEL variables do not determine the efficiency of banks. Hence, we conclude that the CAMEL variables determine the efficiency of banks.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATION

5.1 Summary of findings

The quest to know the outcome of the reforms undertaken in the banking sector in Nigeria necessitated this study. This study was motivated by the fact that the banking sector has been undergoing reforms since 1986 with the challenge to engender an efficient banking system; however, the impact of the several reforms in the banking sector has been harder to discern. Without undermining the factors that enhance efficiency, this study also sought to determine the influencing factors of efficiency using the CAMEL parameters. Realizing that some banks were only in existence after the recent reform, 10 banks that existed prior and after the consolidation era were used for this analysis.

We evaluated the impact of banking sector reforms on banks efficiency using three models. Model I focused on using the DEA to analyze the efficiency of banks prior and after the consolidation while model II ranked the banks in their order of efficiency and model III focused on the determinants of efficiency.

We found out in model I that even though the banks showed various levels of efficiency, it could still be said on a general note that the efficiency of banks improved in the post-consolidation period, notwithstanding the global economic meltdown and financial crisis that rocked many economies including those of the world powers. However, the result of the ranking procedure did not satisfy our a priori expectation as the large banks were ranked among the least efficient banks. We found out also in model III that the Z value for Capital, Asset, Earnings, and Liquidity were significant for most of the banks which shows that they are determinants of efficiency while Management was insignificant for most of the banks implying that the management of a bank does not really determine its efficiency. Our results suggest that stringent measures should be maintain on sticking to the stipulated capital adequacy ratio, earnings and liquidity ratio as the excess of it, is detrimental to the efficiency of banks.

5.2 Conclusion

This study sought to evaluate the impact of the Nigeria banking sector reforms on banks efficiency. Firstly, a non-parametric approach, in the form of Data Envelopment Analysis (DEA) and its modified model Super Efficiency DEA are applied. Using efficiency measures derived from DEA estimation we evaluated the determinants of Nigerian banks efficiency by adopting the Tobit regression model approach. The result of this study shows that there exist fluctuations in the efficiency of banks, and generally, bank efficiency improved post-consolidation, some yet remained inefficient. Also the result shows that the CAMEL variables determine the efficiency of banks. We therefore on this note suggest that the CAMEL variables be considered when proposing subsequent reforms and it should not be raised above its statutory optimal.

5.3 Policy Implications/Recommendations

Based on the findings of this study the following policy implications are observed, and equally the following policy options are recommended to enhance the efficiency/ wellbeing of banks and the economy at large.

The policy thrust of the recent reform whose key ingredient is the consolidation of banks has left the banks with fluctuation in their efficiency. While there is improvement in the efficiency of banks, some banks still remained inefficient. This may not be unconnected to the global recession and financial crisis that rocked many economies, including those of the economic giants. This implies that the world has gone global; hence Nigeria banks can be vulnerable to banking crises emanating from other countries through infectivity. This underscores the imperative for the country to embark on banking reforms on regular basis.

Before the global crisis, the banks were already engulfed by several interdependent factors including critical gaps in regulatory framework and uneven supervision and enforcement, unstructured governance and management processes at the CBN/weaknesses within the CBN. This implies that the Central Bank of Nigeria as the regulatory authority in charge of banks should not fall short of its functions of engendering a viable regulatory framework. This implies that appropriate strategies should be mapped out to strengthen the management process of CBN and regular/even supervision of commercial banks should be conducted.

The fact that banks are awarded best banks and achieved the recent ₦25billion capital base requirement on their own does not necessarily make them efficient. Our study reveals that the size of bank does not determine its efficiency as banks like UNION, among the 3 largest banks in the country was presented for the second round of the consolidation. This implies that some inputs of the banks are left dormant and not utilized; hence adequate/appropriate use of input is required.

Capital adequacy, liquidity, Earning, Asset quality are major influencing factors on efficiency while Management is not a major determinant of efficiency. We recommend that these parameters should be considered when proposing a reform that is geared towards improving the efficiency of banks. The increment of any of the CAMEL parameter above optimal will not improve efficiency but rather lead to a decline in efficiency. Hence the CBN should ensure that banks do not increase its capital base, assets, earnings and liquidity above statutory optimal.

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APPENDIX 1

Data Envelopment Analysis (DEA) results from the regression of model 1, from 2002-2010

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2002

8.7

No.	DMU	Score	Rank	1/Score	Reference set (lambda)					
1	UNION	0.508655	9	1.965967	FBN	0.678806	FIDELITY	0.853866	FCMB	
2	UBA	1	1	1	UBA	1				
3	ACCESS	0.738906	7	1.353352	FBN	0.259964	FCMB	0.690429		
4	ZENITH	0.877373	5	1.139765	UBA	0.429015	FCMB	9.51E-02		
5	FBN	1	1	1	FBN	1				
6	DIAMON	0.611522	8	1.635265	UBA	0.413193	FBN	0.986344		
7	WEMA	0.831076	6	1.203259	UBA	0.266903	FCMB	0.120429		
8	FIDELITY	1	1	1	FIDELITY	1				
9	GTB	0.301717	10	3.314364	UBA	0.687671	FBN	0.795179		
10	FCMB	1	1	1	FCMB	1				

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2003

No.	DMU	Score	Rank	1/Score	Reference set (lambda)					
1	UNION	0.719271	8	1.390296	FBN	0.674595	FIDELITY	0.531098		
2	UBA	1	1	1	UBA	1				
3	ACCESS	1	1	1	ACCESS	1				
4	ZENITH	1	1	1	ZENITH	1				
5	FBN	1	1	1	FBN	1				
6	DIAMON	0.138278	10	7.231786	ZENITH	0.216396	FBN	0.666589	FIDELITY	0.85£
7	WEMA	0.742509	7	1.346785	ZENITH	0.669985	FBN	4.05E-02	FIDELITY	0.1(
8	FIDELITY	1	1	1	FIDELITY	1				
9	GTB	0.545588	9	1.832886	ZENITH	0.44351	FBN	1.194965		
10	FCMB	1	1	1	FCMB	1				

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2004

No.	DMU	Score	Rank	1/Score	Reference set (lambda)			
1	UNION	0.746002	9	1.340478	ZENITH	0.953703	FIDELITY	0.55474
2	UBA	0.911166	7	1.097495	ZENITH	1.15175	GTB	1.51E-03
3	ACCESS	1	1	1	ACCESS	1		
4	ZENITH	1	1	1	ZENITH	1		
5	FBN	0.764293	8	1.308399	ZENITH	0.189615	FIDELITY	0.943837

6	DIAMON	0.10373	10	9.640422	ZENITH	2.839204	FIDELITY	0.264582
7	WEMA	1	1	1	WEMA	1		
8	FIDELITY	1	1	1	FIDELITY	1		
9	GTB	1	1	1	GTB	1		
10	FCMB	1	1	1	FCMB	1		

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2005

No.	DMU	Score	Rank	1/Score	Reference set (lambda)			
1	UNION	1	1	1	UNION	1		
2	UBA	1	1	1	UBA	1		
3	ACCESS	1	1	1	ACCESS	1		
4	ZENITH	0.991431	5	1.008643	UBA	0.076649	ACCESS	0.666525
5	FBN	0.243719	10	4.103091	UBA	1.292683		
6	DIAMON	0.516079	8	1.937687	UBA	1.169492		
7	WEMA	1	1	1	WEMA	1		
8	FIDELITY	0.784439	6	1.274797	UBA	1.004878		
9	GTB	0.550784	7	1.815593	UBA	1.745763		
10	FCMB	0.345702	9	2.892664	UBA	0.458233	ACCESS	0.123447

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2006

No.	DMU	Score	Rank	1/Score	Reference set (lambda)					
1	UNION	0.15159	10	6.596754	ACCESS	1.121086	DIAMON	0.87972		
2	UBA	0.475177	8	2.10448	ACCESS	0.716426	WEMA	0.765624		
3	ACCESS	1	1	1	ACCESS	1				
4	ZENITH	0.761423	6	1.31333	DIAMON	0.021524	WEMA	0.455466		
5	FBN	0.381555	9	2.620856	ACCESS	1.135734	DIAMON	0.798922	WEMA	0.174
6	DIAMON	1	1	1	DIAMON	1				
7	WEMA	1	1	1	WEMA	1				
8	FIDELITY	0.641884	7	1.557914	DIAMON	0.524971	GTB	0.232288		
9	GTB	1	1	1	GTB	1				
10	FCMB	0.792702	5	1.261508	ACCESS	0.187567	DIAMON	0.125956	WEMA	0.7756(

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2007

No.	DMU	Score	Rank	1/Score	Reference set (lambda)	
1	UNION	0.335083	8	2.984333	FCMB	2.218085
2	UBA	1	1	1	UBA	1

nazite4sure@yahoo.com, Okorie, M. C., 2013

No.	DMU	Score	Rank	1/Score				
3	ACCESS	0.141294	10	7.077455	UBA	1.22E-02	FCMB	0.909661
4	ZENITH	0.918349	5	1.088911	UBA	0.538963	FCMB	7.76E-02
5	FBN	0.315563	9	3.168935	UBA	0.159363	FCMB	2.334533
6	DIAMON	0.86139	6	1.160915	WEMA	1.439094	FIDELITY	0.161911	FCMB
7	WEMA	1	1	1	WEMA	1		
8	FIDELITY	1	1	1	FIDELITY	1		
9	GTB	0.721403	7	1.386187	FCMB	0.771429		
10	FCMB	1	1	1	FCMB	1		

1.8

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2008

No.	DMU	Score	Rank	1/Score	Reference set (lambda)			
1	UNION	0.261777	9	3.820049	ZENITH	3.60E-03	WEMA	4.76899
2	UBA	0.899342	4	1.111924	ZENITH	0.72531	WEMA	0.307824
3	ACCESS	1	1	1	ACCESS	1		
4	ZENITH	1	1	1	ZENITH	1		
5	FBN	0.185822	10	5.381485	ZENITH	0.275184	WEMA	4.632931
6	DIAMON	0.328272	8	3.046252	ACCESS	0.646864	WEMA	1.296351
7	WEMA	1	1	1	WEMA	1		
8	FIDELITY	0.43433	7	2.302399	ACCESS	0.546522	WEMA	1.37959
9	GTB	0.450085	5	2.221801	WEMA	1.340426		
10	FCMB	0.446416	6	2.240061	ACCESS	9.79E-02	WEMA	1.59943

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2009

No.	DMU	Score	Rank	1/Score	Reference set (lambda)			
1	UNION	0.513588	10	1.947086	UBA	1.441489		
2	UBA	1	1	1	UBA	1		
3	ACCESS	1	1	1	ACCESS	1		
4	ZENITH	0.991691	7	1.008378	UBA	0.181977	FBN	0.8418
5	FBN	1	1	1	FBN	1		
6	DIAMON	1	1	1	DIAMON	1		
7	WEMA	1	1	1	WEMA	1		
8	FIDELITY	1	1	1	FIDELITY	1		
9	GTB	0.990792	8	1.009294	UBA	1		
10	FCMB	0.802912	9	1.245467	UBA	0.287128	DIAMON	0.624101

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O) Returns to Scale = Constant (0 =< Sum of Lambda < Infinity)

2010

No.	DMU	Score	Rank	1/Score	Reference set (lambda)						
1	UNION	1	1	1	UNION	1					
2	UBA	1	1	1	UBA	1					
3	ACCESS	0.695983	8	1.436816	UNION	4.26E-02	UBA	1.004233			
4	ZENITH	1	1	1	ZENITH	1					
5	FBN	0.622701	9	1.605907	WEMA	1.090164					
6	DIAMON	0.830605	7	1.203942	UNION	0.129109	UBA	6.91E-02	WEMA	3.16E	
7	WEMA	1	1	1	WEMA	1					
8	FIDELITY	0.511619	10	1.954579	WEMA	2.25E-02	FCMB	0.967925			
9	GTB	0.923972	6	1.082284	UNION	8.19E-02	UBA	0.644399	FCMB	0.703	
10	FCMB	1	1	1	FCMB	1					

Appendix 2

Regression results obtained from regressing model II

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2002

Rank	DMU	Score
1	FCMB	1
1	FIDELITY	1
1	UBA	1
1	FBN	1
5	ZENITH	0.877373
6	WEMA	0.831076
7	ACCESS	0.738906
8	DIAMON	0.611522
9	UNION	0.508655
10	GTB	0.301717

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2003

Rank	DMU	Score
1	FCMB	1
1	FIDELITY	1
1	UBA	1
1	ACCESS	1
1	ZENITH	1

Rank	DMU	Score
1	FBN	1
7	WEMA	0.742509
8	UNION	0.719271
9	GTB	0.545588
10	DIAMON	0.138278

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2004

Rank	DMU	Score
1	FCMB	1
1	GTB	1
1	FIDELITY	1
1	ACCESS	1
1	ZENITH	1
1	WEMA	1
7	UBA	0.911166
8	FBN	0.764293
9	UNION	0.746002
10	DIAMON	0.10373

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2005

Rank	DMU	Score
1	WEMA	1
1	UNION	1
1	UBA	1
1	ACCESS	1
5	ZENITH	0.991431
6	FIDELITY	0.784439
7	GTB	0.550784
8	DIAMON	0.516079
9	FCMB	0.345702
10	FBN	0.243719

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2006

Rank	DMU	Score
1	GTB	1
1	WEMA	1

1	DIAMON	1
1	ACCESS	1
5	FCMB	0.792702
6	ZENITH	0.761423
7	FIDELITY	0.641884
8	UBA	0.475177
9	FBN	0.381555
10	UNION	0.15159

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2007

Rank	DMU	Score
1	FCMB	1
1	FIDELITY	1
1	UBA	1
1	WEMA	1
5	ZENITH	0.918349
6	DIAMON	0.86139
7	GTB	0.721403
8	UNION	0.335083
9	FBN	0.315563
10	ACCESS	0.141294

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2008

Rank	DMU	Score
1	WEMA	1
1	ZENITH	1
1	ACCESS	1
4	UBA	0.899342
5	GTB	0.450085
6	FCMB	0.446416
7	FIDELITY	0.43433
8	DIAMON	0.328272
9	UNION	0.261777
10	FBN	0.185822

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2009

Rank	DMU	Score
1	FIDELITY	1
1	WEMA	1
1	UBA	1
1	ACCESS	1
1	DIAMON	1
1	FBN	1
7	ZENITH	0.991691
8	GTB	0.990792
9	FCMB	0.802912
10	UNION	0.513588

Model Name = DEA-Solver Pro5.0/ CCR(CCR-O)

2010

Rank	DMU	Score
1	FCMB	1
1	UNION	1
1	UBA	1
1	WEMA	1
1	ZENITH	1
6	GTB	0.923972
7	DIAMON	0.830605
8	ACCESS	0.695983
9	FBN	0.622701
10	FIDELITY	0.511619

Appendix 3

Regression results obtained from regressing model III

(1) UNION BANK
```
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\UNION.xls"$
--> TOBIT;Lhs=EFF;Rhs=C,A,M,E,L$
Normal exit from iterations. Exit status=0.

+--------------------------------------------------+
| Limited Dependent Variable Model - CENSORED      |
| Maximum Likelihood Estimates                     |
| Model estimated: Feb 09, 2013 at 11:17:17AM.     |
| Dependent variable                      EFF      |
| Weighting variable                     None      |
| Number of observations                    9      |
| Iterations completed                      5      |
| Log likelihood function          11.13124        |
```

```
| Threshold values for the model:                   |
| Lower=      .0000      Upper=+infinity             |
| ANOVA  based fit measure =    .906960             |
| DECOMP based fit measure =    .939181             |
+---------------------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
	Primary Index Equation for Model				
C	-2.31166239	.51886525	-4.455	.0000	.08402182
A	.00059076	.00020273	2.914	.0036	406.860401
M	.05247676	.61576256	.085	.9321	.57180131
E	.31389015	.22289176	1.408	.1591	1.98626039
L	-.676148D-06	.331764D-06	-2.038	.0415	170115.200
	Disturbance standard deviation				
Sigma	.07024661	.01655728	4.243	.0000	

```
| Matrix: Las |
| [6,4]       |
```

(2) UBA

```
--> RESET
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\UBA.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT$
Normal exit from iterations. Exit status=0.
```

```
+---------------------------------------------------+
| Limited Dependent Variable Model - CENSORED       |
| Maximum Likelihood Estimates                      |
| Model estimated: Feb 09, 2013 at 11:33:06AM.      |
| Dependent variable               EFF              |
| Weighting variable               None             |
| Number of observations             9              |
| Iterations completed               5              |
| Log likelihood function      12.08698             |
| Threshold values for the model:                   |
| Lower=      .0000      Upper=+infinity             |
| ANOVA  based fit measure =    .907471             |
| DECOMP based fit measure =    .859399             |
+---------------------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
	Primary Index Equation for Model				
CAPITALA	3.20279750	.53033344	6.039	.0000	.09662659
ASSETQUA	.00057312	.00014932	3.838	.0001	449.327716
MANAGEME	.10167035	.08543375	1.190	.2340	.81259195
EARNINGS	-.09784288	.03384337	-2.891	.0038	1.34020943
LIQUIDIT	.335856D-05	.718474D-06	4.675	.0000	118976.262
	Disturbance standard deviation				
Sigma	.06316931	.01488915	4.243	.0000	

```
Matrix: Las
[6,4]
```

(3) ACCESS BANK PLC

```
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\ACCESS.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT$
Normal exit from iterations. Exit status=0.
```

```
+----------------------------------------------+
| Limited Dependent Variable Model - CENSORED  |
| Maximum Likelihood Estimates                 |
| Model estimated: Feb 09, 2013 at 00:05:25PM. |
| Dependent variable              EFF          |
| Weighting variable              None         |
| Number of observations            9          |
| Iterations completed              5          |
| Log likelihood function    -.1519940E-02     |
| Threshold values for the model:              |
| Lower=      .0000     Upper=+infinity        |
| LM test [df] for tobit=      .012[  5]       |
| ANOVA  based fit measure =    .253315        |
| DECOMP based fit measure =    .245832        |
+----------------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
Primary Index Equation for Model
CAPITALA	1.76011966	1.09000078	1.615	.1064	.16952739
ASSETQUA	.00041083	.00047754	.860	.3896	337.988837
MANAGEME	.28368075	.15442448	1.837	.0662	1.05384526
EARNINGS	.06519352	.07143918	.913	.3615	1.52929103
LIQUIDIT	.242380D-07	.566021D-06	.043	.9658	111785.222
Disturbance standard deviation
Sigma	.24201160	.05704268	4.243	.0000	

```
Matrix: Las
[6,4]
```

(4) ZENITH BANK PLC

```
--> RESET
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\ZENITH.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT$
Normal exit from iterations. Exit status=0.
```

```
+----------------------------------------------+
| Limited Dependent Variable Model - CENSORED  |
| Maximum Likelihood Estimates                 |
| Model estimated: Feb 09, 2013 at 00:07:37PM. |
| Dependent variable              EFF          |
| Weighting variable              None         |
| Number of observations            9          |
```

```
| Iterations completed                    5        |
| Log likelihood function         9.797235        |
| Threshold values for the model:                 |
| Lower=       .0000      Upper=+infinity          |
| ANOVA  based fit measure =    2.145436           |
| DECOMP based fit measure =     .670976           |
+----------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
	Primary Index Equation for Model				
CAPITALA	1.36286742	.59494500	2.291	.0220	.14506982
ASSETQUA	.00068620	.00018445	3.720	.0002	366.815158
MANAGEME	.21940699	.05969570	3.675	.0002	1.30304359
EARNINGS	.20974740	.05788685	3.623	.0003	2.46810331
LIQUIDIT	-.101323D-05	.454129D-06	-2.231	.0257	308463.167
	Disturbance standard deviation				
Sigma	.08147002	.01920267	4.243	.0000	

```
+-------------+
| Matrix: Las |
| [6,4]       |
+-------------+
```

(5) FIRST BANK PLC

```
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\FBN.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT$
Normal exit from iterations. Exit status=0.
```

```
+--------------------------------------------------+
| Limited Dependent Variable Model - CENSORED      |
| Maximum Likelihood Estimates                     |
| Model estimated: Feb 09, 2013 at 00:09:24PM.     |
| Dependent variable                  EFF          |
| Weighting variable                 None          |
| Number of observations                9          |
| Iterations completed                  5          |
| Log likelihood function         9.927603         |
| Threshold values for the model:                  |
| Lower=       .0000      Upper=+infinity           |
| ANOVA  based fit measure =    1.043876           |
| DECOMP based fit measure =     .944523           |
+--------------------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
	Primary Index Equation for Model				
CAPITALA	-1.79714321	.45318565	-3.966	.0001	.14215174
ASSETQUA	-.923039D-04	.00019436	-.475	.6349	410.213667
MANAGEME	-.06051619	.05030655	-1.203	.2290	1.40084081
EARNINGS	.03395982	.02859792	1.187	.2350	2.58061449
LIQUIDIT	.408202D-05	.501804D-06	8.135	.0000	218341.339
	Disturbance standard deviation				
Sigma	.08029841	.01892652	4.243	.0000	

```
Matrix: Las
[6,4]
```

(6) DIAMOND BANK PLC

```
--> RESET
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\DIAMON.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT$
Normal exit from iterations. Exit status=0.
```

```
+---------------------------------------------+
| Limited Dependent Variable Model - CENSORED |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 09, 2013 at 00:11:27PM.|
| Dependent variable              EFF         |
| Weighting variable              None        |
| Number of observations          9           |
| Iterations completed            5           |
| Log likelihood function    1.376981         |
| Threshold values for the model:             |
| Lower=     .0000      Upper=+infinity        |
| ANOVA  based fit measure =    .630713        |
| DECOMP based fit measure =    .612286        |
+---------------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
	Primary Index Equation for Model				
CAPITALA	5.62413550	1.71455912	3.280	.0010	.15058968
ASSETQUA	-.00034828	.00034476	-1.010	.3124	383.321879
MANAGEME	-.25750772	.27367022	-.941	.3467	.70268060
EARNINGS	-.00537354	.00181201	-2.966	.0030	-15.4132769
LIQUIDIT	-.154060D-05	.243918D-05	-.632	.5276	59288.3363
	Disturbance standard deviation				
Sigma	.20764271	.04894186	4.243	.0000	

```
Matrix: Las
[6,4]
```

(7) WEMA BANK PLC

```
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\WEMA BANK.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT;Pds=0
    ;RandomEffects$
Normal exit from iterations. Exit status=0.
```

```
+---------------------------------------------+
| Limited Dependent Variable Model - CENSORED |
| Maximum Likelihood Estimates                |
| Model estimated: Feb 09, 2013 at 00:13:38PM.|
| Dependent variable              EFF         |
| Weighting variable              None        |
| Number of observations          9           |
```

```
| Iterations completed                    5      |
| Log likelihood function        8.161128        |
| Threshold values for the model:               |
| Lower=      .0000      Upper=+infinity         |
| LM test [df] for tobit=      .000[  5]         |
| ANOVA  based fit measure =   2.805568          |
| DECOMP based fit measure =    .714117          |
+------------------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
Primary Index Equation for Model					
CAPITALA	-3.20566623	.50907253	-6.297	.0000	.12323852
ASSETQUA	.00190216	.00012933	14.708	.0000	419.425904
MANAGEME	.30065128	.03923955	7.662	.0000	1.94620064
EARNINGS	.02509457	.00432158	5.807	.0000	-4.80820231
LIQUIDIT	.593775D-06	.142298D-06	4.173	.0000	121082.274
Disturbance standard deviation					
Sigma	.09771204	.02303095	4.243	.0000	

```
+-------------+
| Matrix: Las |
| [6,4]       |
+-------------+
```

(8) FEDELITY BANK PLC

```
--> RESET
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\FIDELITY BANK.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT;Pds=0
    ;RandomEffects$
Normal exit from iterations. Exit status=0.
```

```
+--------------------------------------------------+
| Limited Dependent Variable Model - CENSORED      |
| Maximum Likelihood Estimates                     |
| Model estimated: Feb 09, 2013 at 00:16:02PM.     |
| Dependent variable              EFF              |
| Weighting variable              None             |
| Number of observations            9              |
| Iterations completed              5              |
| Log likelihood function      2.649899            |
| Threshold values for the model:                  |
| Lower=      .0000      Upper=+infinity            |
| ANOVA  based fit measure =    .598547            |
| DECOMP based fit measure =    .476735            |
+--------------------------------------------------+
```

Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
Primary Index Equation for Model					
CAPITALA	-3.43094963	2.01144910	-1.706	.0881	.15405957
ASSETQUA	.687009D-04	.00028212	.244	.8076	434.654662
MANAGEME	.51185680	.31820586	1.609	.1077	.81497705
EARNINGS	.11463847	.11306594	1.014	.3106	3.35603689
LIQUIDIT	.542053D-05	.210868D-05	2.571	.0102	93495.9378
Disturbance standard deviation					

```
Sigma            .18025699      .04248698     4.243     .0000
```

```
+------------------+
| Matrix: Las      |
| [6,4]            |
+------------------+
```

(9) GTB BANK PLC

```
RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\GTBANK.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT;Pds=0
    ;RandomEffects$
Normal exit from iterations. Exit status=0.
```

```
+--------------------------------------------------+
| Limited Dependent Variable Model - CENSORED      |
| Maximum Likelihood Estimates                     |
| Model estimated: Feb 09, 2013 at 00:18:12PM.     |
| Dependent variable                     EFF       |
| Weighting variable                    None       |
| Number of observations                   9       |
| Iterations completed                     5       |
| Log likelihood function         6.362109         |
| Threshold values for the model:                  |
| Lower=      .0000      Upper=+infinity            |
| ANOVA  based fit measure =     .793644           |
| DECOMP based fit measure =     .782292           |
+--------------------------------------------------+
```
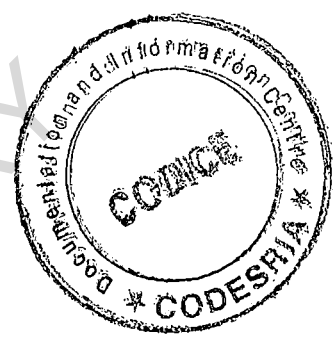
Variable	Coefficient	Standard Error	b/St.Er.	P[|Z|>z]	Mean of X
Primary Index Equation for Model						
CAPITALA	5.52995928	1.27585952	4.334	.0000	.19813374
ASSETQUA	.00146381	.00030228	4.843	.0000	446.464082
MANAGEME	-.50410822	.47746084	-1.056	.2911	.58042675
EARNINGS	-.20661932	.05063941	-4.080	.0000	2.45176124
LIQUIDIT	-.988981D-05	.481730D-05	-2.053	.0401	23438.0000
Disturbance standard deviation						
Sigma	.11933275	.02812700	4.243	.0000	

```
+------------------+
| Matrix: Las      |
| [6,4]            |
+------------------+
```

(10) FCMB BANK PLC

```
--> RESET
--> RESET
--> READ;FILE="C:\Users\Noah\Documents\AFRIK\FCMB.xls"$
--> TOBIT;Lhs=EFF;Rhs=CAPITALA,ASSETQUA,MANAGEME,EARNINGS,LIQUIDIT;Pds=0
    ;RandomEffects$
Normal exit from iterations. Exit status=0.
```

```
+---------------------------------------------------+
| Limited Dependent Variable Model - CENSORED       |
| Maximum Likelihood Estimates                      |
| Model estimated: Feb 09, 2013 at 00:19:55PM.      |
| Dependent variable                    EFF         |
| Weighting variable                    None        |
| Number of observations                   9        |
| Iterations completed                     5        |
| Log likelihood function          2.709043         |
| Threshold values for the model:                   |
| Lower=      .0000      Upper=+infinity             |
| LM test [df] for tobit=          .008[  5]         |
| ANOVA  based fit measure =       .750311          |
| DECOMP based fit measure =       .579375          |
+---------------------------------------------------+
```

```
+---------+---------------+-----------------+---------+---------+----------+
|Variable | Coefficient   | Standard Error  |b/St.Er. |P[|Z|>z] | Mean of X|
+---------+---------------+-----------------+---------+---------+----------+
           Primary Index Equation for Model
CAPITALA      -4.95765679     1.99827408      -2.481    .0131     .15405957
ASSETQUA       .00036641       .00028027       1.307    .1911    434.654662
MANAGEME      -.52165909       .31612161      -1.650    .0989     .81497705
EARNINGS       .46309503       .11232536       4.123    .0000    3.35603689
LIQUIDIT       .304603D-05     .209487D-05     1.454    .1459   93495.9378
           Disturbance standard deviation
Sigma          .17907631       .04220869       4.243    .0000
```

Matrix: Las
[6,4]