BANKING REGULATION AND SUPERVISION IN NIGERIA: AN ANALYSIS OF THE EFFECTS OF BANKING REFORMS ON BANK PERFORMANCE AND FINANCIAL STABILITY

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List of Abbreviations

AMCON	Asset Management Corporation of Nigeria
BCBS	Basel Committee on Banking Supervision
BCC	Banker, Charnes, and Cooper
BIS	Bank of International Settlement
BRIC	Brazil, Russia, India, China
CAC	Corporate Affairs Commission
CALCS	Capital Adequacy, Asset Quality, Liquidity, Compliance and Systems Control
CAMELS	Capital Adequacy, Asset Quality, Management, Earnings, Liquidity and Sensitivity to Market Risk
CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
CBN	Central Bank of Nigeria
CCR	Charnes, Cooper, and Rhodes
CMI	Chiang Mai Initiative
CRS	Constant Returns to Scale
DEA	Data Envelopment Analysis
DMBs	Deposit Money Banks
DMU	Decision Making Unit
ECAIs	External Credit Assessments Institutions
FCA	Financial Conduct Authority
FSA	Financial Services Authority
FSNs	Financial Safety Nets
Five Cs	Capacity, Character, Condition, Credit History, Collateral
GDP	Gross Domestic Product
GFC	Global Financial Crisis (2007-2009)
IADI	International Association of Deposit Insurers
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund

KYC	Know Your Customer
LCR	Liquidity Coverage Ratio
NDIC	Nigerian Deposit Insurance Corporation
NPL	Non-Performing Loans
NSFR	Net Stable Funding Ratio
PRA	Prudential Regulation Authority
RBS	Risk-Based Supervision
ROA	Return on Assets
ROE	Return on Equity
SE	Scale Efficiency
SIFI	Systemically Important Financial Institution
U.K	United Kingdom
U.S	United States of America
VaR	Value-at-Risk
VRS	Variable Returns to Scale

Acknowledgements

Dedication

This piece of research is dedicated to my parents Professor Longmas Sambo Wapmuk and Mrs Elizabeth Petkwap Wapmuk. It is impossible to thank you enough, my prayer is that the good Lord continues to bless, sustain and provide for you. I forever remain in your debt.

To Maama, my lovely wife, I could not have achieved this without your love, patience, and encouragement. Thank you for holding fort and for being my rock.

To Zemnaan, my lovely daughter, thank you for the motivation to see this work through.

Declaration

This is to declare that this thesis is my original work and no part has been submitted for a degree to any other University or Institution. I certify that to the best of my knowledge; this thesis does not infringe upon anyone's copyright nor violate any propriety rights. I confirm that I have clearly acknowledged materials from the work of other people included in this thesis, in accordance with the Salford Business School referencing guidelines. I also declare that all the findings of this thesis have not been falsified or embellished.

Abstract

This study analyses the effects of banking regulation and supervision on the performance and stability of Nigerian deposit money banks (DMBs) over the period of 2000 – 2013. Research in the area of banking regulation and supervision has gained considerable attention since the episode of the global financial crisis that started in the second half of 2007. It is against the background that both international and national regulators are continuously introducing new rules and guidelines for banking institutions to ensure sound banking systems that this study analyses the Nigerian experience. On that account, the Nigerian banking sector went through two banking reforms in 2005 and 2009 and this study employs a mixed methods approach to ascertain the effects of the reforms on the performance of Nigerian deposit money banks. This thesis adopts the use of content analysis of interview responses to examine the initiatives employed by both Nigerian regulators and bank managements towards ensuring healthy banking practices. More so, the DEA window analysis is employed in this thesis to trace the efficiency level of individual deposit money banks through the 2005 and 2009 banking reforms and the global financial crisis. While multiple regression estimations are adopted to ascertain the effects of capital adequacy, asset quality, management quality, earning ability, liquidity, sensitivity to risk, bank size, and GDP on bank efficiency, bank performance, and financial stability. The results suggest that the two Nigerian reforms led to a general increase in the performance and efficiency of Nigerian DMBs. However, the 2005 banking reforms was unable to shield the Nigerian banking sector from the adverse effect of the global financial crisis. Additionally, evidence suggests that Nigerian DMBs recovered in the post-global financial crisis period in reaction to regulatory initiatives. The results also show that resolution techniques adopted by Nigerian regulators prevented the failure of several Nigerian DMBs during the global financial crisis. This also found that DMBs fortified their internal control practices in line with the 2009 banking to reduce the build-up of non-performing loans as it was the case after the 2005 banking reforms when there was excess liquidity. However, even as the reforms led to increased efficiency scores and performance, the results show that capital injections whether in the form of capital requirement increase or bailouts do not guarantee sustained efficiency and stability. To that end, this study recommended increased surveillance of DMBs and adoption of qualitative and statistical assessments of bank performance.

Chapter One: Introduction and Rationale for Study

1.1   Introduction

The financial turmoil that started in the second half of 2007 has stirred discussions concerning the performance of banks and in general the regulation and supervision of banking systems. The financial turmoil put banks in the spotlight, as banks were accused of either creating or fuelling the financial crisis, and thus their performance has been under intense scrutiny (Nguyen, Roca, & Sharma, 2014). To that end, the global financial crisis brought to light the fact that banks do not always act in ways that spur economic growth and development.

Banks are not just institutions that facilitate payments; they play significant roles in channelling funds to vital sections of the economy and as such, contribute towards economic growth. They play important roles in fostering economic development and growth which makes them unique. The banking sector is the nerve centre of any modern economy because a well-functioning banking system has the potential of absorbing major financial shocks that lead to financial crisis, while also providing a platform for strengthening economic systems of countries (Shah & Jan 2014).

Given that a sound and well-functioning banking sector is a powerful apparatus for economic growth. The banking sector has been the focus of policy makers due to its invaluable significance (Wu, Ting, Lu, Nourani & Kweh, 2016). Therefore, the importance of banks in the economy and the need to maintain financial stability makes a case for their heavy regulation and supervision. To this end, the banking sector is one of the most regulated sectors in the world (Chortareas, Girardone, and Ventouri, 2012).

However, banking systems do not always function in beneficial ways that foster the growth of the economy. The preceding statement is true because banking institutions are subject to market failures. The recent episode of the global financial crisis highlighted the vulnerability of banking institutions and the need to review regulations that guide the operations of banks (Milne, 2014). These inherent risks attached to banking make a case for their regulation and supervision. On that account, policy makers and regulators reconfigured regulatory

structures, while new regulations are being created as responses to the global financial crisis (Wyneersch, Hopt, & Ferrarin, 2012). In spite of the fact that most jurisdictions and international committees of regulators have been engaging in some form of regulatory revisions, even in periods leading to the global financial crisis. Numerous studies have fingered weaknesses in financial regulation and supervision as one of the factors that led to the episode of the global financial crisis (Levine, 2010; Barth, Caprio & Levine, 2012; Manlagnit, 2015). Therefore, regulatory change does not inevitably guarantee the efficiency and stability of financial institutions.

Consequent on the specialness of banking institutions to economic development and the inability of regulation to protect them from the adverse effects of the recent global financial crisis; it is crucial to understand the failures of the past regulatory initiatives to chart a course for future banking and financial stability. To be specific, the Nigerian banking sector went through two noteworthy regulatory reforms (2005 banking reforms and 2009 banking reforms) that transformed the Nigerian banking landscape. On that account, this study embarks on the evaluation of the efficiency, performance, and stability of Nigerian deposit money banks from the period of 2000 – 2013 to ascertain the extent to which these reforms improved or derailed the Nigerian banking sector.

The Central Bank of Nigeria (CBN) announced a major reform agenda for the Nigerian banking sector on 6 July 2004. CBN assessments of the Nigerian banking sector in the pre-2005 banking reforms period suggested summarised the major problems in the industry as: weak corporate governance, late or non-publication of annual reports, gross insider abuses, insolvency caused by negative capital adequacy ratios and low levels of shareholders' funds that had been completely eroded by operating losses, weak capital base, and over-dependence on public sector deposits and neglect of small and medium class savers. Hence, the issues and weaknesses informed the decision of Nigerian regulators to consolidate and strengthen the Nigerian banking sector to meaningfully protect deposits, play significant developmental roles in the economy and become an efficient and active player in the African and global financial system. Elaborate presentation of all the elements of the 2005 banking reforms is done in the next chapter. However, two main elements of the reforms were the requirement that money deposit banks (DMBs) have a minimum regulatory capital of N25 billion before the end of December 2005, and consolidation of banking institutions through mergers and acquisitions. The 2005 banking reforms led to the reduction in the number of Nigerian DMBs

to 25 from 89 and later to 24. The 89 DMBs were relatively small with a capital base of N2bn in the pre-2005 banking reforms period (NDIC, 2004; CBN, 2006).

Regulatory reports after the 2005 reforms indicate that apart from the huge capital base of DMBs that survived, other benefits accrued to the Nigerian banking sector. The increase in branch network, unshackling of Nigerian DMBs from reliance on public sector funds, and increased liquidity and total assets levels which equipped DMBs to finance bigger projects within the oil, gas, telecommunication and real estate sectors (CBN, 2007, NDIC, 2007). Although the above indicates the positives of the 2005 reforms, the bailout of eight DMBs in 2009 and the decision to embark on another set of reforms in 2009 suggest that the 2005 reforms may not have eliminated the issues that motivated regulators to engage in the reforms. More so, the episode of the global financial crisis or lack of adequate supervision could also be responsible for the resolution to further reform DMBs. The uncertainty that surrounds the deep issues that influenced the initiative to engage in the 2009 banking reforms and the role played by the global financial crisis, therefore, is the focus of this study.

The 2005 banking reforms was not a reaction to any economic or financial crisis but were undertaken to make the Nigerian banking sector more efficient (Sanusi, 2012). Nonetheless, Nigerian regulators initiated the 2009 reforms largely because of the weaknesses identified during the periodic stress tests of DMBs that include depreciating capital levels, high levels of non-performing loans, and weak corporate governance practices (CBN, 2008; NDIC, 2008). To be specific, Sanusi, (2012) and the Oxford Business Group (2013) opined that the 2009 banking reforms were initiated in response to the global financial crisis and the inability of the 2005 banking reforms to adequately shield the Nigerian banking sector from the adverse effect of the crisis. Moreover, the broad objectives of the 2009 reform include: enhancing the quality of DMBs; establishing financial stability; enabling healthy financial sector evolution; and ensuring the financial sector contributes to the real economy. The 2009 reforms also jettisoned the universal banking model and mandated DMBs to hold regulatory capital based on the type of business they operate and the locations they covered. On that account, the regulatory capital of DMBs with international operations was set at N100bn, N25bn for national DMBs and N10bn for regional DMBs. Additionally, supervision was to be risk-focused, and strict enforcements of corporate governance principles were among the main elements of the reforms (CBN, 2009; NDIC, 2009). On account of the above, an examination of the events that led to the initiation of the 2009 banking reforms and the extent to which it has been able to reverse the effects of the global financial crisis is necessary. To

that end, investigating the extent to which these reforms strengthened the Nigerian banking sector and impacted efficiency, performance and financial stability is the focus of this research.

Furthermore, in the two years to 2006, the assets of the banking sector more than doubled from N3.2trn ($20.16bn) to N6.56trn ($41.33bn). However, following the episode of the global financial crisis, the Nigerian Stock Exchange plummeted by 70% in 2008 and 2009, and Nigerian DMBs disclosed a massive increase in the ratio of non-performing loans from 6.3% to 27.6% in the year ending 2009. Notwithstanding the immediate cause of the drop in the value of stocks on the NSE can be linked to global factors (global financial crisis). Home-Grown faults in the areas of corporate governance and risk management aggregated the effect on banks, as a result of "widespread insider abuse and improper related party lending (IMF, 2013; Oxford Business Group, 2013).

To be specific, the Nigerian banking sector is an important part of the Nigerian economy. The combined assets of Nigerian deposit money banks as it 2013 stood at N21.3trn ($134.19bn), or 57% of GDP. However, the reach of deposit money banks remains shallow, and financial intermediation to the real economy is inhibited with penetration as loans to GDP is at a mere 32% as at 2012, compared to 90% in South Africa. More so, only about 20% of the population of nearly 170 million Nigerians are banked, with roughly 25 million active accounts that include duplicate account-holders (Oxford Business Group, 2013). This indicates the potential of the Nigerian banking sector and why it should be nurtured with well-defined regulations and legislation to eliminate problems caused by market imperfections. Hence, the Nigerian banking sector and the events that transpired should be studied with the goal of understanding past mistakes and failures.

This study dwells only on Nigerian DMBs because they operate under the same conditions and they are regulated and supervised by the same agencies/authorities. Nigerian DMBs also operate the same accounting framework, experience the same technological changes, are patronised by the same type of customers and are exposed to the same opportunities. On account of the above, the Nigerian banking sector is a unique case, and a study centred on the reforms initiated by Nigerian regulators in quick succession is worth investigating. Three different techniques have been adopted in this study to extensively ascertain if Nigerian regulatory initiatives (2005 and 2009 banking reforms) improved or derailed the efficiency, performance and stability of Nigerian deposit money banks.

Given the importance of the Nigerian banking sector, it is reasonable to project that an efficient and profitable banking sector may aid ensure an effective financial system which will translate to economic growth and development. In this light, Levine (1998) and Sufian, Kamarudin, & Nassir (2016) are of the notion that the efficiency of financial intermediaries affects the economic growth of countries, while bank (financial intermediation) insolvencies could lead to systemic crisis and consequently negative implications on the economy. So, efficiency is fundamental for successful long-term business operations on all levels in all business operations (Geisslar, Mew, Weber, & Steiner, 2015). The basic concept of efficiency is that it measures how well organisations transform their inputs into outputs. An organisation is said to be efficient if it can achieve set goals and inefficient if it fails to achieve such goals. Accordingly, an organisation's goal is assumed to be cost minimization of production. Therefore, any waste of input is avoided, so there is no idleness in the utilisation of resources. More so, efficient organisations are able to effectively allocate resources in efficient ways relative to the constraints imposed by the structure of input and output markets, relative to whatever goals attributed to the products (Fare, Grosskopf, Lovell, 1985; Fare, Grosskopf, Norris, & Zhang, 1994; Fadzlan, Sufian & Kamarudin, 2014).

A wide variety of models and techniques have been utilised to investigate the spectrum of efficiency related issues in a wide range of locations. However, as already intimated, this study only focuses on the Nigerian banking sector with the view of ascertaining whether regulatory initiatives have improved or impeded efficiency. The efficiency estimation of banking institutions is suited for ascertaining the best and worst practice institutions (Berger and Humphrey, 1997). Over the last three decades, data envelopment analysis (DEA) has emerged as a capable mathematical and analytical tool. It is used to measure and gauge the performance of a set of similar peers (Cooper, Seiford, & Zhu, 2011). DEA has been extensively and efficaciously applied to a broad array of fields such as banking, hospital management, military, education, universities, and country studies (Emrouznejad, Parker, & Tavares, 2008; Cooper et al., 2011). To that end, this study adopts an extended version of the DEA approach called DEA windows analysis to examine the Nigerian banking sector as it went through the 2005 banking reforms, 2009 banking reforms, and the global financial crisis. The window analysis approach treats the same organisation in a different time as another unit and compares the performance of one unit not only against the performance of other organisations in the same time but also against that of the same unit in other times. This approach is useful when different organisations perform otherwise and at the same time, the

organisations perform differently depending on the period (Itoh, 2002). The DEA window approach is therefore utilised in this study because of the different methods (consolidation through mergers and acquisitions, and public and private offers) used by DMBs to raise capital during the 2005 and 2009 banking reforms, and the event of the global financial crisis which affected DMBs differently. More so, Charnes et al. (1985) suggested that the estimation of efficiency using the window approach provides robust results by repeatedly moving the window term.

Likewise, understanding the underlying factors that influence the efficiency, performance, and stability of banking sectors is essential for bank executives, central banks, bankers association, and other financial/regulatory authorities to help them forge policies that improve the banking sector (Sufian et al., 2016). Regression analysis is a main tool of econometrics, and it is widely used in banking studies to estimate or predict the factors that influence the behaviour of banking institutions. Regression analysis is concerned with the study of the dependence of one variable (dependent variable), on one or more other variables (explanatory variables), with a view of estimating and or/predicting the (population) mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter (Gujarati & Porter, 2009). The empirical literature has shown that there are several determinants of bank efficiency, performance, and stability. Capital levels, liquidity, asset management, operating efficiency, size of bank, overheads, leverage ratio, credit risk, non-performing loans, earnings, concentration, solvency risk, deposits, operating expenses, interest rate, exchange rate, GDP, and inflation have all been utilised in banking empirical studies with varying and contradicting results depending on the time period, business type of institutions, and jurisdiction. Given the divergent and conflicting effects of the chosen variables in the estimation of efficiency, performance, and financial stability, this study aligns with the CAMELS approach to select proxies that show how the 2005 and 2009 Nigerian reforms, and the episode of the global financial crisis influenced the Nigerian banking sector. To that end, panel data multiple regression estimation techniques (fixed effects and random effects) are used in this study to ascertain the extent to which capital adequacy, asset quality, management quality, earning capacity, liquidity and sensitivity to market risk, size and GDP determined the efficiency, performance, and stability of Nigerian deposit money banks.

Additionally, a qualitative dimension which is barely explored in banking literature is utilised in this study. Content analysis adopted in this study dwells mainly on the analyses of interview submissions from Nigerian bank regulators (CBN and NDIC) and bank executives

of DMBs to ascertain patterns and structures to derive meaning. This technique is utilised foremost to obtain first-hand information from the designers of Nigerian regulatory initiatives and bank executives which witnessed and participated in the 2005 and 2009 banking reforms. More so, this technique can shed light on the 'what, how and why' further regulatory initiatives like the bailout of eight DMBs and the bridge banking model had to be relied upon. In a nutshell, content analysis explores the dimensions which quantitative techniques that utilise financial statements and figures are unlikely to examine.

Finally, this study provides a robust assessment of Nigerian regulatory initiatives (2005 and 2009 banking reforms, the bailout of eight DMBs and the nationalisation of three DMBs into bridge banks) by using three different techniques (DEA window analysis, regression analysis, and content analysis). In line with the arguments presented above and the summary of the events that transpired in the Nigerian banking sector and the financial world in general, the rationale for embarking on this research is the next focus of this thesis.

1.2   Rationale for Research

Banks are the central financial intermediaries in the financial system of any country, and they carry out various vital roles through financial intermediation. The banking sector of any economy is the mechanism for sustainable economic growth and macroeconomic stability because it influences economic activities (Alper & Onis, 2011; Barth, James, Caprio, & Levine, 2006, 2007; Levine, 2005). This shows that banks matter for the welfare of the general populace, and as such, they should be monitored and adequately regulated. On this account, the Nigerian banking sector is regulated by the CBN and NDIC to ensure that deposit money banks (DMBs) continue to perform their important roles of intermediation, maturity transformation, maintaining financial discipline among borrowers, credit allocation, and facilitation of payments flows. Therefore, centred on the importance of the Nigerian banking sector to the Nigerian economy this study investigates the actions taken by Nigerian regulators towards ensuring safe and sound banking practices.

Several motivations for investigations on banking regulation and supervision exist. The global financial crisis of 2007 – 2009, highlighted that global regulation and supervision was far from adequate. With greater reason, more than 100 systemic banking crises have

devastated countries around the globe since the 1970s (Barth, Caprio, & Levine, 2013). All these banking crises at least reflect some defect in bank regulation and supervision. Several studies hold the view that the failure of a single bank has the potential of becoming systemic, therefore leading to a system-wide banking crisis (Acharya, 2009; Maghyereh & Awartani, 2014; Milne, 2014; Rajan & Ramcharan, 2016). For instance, the collapse of Lehman Brothers, one of America's biggest investment banks is believed to have triggered a chain reaction of economic, financial and psychological crisis (Global financial crisis) that engulfed the entire globe (Gupta, 2010). Therefore, investigations into the performance of banking institutions will assist in the mitigation of bank failures. To that end, the examination of the performance of Nigerian deposit money banks will provide directions and recommendations to policy makers and bank regulators.

More so, due to the episode of the global financial crisis, the international financial world recognised that repairing the financial system remains a major priority. Rescue measures in the form of individual country reforms and global measures like Basel III were introduced. However, Basel III has just been introduced, and its implication on financial stability has not yet been ascertained. For this reason, the limited scope of the application of Basel III encourages researchers to observe as countries implement the recommendations of the framework. Evidently, most developing countries and countries in Africa are not adequately represented on the Basel Committee apart from the BRIC countries and South Africa. Hence it is important that independent studies are carried out, in countries like Nigeria. Additionally, the 2009 banking reforms was also a reaction to the perceived adverse effect of the global financial crisis on the Nigerian banking sector, which makes a case for an investigation to ascertain the extent to which the reforms were able to spur banking performance and establish financial stability.

Furthermore, the study is of the view that the Nigerian banking system represents a unique case study, due to the two banking reforms it went through within a span of five years (i.e. 2005 – 2009). Additionally, various mergers and acquisitions were sanctioned by the reforms, and banks that were unable to attract additional capital after the recapitalization exercise of the 2005 banking reforms were absorbed through the purchase and assumption agreement or liquidated in line with CBN and NDIC guidelines. Equally, Nigerian regulators had to bailout eight deposit money banks in 2009 due to the build-up of non-performing loans. This move led to the sacking of eight bank chief executives and their boards. More so, three troubled banks were nationalised into bridge banks in 2011 by Nigerian regulators. This measure was

novel to the banking sector. Therefore, the effects of the 2005 and 2009 Nigerian banking reforms, and the various regulatory strategies adopted by Nigerian regulators are worth investigating. Consequently, the examination of the performance and efficiency of Nigerian deposit money banks will shed light on the impact of the two banking reforms and the strategies embarked by regulatory and supervisory authorities to resolve troubled banking institutions.

1.3 Contributions to knowledge

This research contributes to theory, practice and methodology. To the best of the knowledge of the researcher, there is no Nigerian study that employed the DEA window analysis technique to ascertain the performance and efficiency of Nigerian DMBs with particular reference to the banking reforms of 2005 and 2009. On this account, this study will contribute to the growing literature on bank efficiency and performance studies. More so, the DEA window analysis employed in this study can be used as an alternative approach by regulators.

Numerous studies have attempted to predict banking failures by using methodologies like logit models, probit models, discriminant analysis, neural networks, and hazard rate models (Cleary & Hebb, 2016). Few studies have however relied on the DEA and by extension the DEA window approach to predict financial distress. Pille & Paradi (2002) and Avkiran & Lin (2012) suggested that the DEA is an adequate technique for predicting financial distress, while Kwon & Lee (2015) and Premachandra, Chen, & Watson (2011) opined it lacked predictive capacity. On that account, this study contributes to argument and literature on the use of DEA and DEA window analysis as a methodology for predicting financial distress.

The factors that determine efficiency, performance and stability vary depending on the period, economic situation, or jurisdiction. To that end, this study contributes to the existing literature on the empirical determinants of bank efficiency, performance, and stability on several grounds. In contrast to most studies, this study relied on bank-specific CAMELS measures as variables, instead of depending on the discretion of the researcher in making variable choices. Moreover, this study does not only examine the effects of bank-specific CAMELS (internal factors). External factors such as GDP and inflation adjusted bank size are also examined.

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In furtherance of the investigation into the effects of Nigerian regulatory initiatives from the period of 2000 – 2013, this study contributes to literature and methodology by employing content analysis to evaluate interview responses from regulatory authorities and bank executives. Content analysis can be used as a stand-alone technique (Tangpong, 2011); however, it is used in tandem with DEA windows analysis and regression analysis to enhance the validity of this research finding. More so, the content analysis of is hardly used in banking studies. Therefore, its application in this study serves as a methodological recommendation for regulators and other bank stakeholders.

This study contributes to the growing literature on the recent global financial crisis. Academics and practitioners in various institutions and jurisdictions have sought to understand the deep issues that led to the crisis to devise means to prevent future similar occurrences. To that end, this study examines the effects of the global financial crisis on Nigerian DMBs to shed light on the Nigerian perspective.

Nigerian regulators relied on financial safety net strategies (bailouts and bridge banking model) to prevent the collapse of some DMBs. This study, therefore, contributes to the literature on financial safety nets as regulators struggle to design strategies that do not encourage moral hazard.

Finally, this study is of the view that the use of three different analysis techniques (DEA window analysis, regression analysis and content analysis) offers a robust approach to analysing complex, multifaceted, and dynamic phenomena such as banking regulation and supervision. Hence, this research shows how three different methods/techniques can be successfully applied to banking studies.

1.4   Research Aim

The purpose of this study is to assess the efficiency, performance, and stability of Nigerian deposit money banks (DMBs) with particular reference to the 2005 and 2009 banking reforms. The study focuses on the extent to which Nigerian banking reforms have enhanced or impeded the performance and efficiency of deposit money banks (DMBs). In broad terms, the study also aims to examine the strategies and initiatives adopted by Nigerian bank regulators in enhancing efficiency and promoting financial stability.

1.5   Research Objectives

Therefore, to achieve the aim of this research, the research objectives are as follows:

1. To examine the Nigerian banking sector prior and after the 2005 banking reforms and ascertain the extent to which the reforms impacted on the efficiency and performance of Nigerian deposit money banks.
2. To ascertain how statistical models can be used to predict bank distress in the Nigerian banking sector.
3. Investigate if the combination of statistical models will unearth, complement and provide deeper insight in the estimation of bank efficiency, performance and financial stability.
4. Determine the extent to which the global financial crisis impacted the performance of individual deposit money banks and the Nigerian banking sector in the whole.
5. Examine the role of financial safety nets in resolving distressed and troubled deposit money banks.
6. Explore whether changes in banking regulation and supervision (2009 banking reforms) in reaction to the global financial crisis enhanced efficiency, performance and stability of the Nigerian banking sector.

1.6   Research Questions

Hence, to achieve the aims and objectives of the study, the questions below are tested.

1. To what extent have the Nigerian banking reforms of 2005 and 2009 improved the efficiency, performance and stability of Nigerian deposit money banks?
2. How have financial safety nets been able to mitigate the occurrence of bank failures and financial crisis in Nigeria?
3. To what magnitude did the global financial crisis affect the efficiency, performance, and stability of Nigerian deposit money banks?
4. How have regulatory responses to the episode of the global financial crisis changed banking regulatory practices and internal control in the Nigerian banking sector?

5. How have the adopted statistical models been able to detect and predict troubled deposit money banks in the Nigerian banking sector?

6. What are the determinants of bank efficiency, performance, and stability in the Nigerian banking sector?

1.7   Thesis Structure

This thesis is composed of nine chapters including the current introduction chapter. Chapter two provides a background and history of banking regulation in the Nigerian banking sector. Chapter three is a review of theoretical concepts and empirical studies on banking regulation and supervision, bank performance, bank efficiency, and financial stability. Chapter four focuses on the discussion of the methodologies employed to provide answers to the research questions. Chapter five dwells on the DEA window analysis of Nigerian deposit money banks. Chapter six is a presentation of the regression results. Chapter seven is the content analysis of interview responses of bank regulators and senior bank managers. Chapter eight harmonises and discusses the findings of the DEA window analysis, regression analysis, and content analysis. Finally, chapter nine provides the conclusions and recommendations of the thesis.

The contents of each chapter are summarised as follows:

Chapter one has set the stage by highlighting the importance of banking institutions to economic development, while also stating why they should be regulated. It also briefly indicates that regulatory initiatives were unable to protect banking institutions from the global financial crisis that started in the second half of 2007. This chapter set out the rationale underlying the study and stated the contributions of the study to banking literature. It also delineated the relevance of the study and outlined the aims and objectives of the study from which the research questions were derived.

Chapter two examines the 2005 Nigerian banking reforms and the 2009 Nigerian banking reforms which were initiated to correct the shortcomings of the 2005 reforms and cushion the adverse effect of the global financial crisis on Nigerian DMBs. The chapter serves as a background to that study as it dwells on the specific elements of both the 2005 and 2009 Nigerian banking reforms.

Chapter three is a review of the literature and theoretical concepts related to banking regulation and supervision, financial safety nets, financial crises, and private monitoring. The techniques used to measure bank performance are discussed. Also, the related empirical literature on DEA and CAMELS are provided in this chapter. Additionally, the chapter rounds up with a review of Nigerian studies that focus on banking regulation and bank performance.

Chapter four focuses on the research methodology that presents the systematic framework that this research followed to achieve the aims and objectives of the study. The scope of the study and the justification for adopting the pragmatic philosophy in this research is presented, before the research approach that rationalises the adoption of both the deductive and inductive approach (abduction) is discussed. The advantages and disadvantages of the mixed methods research strategy are also presented, alongside the justification for its adoption. Additionally, the sources of data utilised and the three analysis techniques (content analysis, DEA window analysis, and regression analysis) employed are extensively examined in this chapter. Finally, the last section of this chapter outlines the validity and reliability of the study.

Chapter Five is the first of the three chapters dedicated to the analysis of the data obtained to examine the effects of Nigerian regulatory initiatives and the global financial crisis on the performance of Nigerian DMBs. The efficiency of individual Nigerian DMBs and the aggregate performance of the entire Nigerian banking sector is presented in this chapter. Using the DEA window technique and relying on a three-year window span and twelve windows in total, the efficiency of DMBs are traced through the periods the Nigerian banking sector went through the 2005 banking reforms, the global financial crisis, and the 2009 banking reforms. The chapter concludes with discussions on the efficiency of DMBs in the pre-2005 banking reforms periods, the 2005 and 2009 banking reforms periods, the effect of the global financial crisis on DMBs, and the efficiency of bailed-out DMBs and bride banks.

Chapter Six dwells on the multiple regression analysis of Nigerian DMBs using panel data from 2000 – 2013. The determinants of efficiency (BCC efficiency scores), bank performance (ROA) and stability (Z-Score) are assessed in this chapter. Hence, the evaluated determinants of bank efficiency, performance, and stability for the whole study period (2000 – 2013), the pre-2005 banking reforms period (2000 – 2004), 2005 banking reforms & GFC

period (2005 – 2008); 2009 banking reforms and post-GFC period (2009 – 2013) are presented in this chapter.

Chapter seven provides the content analysis of qualitative data, which was predominately obtained through the interview process. Responses from the staff of the two main regulatory agencies (CBN and NDIC) and senior bank managers from Nigerian DMBs are analysed in this chapter. The reactions obtained dwell on regulatory initiatives and the effects of the 2005 and 2009 banking reforms, and the global financial crisis on Nigerian DMBs. The challenges faced by DMBs and internal control practices put in place to mitigate against the adverse effect of risky practices and operations are also examined in this chapter. This chapter also briefly dwells on the private monitoring of Nigerian DMBs and the confidence of banking customers in the Nigerian banking sector. More so, the influences of international regulation on Nigerian regulatory initiatives are also explored in this chapter. The views of interview participants regarding the financial stability and prospects of the Nigerian banking sector are presented to round up the chapter.

Chapter eight harmonises and discusses the findings obtained from the three analysis techniques (content analysis, DEA window analysis, and regression analysis) employed in this study. The findings of this study are also reviewed and contrasted against related studies/literature with the intention of drawing valid and reliable conclusions in this chapter. Hence, the results of this study are reassessed alongside related findings in this chapter.

Chapter nine provides a summary of the key findings and conclusions from drawn from the qualitative and quantitative analysis techniques employed in this study. Recommendations to improve banking regulation and supervision are also outlined within this chapter. More so, the contributions of this study to literature and practice are presented. Finally, the chapter concludes by delineating the limitations and constraints of the study and proposing suggestions for future research.

Chapter Two: Banking Reforms in Nigeria

2.1   Introduction

Reforms are a constant feature in most banking systems. Banking reforms are usually initiated in response to challenges presented by factors and developments ranging from systemic crises, deregulation, technological innovations, globalisation, and proactive measures to strengthen the banking system (Lessambo, 2013).

The Nigerian banking sector went through two major reforms (2005 banking reforms and 2009 banking reforms) within the period under review. More so, Nigerian regulators engaged in the bailout of eight DMBs in 2009, while they nationalised three DMBs into bridge banks in 2011 to prevent their collapse. The Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC) are the two main authorities saddled with the responsibility of regulating and supervising Nigerian DMBs. This chapter, therefore, dwells on the elaborate presentation of the rationale and objectives of the 2005 and 2009 Nigerian banking reforms. The Nigerian banking sector went through several reforms since the establishment of the Bank for British West Africa in 1894. This study focuses only on the two most recent reforms in the Nigerian banking sector, hence only the 2005 and 2009 reforms are discussed in this chapter.

2.2   Rationale for the 2005 Banking Reforms

A sound banking system provides a platform for carrying out economic transactions and monetary policy, and aid in the efficient channelling of savings into investment, which supports economic growth (IMF, 2014). More so, the IMF suggested that unsound banking systems do not only interrupt financial intermediation, but also: erode the efficacy of monetary policies; intensify economic downturns; give rise to capital flight; engineer exchange rate pressures; and result in fiscal costs related to resolving troubled banking institutions. Hence, due to the negativities enshrined in unsound banking systems, regulatory

authorities should ensure policies and guidelines available to banking institutions are always in tuned with best global practices.

Before the 2005 banking reforms, the Nigerian banking sector was diagnosed to consist of structural and operational inadequacies. The inadequacies as presented by the CBN include low capital base; large numbers of small banks with rather few branches; poor rating of some of the banks; weak corporate governance; declining ethics; inaccurate reporting/disclosure; non-compliance with regulatory requirements; huge non-performing credits; and over-dependence on public sector deposits. The inclination to correct these inadequacies provided the motivation for the 2005 banking reforms (CBN, 2004, 2005).

2.3   Nature of the 2005 Banking Reforms

The objectives of the banking sector reforms include the following:

- Banks should have a minimum capital base of N25 billion on or before year end 31 December 2005;
- Consolidation of banks by the use of mergers and acquisitions;
- The adoption of risk-focused and rule-based regulatory framework;
- Adoption of zero-tolerance in the regulation of banking institution, particularly about data/information rendition, reporting and disclosure;
- Automation of the procedure for making returns by banks and other financial institutions through the electronic financial analysis and surveillance system (e-FASS);
- Implementation of the contingency planning framework for systemic banking distress (CBN, 2004, 2005).

In furtherance of the reform programme, the actions taken by Nigerian regulatory authorities to achieve the objectives of the reforms include(CBN, 2004, 2005):

- The provision of guidelines and incentives to banks to encourage implementation;
- The establishment of the Technical Advisory Committee on Banking Sector Consolidation;
- The establishment of a help desk at the Central Bank of Nigeria;

- The formation of a Banking Consolidation Implementation Committee;
- The promotion of collaborations between the CBN and NDIC with other institutions like the Federal Inland Revenue Service, Securities and Exchange Commission, and the Corporate Affairs Commission;
- The issuance of circulars and procedure manuals on consolidation timeframe and returns;
- Debt forbearance for a few banks to make them attractive to potential investors for mergers/acquisitions;
- The verification of capital to ensure that borrowed or illicit funds from the banking sector were not utilised to finance the purchase of bank shares;
- Technical assistance from the IMF;
- Periodic interactive meetings with banks to determine the level of progress made;
- The procedure for the establishment of an Asset Management Corporation that would purchase the non-performing loans plaguing the banking system was put in motion.

Furthermore, regulators and banks encountered various challenges during the consolidation exercise (CBN, 2005; NDIC, 2005). As revealed by the CBN and NDIC, the challenges encountered include the following:

- The lack of experience and technical knowledge by regulators and banks in the management of such a sensitive initiative which involved high-level consolidations and mergers/acquisitions;
- The presence of delinquent assets and large amounts of non-performing loans that were capable of distorting the balance sheet of the emergent banks;
- The high cost of consolidation;
- The likelihood of inflow of laundered forms into the system and the inability to regulators to verify the sources of funds used in the recapitalisation of banks;
- A high percentage of government ownership in some banks and its implication for corporate governance in emerging banks.

2.4   Outcome of the 2005 Banking Reforms

At the conclusion of the consolidation exercise, twenty-five banks emerged through mergers and acquisition. While fourteen banks that neither met the N25 billion minimum capital

requirement nor found suitable merger partners had their licences revoked. And as mandated, the NDIC was directed to obtain court orders to embark on the liquidation of the affected banks (CBN, 2006; NDIC, 2006).

In a bid to comply with the minimum capital requirement mandated by the reform, the banks that emerged raised N404.4 billion from the Nigerian capital market through private placements and public offers. Of the total amount raised, the CBN verified and accepted N360 billion as at the end of the consolidation exercise (Kama, 2006). More so, the banking sector also enjoyed an inflow of foreign direct investment (FDI) of $652 billion and £162,000 (Kama, 2006; Okonjo-Iweala & Osafo-Kwaako, 2007).

Other benefits of the 2005 banking reforms include(CBN, 2006; NDIC, 2006):

- The astronomical increase in the combined capitalization of the emergent banks from N327 before the consolidation exercise, to N755 billion post-consolidation.
- The reforms gave rise to fewer but bigger banks (large capital base).
- The reforms led to the reduction of family owned and controlled banks. It resulted in the dilution of ownership and broadened the spread of shareholders.
- The consolidation exercise led to the listing of virtually all the banks on the Nigerian stock exchange, owing to the reliance on the capital market to raise funds. This move ushered in wider regulatory oversight, as the Nigerian Stock Exchange (NSE) and the Securities and Exchange Commission (SEC) joined the regulatory team.
- Additionally, with fewer banks in the banking industry, regulation and supervision became more streamlined, focused and less cumbersome.

Finally, the decision to embark on the consolidation exercise was a genius move that saved the Nigerian banking sector. The banks that emerged were adequately capitalised, bigger and financially stable. The increase in capitalization meant that the banks were positioned to finance other sectors of the economy. However, the excess liquidity in the hands of bank executives was not utilised as envisaged.

Mismanagement became the order of the day, and the industry was again plunged into trouble, which led to the 2009 banking reforms. The section below presents the problems that persisted in the Nigerian banking industry post-consolidation, which forms the rationale for the 2009 banking reforms.

2.5   Rationale for the 2009 Banking Reforms

The right question to ask at this junction is "what went wrong after the success of the banking consolidation exercise that culminated in December 2005?" In answering the above question, (Sanusi, 2010) suggested that the Nigerian banking industry experienced tremendous growth post-consolidation. On the contrary, stakeholders in the banking industry (banks and regulators) were not adequately equipped to monitor and sustain the explosive growth witnessed in the sector. He further opined that in addition to the global financial crisis, the following eight (8) interdependent factors paved the way for an extremely fragile financial system:

- Macro-economic disequilibrium created by large and sudden capital inflows - The Nigerian economy depends largely on the oil sector for revenue. Equally, global oil prices steadily increased between 2004 and 2008, and the lack of sophistication of revenue streams in the Nigerian economy led to volatility. As most banks benefited from inflows from the oil sector, a fall in oil prices during the global financial crisis affected both government and bank revenues. Coupled with the excess liquidity in the banking system post-consolidation and increase in global oil prices, Nigerian DMBs started lending to non-priority sectors of the economy and the capital market. The repercussion of such lending and dependence on the oil sector became the bane of the Nigerian economy during the global financial crisis and periods leading to the 2009 banking reforms.

- Inadequate corporate governance structures in banks - Sanusi also revealed that the huge heave of capital available to banks happened at a time when the corporate governance standards in banks were extremely inadequate and weak. Corporate governance weakness that existed pre-consolidation were not addressed during the consolidation reforms and these metamorphosed to widespread governance malpractices by bank executives. Board members neglected their functions of providing guidance and monitoring the activities of bank executives. While bank executives also misled board members. Additionally, bank examinations found out that some board members and bank executives were not qualified enough to run the activities of banks. Thus, board executives were either ineffective or dormant.

- Lack of consumer and investor sophistication - A lack of consumer and investor sophistication also contributed to the crisis that enveloped the Nigerian banking

system. Investors and bank customers did not engage in any form of monitoring, further contributing to the lack of supervision in the post-consolidation era.

- Inadequate financial information disclosure and transparency- The CBN found out that financial reports made available by banks were most at times inaccurate and incomplete. Therefore, misleading regulators in their supervisions, while also feeding investors with wrong information on which to make investments decisions. More so, banks did not make timely disclosures and disclosed information was doctored.

- Severe gaps in regulatory frameworks - There was little or no corporation among various regulators in the banking industry. Consolidated coordination was lacking. The FSRCC, the coordinating body of regulators in the Nigerian financial industry, also did not meet for two years (2006-2008). Additionally, the Security and Exchange Commission did not make available to the CBN the examination reports of bank subsidiaries, and there was no framework for consolidated bank examinations.

- Uneven supervision and enforcement - Inadequate enforcement of regulations and uneven supervision played a pivotal role in aggravating the crisis that befell the banking industry. Regulators were ineffective in their role as supervisors, and they failed to foresee irregularities in the operations of banking institutions. Additionally, supervision did not detect or proffer solutions to the gross corporate governance failures that existed in the banking system. Regulators did not embark on critical examination processes like the coordinated pre-examination planning and training of supervisors. The view that the banking sector was healthy because of the success of the consolidation exercise encouraged a culture of tolerance and acceptance of status quo without questioning inefficiencies in the behaviour of banks. These lapses compromised the importance of supervision in financial systems.

- Disorderly governance and management processes at the Central Bank of Nigeria - As the regulation of banking institutions is not the only crucial duty of the CBN. The approach to supervision, in general, was laissez-faire. Issues relating to the stability of the financial sector and banking regulation was not made a priority at CBN board meetings. Sanusi further opined that the CBN was not properly organised and equipped to analyse macroeconomic issues and systematic risks inherent in the banking system. As a result, regulators were unable to handle the impact of cross-border capital flow, oil price volatility, weak corporate governance, and asset price bubbles in the capital market.

- Weaknesses in the business environment - In the same line, underdeveloped business structures hurt the banking industry. The absence of reliable local credit rating agencies, credit bureaux, unified national database, and an unattractive legal system paved the way for unethical and non-standard banking practices.

The above issues as presented by Sanusi (2010) showed that the Nigerian banking industry required attention, hence the banking reforms that followed.

2.6 Nature and Objectives of the 2009 Banking Reforms

As a follow-up to correct the issues plaguing the Nigerian banking system, the CBN presented a blueprint for revamping the sector (CBN, 2009; Sanusi, 2011, 2012). According to Sanusi, the CBN Governor as at the time of this reform, the blueprint is centred on four pillars:

Pillar One: Enhancing the quality of banks

Pillar Two: Establishing financial stability

Pillar Three: Enabling healthy financial sector evolution

Pillar Four: Ensuring the financial sector contributes to the real economy

Pillar One: Enhancing the Quality of Banks

This pillar is made up of five parts aimed at enhancing the operations and quality of banking institutions. These include implementation of risk-based supervision; reforms to regulations and regulatory guidelines/practices; enhanced consumer protection; and internal transformation of the Central Bank of Nigeria. The five parts of this pillar are aimed at fixing issues in the banking industry such as supervision and enforcement, data quality, risk management, governance and financial crime. In line with the provisions of this pillar, regulatory authorities (CBN and NDIC) are to ensure that they embark on risk-based supervision (RBS) to make sure that governance best practices are entrenched in the banking system. Additionally, high-level communication processes between banking institutions and regulators will encourage data quality and the implementation of regulations. A systematic

review of regulations and guidelines surrounding the issues that affected the banking industry will also enhance the quality of banks(Sanusi, 2011, 2012).

Furthermore, this pillar is also aimed at making sure that consumers in the banking industry are adequately protected. Standards for customer service will be set to ensure that bank customers are always treated fairly and justly. The activities of the Consumer Protection Unit, a unit in the Financial Policy and Regulation Department of the CBN were enhanced to ensure that banks apply the appropriate rules and regulations(CBN, 2009).

The CBN will be transformed under this reform to position it in good stead to ensure best corporate governance practices, people development, stronger information management systems and enhanced disclosure practices(Sanusi, 2010).

Pillar Two: Establishing Financial Stability

The main trust of this pillar centres on the CBN providing leadership through bolstering the Financial Stability Committee; establishment of micro-prudential rules; counter-cyclical fiscal policies by the government via development of directional economic policies; and the development of the capital market as an alternative to bank funding. The CBN sought to achieve the aim of this reform by designing a macro-prudential framework geared towards ensuring that monetary policies are not only shaped by systemic risk trends but are in line with expanded goals for product and asset quality. More so, the CBN planned to drive the development of the capital market by improving its depth and accessibility to provide an alternative to bank funding. Additionally, the CBN will seek to stimulate the implementation of directional economic policy and in particular counter-cyclical fiscal policies that will help stir the economy from dependence on oil and its inherent volatility (Sanusi, 2010, 2011, 2012).

Pillar Three: Enabling Healthy Financial Sector Evolution

The emphasis here is on stirring the banking industry into becoming globally competitive. This is to be achieved by the provision of the necessary financial system infrastructure like credit bureau and registrars; improvements in the cost structure of banking institution via business process outsourcing and cost control; reduction of the informal sector synonymous to emerging economies; and greater financial inclusion. Likewise, this reform will seek to encourage the participation of foreign banks in the banking industry as long as their

participation does not impede the development of the local banking system(Sanusi, 2010, 2011).

In a bid to ensure the aim of this pillar is achieved, regulatory authorities encouraged market-based merger and acquisitions activities to create bigger and stronger banks. Central to this reform, the universal banking model, which was introduced in 2004, was abolished. And in a bid to deviate from the basic one-size-fits-all banking model, a four-tier banking licence was introduced. The guidelines for the new banking model places the minimum capital requirements for (Oxford Business Group., 2013):

- National commercial banks -N25bn ($157.50m)
- International banks - N100bn ($630m)
- Merchant banks - N15bn ($94.5m)
- Specialised and Development Regional banks - N10bn ($63.5m)
- Nationwide Microfinance banks - N5bn ($31.5m)
- National Non-Interest (Sharia-Compliant) banks - N10bn ($63m)
- Regional Non-Interest (Sharia-Compliant) banks - N5bn ($31.5m)

Finally, three private credit bureaux were licenced, and the CBN in collaboration with the Securities and Exchange Commission (SEC) started working towards creating an acceptable number of registrars for securities in the country to boost financial system infrastructure(CBN, 2009).

Pillar Four: Ensuring the Financial Sector Contributes to the Real Economy

This final pillar is geared towards ensuring that the Nigerian financial sector advances the development of the real economy. In this line, the CBN will embark on the following:

- The continuous evaluation of existing development finance institutions and initiatives in import-export credits, manufacturing and agriculture;
- Initiatives that will lead to the examination of issues that are critical for economic development and infrastructural development, for instance, power, port and railway;
- Promote studies on potentials of public-private partnerships and venture capital initiatives; and

- Collaborations with state governments in the administration of pilot programmes that are directed towards the financial sector's contribution to socio-economic development (CBN, 2009; Sanusi, 2011, 2012).

In summary, the above submit that the 2009 reforms and the four pillars, in particular, are positioned to improve the general efficiency and profitability of Nigerian DMBs, and the stability of the Nigerian banking system. On account of that, this study dwells on ascertaining the extent to which the objectives of the reforms have been achieved.

Furthermore, Sanusi (2012) has suggested that the 2009 reforms have yielded some results. The positive impact of the reforms includes:

- Nigerian DMBs have adopted best practices in the areas of corporate governance and risk management because of the reforms. On that account, transparency and public disclosure of transactions/operations have significantly improved.
- Some DMBs have become profitable and improved their balance sheet positions, as shown by the recent results of financial statements.
- DMBs have resumed lending to the private sector with additional liquidity of more than N1.7trn injected into the banking sector through the issuance of AMCON bonds, and noteworthy progress in redirecting credit to SMEs and the power sector at single digit interest rates.
- The CBN has issued a new and revised code of corporate governance. DMB CEOs can only serve a maximum tenure of ten years. To that end, CEOs who would have served for ten years on July 31, 2010, ceased to function in that capacity.
- Nigerian DMBs are now major players in the global financial market with many falling within the Top 20 banks in Africa and among Top 1000 banking institutions in the world.
- Increased widespread use of e-payment and technology driven payment services has been recorded.
- Prior volatility in the exchange rates witnessed in the foreign exchange market has been brought under control. On that account, the premium is within the international standard of 5%.
- Cooperation between regulatory authorities and DMBs has increased through regular meetings and collaboration on policy issues.

- The reforms have translated into greater confidence in the banking system with the elimination of distress DMBs and the adoption of a strict code of corporate governance.

However, despite the efforts of regulators, the new four pillars of the 2009 reforms, and the impact of the reforms on the banking sector and the Nigerian economy, three DMBs were nationalised into bridge banks in 2011. Two years after the commencement of the 2009 banking reforms, the CBN and NDIC mandated DMBs with eroded capital levels to recapitalise in line with the provisions of the reforms by the end of September 2011. However, three DMBs (Afribank Plc, Bank PHB, and Spring Bank) were unable to meet this deadline. On that account, the NDIC in line with the provisions of the NDIC Act, after due consultations with the CBN and the Federal Ministry of Finance resolved the three DMBs through the 'Bridge Bank Mechanism'. The NDIC suggested that they resorted to adopt the bridge banking mechanism in the interest of depositors and to avoid liquidation which could have dire consequences for depositors and undermine public confidence in the banking sector (NDIC, 2011). The above therefore suggests that the 2009 reforms might not have adequately erased the problems and issues in the Nigerian banking sector. To that end, this study probes to understand what transpired during the period under review.

2.8   Chapter Conclusion

This chapter concentrated largely on the two reforms (2005 and 2009 Nigerian banking reforms) which the Nigerian banking sector went through within the period under review. Additionally, other regulatory initiatives like the bailout of eight DMBs in 2009 and the nationalisation of three DMBs into bridge banks in 2011 are also mentioned.

Given the rationale of both reforms, there is no doubt that the Nigerian banking sector needed to go through the reforms. The 2005 reforms changed the landscape of the Nigerian banking sector and set the pace for growth and further reforms. Moreover, even though the 2009 reforms was embarked upon to correct the ills plaguing the banking sector, it is likely that the episode of the global financial crisis might have led to the collapse of many DMBs if the 2005 reforms were not carried out.

More so, the 2009 banking reforms suggest that banking institutions should be regularly monitored to ensure they do not engage in activities that derail the good intentions of regulatory initiatives (like the 2005 banking reforms). Also, the decision to embark on the 2009 banking reforms and the episode global financial crisis show that regulation and supervision of banking institutions should transcend beyond capital regulation and recapitalisation. Having adequate capital translates to having the liquidity to operate and invest. However, if sound management, risk management, and supervisory practices are not put in place, the probability of mismanagement in periods of abundance (recapitalisation) will be high. Therefore, various factors apart from capital have the potential of determining efficiency, performance, and stability. It is based on this assertion that this study explores and unearths all that transpired in the Nigerian banking sector within the period of 2000 – 2013 with particular focus on the 2005 and 2009 banking reforms, the global financial crisis, the bailout of eight Nigerian DMBs in 2009, and the adoption of the bridge banking mechanism. Finally, in addition to serving as a background to this study, this chapter elaborates on the rationale for the research.

Chapter Three: Theoretical Foundations and Literature Review

3.1   Introduction

The first chapter of this study introduced the focus of this study, and presented the rationale for this research, alongside the aims and objectives of the study, and the research questions this study seeks to answer. While the second chapter focused primarily on the Nigerian banking sector and it traced the history of banking and banking regulation in Nigeria. The elements of the 2005 and 2009 Nigerian banking reforms initiated by the CBN and NDIC were presented in the previous chapter as a background to this study. On that account, this chapter reviews related literature on banking regulation and supervision, the rationale for regulating banking institutions, international and national regulatory initiatives, financial safety nets, techniques for measuring bank performance, and exploratory and empirical bank performance-related studies. Additionally, the three most utilised measures for analysing the performance of banking institutions are also covered in this chapter. Therefore, the chapter starts by briefly defining banking regulation and supervision before trying to rationalise why banking institutions should be regulated and supervised.

3.2   Banking Regulation and Supervision

Financial systems world over have experienced various forms of banking crisis alongside extensive changes in the structure and nature of banking in recent times. Events ranging from the deregulation of financial systems, innovations and technological advancements, cross-border banking and lately the most damaging financial crisis since the Great Depression, the Global Financial Crisis (2007-2009) have all made it necessary for local and international policy makers to divert considerable attention to the essential function of banking regulation and supervision (Barth, Caprio & Levine, 2013). Regulation therefore in the context of banking can be viewed as laws and rules applicable to banking, while supervision refers the enforcement of banking regulation and the monitoring of banks' activities by regulatory agencies (Crockett, 2001).

Regulations have a strong hold on the operation and developments of financial markets, and they are often adjusted and revised to be able to cope with changes in market structure, new financial instruments and innovations, financial markets developments and sporadic financial crisis. Although countries through the functions of regulation and supervision, want financial systems that (1) encourage innovation and efficiency, (2) provide transparency, (3) ensure safety and soundness, and (4) promote competition in global markets, policy trade-offs become unavoidable. Acharya et al. (2011) opined that financial intermediation and innovation might become less efficient for the reason that the policies that were initially put in place to ensure greater financial robustness. For instance, measures designed to promote financial growth and innovation may grind down safety, soundness and transparency.

Even though countries world over all seek to maintain confidence and stability in their financial systems, regulatory arrangements differ. It is based on the different views adopted by different societies that this research will look at the contrasting approaches (official regulation and private monitoring) to banking regulation and supervision, the rationale for regulating banking institutions, and the different types of banking regulation.

3.3   The Rationale for Regulation and Supervision

The pivotal role played in today's modern economies by financial institutions cannot by overlooked. Banks as major players in the financial system are the most regulated institutions because they are saddled with the responsibilities of running the payment systems of countries and the management of investors' money, in addition to allocating financial capital to different sectors of the economy, and the implementation of monetary policies (Pilbeam, 2010). More so, the explosive nature of financial markets, the specificity of banks, increased competition and diversification further exposes banks to risk and challenges. Traditionally, governments intervene to regulate and supervise the operations and activities of banks because of the financial intermediation roles they play and their economic importance, but in recent times government intervention has been rationalised on the grounds of "market failure (for instance the Global Financial Crisis)." Consequently, Pilbeam (2010) opined that a market devoid of some form of regulation would produce a suboptimal outcome.

According to Heffernan (2005) and Pilbeam (2010), financial institutions are subjected to regulation and supervision for a variety of reasons:

- Investor/Consumer Protection: Financial products offered to investors do not explicitly show the risks associated. Insiders in the form of directors and managers are privy to certain information, which they can use to their advantage, and to the detriment of outsiders (investors and consumers).

  Hence, the onus is on the government to ensure that financial institutions make available adequate information. For this reason, various countries have adopted regulations designed to prohibit insider trading, and regulators have imposed financial information disclosure requirements.

- Externalities: Because banks are significant for resource allocation and economic growth: the failure or collapse of a banking institution may impinge on the stability of the entire financial system. Governments, therefore, intervene through systemic supervision to ensure financial stability and mitigate against systemic failure.

- Illegal Activities: Effective regulation and supervision can subdue the criminal activity of agents (directors, managers, and staff) in the forms fraud, tax evasion and money laundering.

- Market Power: Financial institutions may exert too much power especially in markets where competition is absent. For instance, the pricing of financial products and services may be grossly unfair because of monopolistic power held by a few large institutions. Policies aimed at protecting consumers against monopolistic exploitation are therefore introduced to encourage competition and price-setting.

Although, the rationale for banking regulation and supervision have been well documented. Economic views can only justify bank regulation and supervision on the uncertainties that exist in financial systems and financial instabilities (Llewellyn, 1999). Lindgren, Gillian, & Matthew (1996) opined that in recent years, bank failures have become more common, systemic in nature, and expensive: therefore questioning the justification of regulation and supervision. Proponents of regulation argue that the increasing vulnerabilities experienced in financial markets and especially banking institutions make a case for increased effective regulation and supervision. While, the societal viewpoint argues that regulation and supervision further imposes costs on the taxpayer, in addition to the moral hazard problems it creates (Barth et al., 2006). More so, Benston & Kaufman (1996) suggested that arguments

mostly used to buttress the need for the regulation of banks are not supported both theory and empirical evidence. While also stating that banks should only be prudentially regulated to scale down the negative externalities resulting from the deposit insurance schemes imposed by governments.

Conversely, Drage, Mann, & Michael (1998) opined that effective regulation and supervision is necessary for the development of banking systems and so blamed the Asian banking crisis on poor regulation. In agreement, Llewellyn (1999) suggested that weak management, bad incentive structures and control systems within banks, alongside poor regulation, monitoring and supervision are elements that emerge in banking crises. Also, Jalilian, Kirkpatrick, & Parker (2007) argued that when regulation is imposed in a bid to limit banking activities, the efficiency and the conduct of banking business will be gravely affected. This in turn could result in banks investing in risky activities that evade regulation (regulatory arbitrage), therefore, negatively affecting financial stability and economic growth for which it is intended.

The submissions agree that regulation and supervision of banking institutions is important, however weak regulation has been blamed for the inability to manage banking risk and protect banks from failing. This position is reinforced in recent banking literature as various academics and market players have suggested that the recent global financial crisis occurred due to the failure of regulation and supervisors (Ayadi, Naceur, Casu, & Quinn, 2016, Cihak, Demirguc-Kunt, Martinez, Soledad, 2013; Merrouche & Nier, 2014).

In spite of the criticisms ascribed to weak international and national regulation and supervision due to the event of the global financial crisis, effective financial regulation and supervision are considered integral to financial stability as a well-functioning regulatory, supervisory framework has the potential of minimising moral hazard and discouraging excessive risk-taking (Ayadi, 2016). It is a result of the above that this study examines the regulatory and supervisory initiatives of Nigerian regulators and to what extent they have instituted a well-functioning regulatory and supervisory framework in the Nigerian banking sector.

As highlighted in the first two chapters of this thesis, the Nigerian banking reforms of 2005 and 2009 aimed at improving the general efficiency, performance (profitability) and stability of Nigerian DMBs. On that account, the reforms paid particular attention to recapitalisation with the view that the efficiency, performance and stability of DMBs will be guaranteed

when they have adequate capital. Therefore, it can be suggested that Nigerian banking reforms were more of capital regulations.

3.4   Capital Regulation

Capital regulation became the focus of banking regulation since consultations for the first Basel accord began in 1988. The focal opinion was that more capital should make banking institutions better able to absorb losses with their resources, without becoming insolvent or requiring bailouts with public funds. On that account, regulatory consensus comes to view capital as a tool for curbing risk-taking created by limited liability and intensified by deposit insurance and bailout expectations. Given recent happenings, the global financial unquestionably indicated that existing capital regulation, in its design or implementation, was inadequate in the prevention of panic in financial systems, which necessitated emergency government intervention around the globe to prevent the collapse of banking institutions. Moreover, a large proportion of the rescued institutions appeared to be in compliance with minimum capital requirements shortly before and during the financial crisis (Demirguc-Kunt, Detragiache, & Merrouche, 2013).

In like manner, Deli & Hasan (2016) opined that capital regulation is the flagship of financial regulation because it is considered a means to mitigate the risk of bank failures and related systemic adverse macroeconomic developments. However, the theoretical debate on the effects of capital regulation (almost exclusively referring to capital requirements) and general bank performance (profitability, efficiency, and stability) highlight both negative and positive effects.

Put differently literature offers two scenarios through which capital requirements may influence systemic risk. On the one hand, capital requirement may likely reduce the individual risk-taking behaviour of banking institutions and consequently aid to reduce systemic risk, for the reason that individual risk is a significant driver of systemic risk. On the other hand, banking institutions response to capital requirements may promote linkage within the banking system, and as a result, increase systemic risk. Thus, decreasing individual risk may not always concurrently reduce overall systemic risk (Zhou, 2013). To that end, this

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section reviews such literature as precedence for ascertaining the recapitalisation exercises of the 2005 and 2009 Nigerian banking reforms.

Given the view expressed above, Demirguc-Kunt et al. (2013) investigated the effectiveness of current regulatory capital regulations and tested theories that support the use of capital regulation to curtail bank risk-taking incentives and absorbing losses. They found support for the assertion that stronger capital levels are important components during systemic crises. Therefore, suggesting that the current focus on strengthening capital requirements is appropriate. Additionally, they found that greater emphasis on 'higher quality capital' in the form of tangible assets or Tier I capital is justified.

Similarly, Fanti (2014) investigated the effects of capital accords introduced by the BIS (Basel I, Basel II, and Basel III). The main result obtained suggested that the introduction of sufficiently high capital requirements is effective for the objective of maintaining or restoring banking sector stability with heterogeneous and homogeneous banks' expectations.

Likewise, Berger & Bouwman (2013) examined the relationship between bank capital and different facets of bank performance in normal times, and banking and market crisis periods for US banks. Their study indicated that bank capital increases the probability of survival and market share of small banking institutions at all times (normal times, banking crisis, and market crisis). Additionally, they found that high capital levels help medium and large banking institutions primarily during banking crises, and particularly during the one with relatively limited government intervention, and the credit crunch of the early 1990s. In sum, they are of the opinion that capital acts as an absorber of losses.

Deli & Hasan (2016) examined the effects of bank capital regulation on loan growth by using bank-level data from 125 countries within the period of 1998 to 2011. The results indicated that capital regulation only has a weak negative effect on loan growth. Moreover, the effect is entirely offset when banks hold moderately high levels of capital. However, they found that the components of capital requirements that have the most significant negative effect on loan growth are those associated with the prevention of banks to utilise as capital borrowed funds and assets other than cash or government securities.

Lutz (2016) examined the effects of new capital requirements for systematically important financial institutions (SIFI) proposed by the U.S Federal Reserve. The results obtained indicated that the announcement to recapitalise SIFI led to lower abnormal initial stock

returns for the SIFI that then reverse and dissipate after three days. Interestingly, the findings suggest that the increased capital requirements proposal for large SIFIs had no impact on economic and financial market interest rates.

Guidara, Lai, Soumare, and Tchana (2013) investigated the cyclical behaviour of Canadian banks' capital buffers and evaluated its effect on banks' risk and performance throughout business cycles and about Canadian regulatory changes during the different Basel regimes. They found that Canadian banks were well capitalised, which explains how they weathered the recent global financial crisis. More so, they found that bank capital buffers demonstrate positive co-movements with business cycles. Conversely, their results did not show any strong evidence that variations of banks' capital buffer affect the exposure of banks to risk and return on equity. Thus, the drive to hold excess capital buffer may be motivated by market discipline.

Dagher, Dell'Ariccia, Laeven, Ratnovski, and Tong (2016) examined how various levels of bank capital would have performed in past banking crises. They found that high capitalisation can absorb losses during banking crises, but decline fast once capitalisation attains 15 – 23 percent of risk-weighted assets. They suggested that protection against extreme crises requires significantly more loss absorption capacity; however, such crises are rare. Moreover, results are slightly different for emerging and low-income countries. Although banking crises in these countries have been historically associated with greater bank losses, banking systems are usually smaller than those in developed economies are. To that end, losses more than capital will likely represent only a small fraction of GDP and may as well have limited macroeconomic effects.

The literature on capital regulation above shows that high capital levels were able to absorb losses in some jurisdictions, but failed to do the same in other jurisdictions. More so, losses in banking institutions in developed countries had more impact on the macro economy than in less developed countries. Additional, though the Basel Accords motivated banking institutions to acquire and retain more capital, the Accords were unable to absorb losses during the episode of the global financial crisis. Hence, the endorsement of the Basel III Accord by the BIS on December 20, 2010. The new Basel III was unveiled to address the market failures showcased by the global financial crisis, and the failure of the previous accords to prevent the crisis. Therefore, the limited scope of the application of Basel III encourages researchers to continue to observe as countries implement the recommendations.

Conclusively, the submissions above indicate that bank performance and stability transcends recapitalization and capital regulation. However, the 2005 and 2009 Nigerian-banking reforms positioned recapitalisation as the main component. To that end, this study examines how successful these reforms have been in promoting bank performance and financial stability. Additionally, given that other factors like asset quality, management quality, liquidity, and size were in one way or another affected by the Nigerian reforms, other sections of this chapter reviews literature that examined these factors in relation to the efficiency, performance, and stability of banking systems.

3.5   Banking Consolidation

The consolidation of Nigerian DMBs through mergers and acquisition was a major element of the 2005 banking reforms. As already highlighted in the preceding chapter, Nigerian DMBs either merged or were acquired in a bid to meet the N25bn capital requirement. On the premise that the consolidation of Nigerian DMBs was targeted at meeting the minimum capital requirement, literature on banking consolidation is not extensively considered. More so, consolidation involves mergers and acquisitions, which are not the primary focus of this study. However, due to the importance of the consolidation exercise of the 2005 banking reforms, this section dwells on the concise review of banking consolidation literature.

The consolidation of the financial sector has continued to be an internationally significant issue due to financial events in the last two decades. Consolidation modifies the structure of the banking sector through mergers and acquisitions (Montes, 2014). More so, consolidation has been considered because of the global trend of technological development, deregulation and globalisation. In reaction to these developments and events, the performance of banks relying on traditional systems has decreased considerably, leading to an increase in mergers and acquisitions (Shin & Kim, 2013). Evidence from the literature suggests that bank consolidation due to changes in the financial markets occurs in developed economies, while governments have been the driving forces of consolidation in emerging economies (Gelos & Roldes, 2002). True to this assertion, the government through the regulatory authorities engineered the consolidation of Nigerian DMBs in 2005. Given the brief introduction of bank consolidation and the rationale for considering it in this study, a few related studies are presented below.

To shed light on the logic for the trend of consolidation in the banking industry, Tadesse (2006) investigated the Japanese banking sector before the onset of the banking crisis and structural reforms of the 1990s. The evidence obtained showed diseconomies of scale to be pervasive in large banks, thus defying the rationale for consolidation. However, the study provided evidence of underlying technological progress that operates to increase the banking industry's efficient minimum size and generating economies at larger banks that justify the option of consolidation.

Chu (2015) investigated the Canadian experience of banking consolidation over the period of $1867 - 1935$. The evidence showed that out of the 27 banking failures examined, only one was an acquiring bank, while all the other acquiring banks grew substantially in both size and market share.

Mishkin (1999) argued that even though financial consolidation leads to the creation of large institutions that might expose the U.S financial system to increased systemic risk. The downside of financial consolidation can be handled by vigilant supervision and government safety net guarantees. However, Mishkin suggested that financial consolidation has been beneficial because it presents the opportunities to radically reduce the scope of deposit insurance and limit it to narrow bank accounts, while also limiting moral hazard created by government safety nets.

Olivero, Li, & Jeon (2011) examined the relationship between increased consolidation in banking and monetary policy transmission in eighteen Asian and Latin American countries from the period of 1996 to 2006. Their results indicated that an increase in banking sector consolidation weakens the bank lending channel of monetary policy transmission. They, however, submitted that recent banking consolidations raised the market share of large banks for which the supply of loans is less responsive to changes in monetary policy conditions.

To conclude the discussion on banking consolidation, the reviewed literature suggest that consolidation results in concentrated banking systems constituted of a small number of larger institutions. More so, some of the studies opine that large institutions benefit from the economies of scale. On that account, the impact of consolidation depends on the dynamics of the banking system. Additionally, literature submits that consolidation might account for the creation of SIFI whose failure could generate into systemic crises. On that account, this study examines the Nigerian DMBs to ascertain the extent to which the consolidation exercise of the 2005 banking reforms improved or derailed performance.

3.6   Regulatory Responses (Policy Initiatives) to the Global Financial Crisis

Recent literature suggests that the Basel III framework was a reaction of the Basel Committee to the episode of the global financial crisis, through which policy-makers world over sought to rectify the damage done to financial systems and economies through various forms of financial reforms. Therefore, to reposition financial institutions to mitigate against future financial and banking crises, several countries reviewed their regulatory frameworks. Notable mentions include the 2010 Dodd-Frank Wall Street Reform and Consumer Protection Act of the United States, and the splitting-up of the Financial Services Authority (FSA) of the United Kingdom into the Financial Policy Committee, Financial Conduct Authority (FCA) and the Prudential Regulatory Authority in 2013.

The aims of the Dodd-Frank Act are to enhance financial stability and to simplify the resolution of too-big-to-fail financial institutions while shielding taxpayers from financial losses (Cabral, 2013). In summary, the Dodd-Frank Act purposes to achieve its aims by enhancing existing regulatory framework with new regulatory institutions and new policy instruments (Skeel, 2011). In a bid to reduce the scope of regulatory arbitrage, the Act harmonises standards across agencies. The Act creates a new Financial Stability Oversight Council and a new Financial Stability Research Office. The Act also extended the scope of the Federal Reserve, the OCC, and the FDIC. Also, the Act extended the regulatory framework to non-bank and bank financial institutions that the Financial Stability Oversight Council deems "systematically important," to mean large bank holding companies that have consolidated assets of at least \$50bn (Cabral, 2013). In like manner, the Act also regulates most derivatives transactions, hence reversing the deregulation approach introduced by the Commodity Futures Modernization Act of 2000 (Davis Polk, 2010). In addition, the Act also created an orderly liquidation regime for large failing SIFIs (Skeel, 2011). In summary, the Dodd-Frank Act was designed with the goal of improving systemic crisis management through enhanced policy instruments and improved monitoring and evaluation of risks (Cabral, 2013).

Though the above suggest that the Dodd-Frank Act will improve banking regulation and supervision in the United States, some studies have reservations concerning the adequacy and ability of the Act. Concisely, for instance, Skeel (2011), Kane (2012), and Kupiec &

Wallison (2015) opine that the Act advances insufficient attention to capital and liquidity requirements, does not address the issue of regulatory capture, provides excessive discretion to regulators and supervisors, and fails to introduce rules-based procedures for resolution of large SIFIs. Additionally, Cabral (2013) submits that the Act limits bailouts as a response to crises. Most important of the criticisms of the Act is that it is largely unfinished since its implementation depends on ongoing rulemaking by US banking regulatory agencies (Cabral, 2013).

In like manner, the United Kingdom also adjusted its regulatory and supervisory framework following the episode of the global financial crisis. The new system of regulation saw the creation of three new bodies: The Financial Policy Committee (FPC), The Prudential Regulation Authority (PRA), and The Financial Conduct Authority (FCA) to replace the Financial Services Authority (FSA) from April 2013. The FPA is to be responsible for macro-prudential regulation (regulation of the ability and resilience of the financial system as a whole). The PRA assumes the prudential regulation (micro-prudential regulation) of all banks, building societies, insurers, credit unions, and major financial firms. While the FCA is responsible for conduct regulation, plus the prudential regulation of institutions not covered by the PRA. The FSA suggested that the overall objective of the new system of regulation is to produce a stable financial system that is resilient in providing vital financial services to a healthy and successful economy (FSA, 2012, Allen & Overy, 2013). In essence, financial regulation in the U.K was diversified so that different aspects of regulation will get the needed attention with the view of limiting unforeseen scenarios like the global financial crisis.

Conclusively, this section reviewed instances of regulatory responses to the global financial crisis from two major economies. The submissions above indicate that though the recommendations of the Basel Accords are highly regarded, individual economies design their regulations. More so, different countries responded differently to the global financial crisis (just like the 2009 Nigerian banking reforms), as they were affected in diverse ways. On the account, the next section dwells on a synopsis of literature on government rescue packages/measures and their impact on the performance of banking institution.

3.7   Government Rescue Initiatives

The rationale behind government intervention and fiscal policy has come under intense scrutiny in recent times because of the episode of the global financial crisis. Many governments were averse to the idea of bank failures as liquidation or bankruptcy of banking institutions may have devastating implications on the financial system and the economy of the country in the whole. To that end, governments adopted a host of rescue packages to prevent the collapse of affected banking institutions. Chang (2014) suggested that recuse packages adopted to stabilise banking institutions are divided into three main categories: government purchases of distressed assets, government guaranteed debt issuance programs, and direct equity capital injections.

On account of the above, the countries that were plagued and adopted various rescue initiatives include: Canada (distressed asset purchases), Italy (direct capital injections), Australia (asset purchases and guaranteed debt issuance), Japan and Switzerland (asset purchases and capital injections), Austria and Sweden (issuance and capital injection), Belgium, Denmark, France, Spain, Netherlands, United States of America, and United Kingdom (asset purchases, debt issuance, and capital injections) (Brei, Gambacorta, & von Peter, 2013; Chang, 2014). To be specific, a few of the above rescue packages are reviewed to set the tune for the analysis of the initiatives of Nigerian regulators within the period under review.

The central aim for adopting rescue packages is to support financial institutions in distress. However, this raises a vital question: Should distressed financial institutions be rescued by the government and therefore by tax payers? For one thing, rescue measures seem proper given that the bankruptcy costs for the economy would exceed the costs of the rescue. On the flipside, with a government as the lender of last resort, there is little incentive for institutions to take on sophisticated risk management strategies. Hence, the issue of moral hazard. In light of the above, the appropriate design of rescue packages seems the preferred route to safeguarding the financial system. To that end, the design of a rescue package should depend largely on the targets. To name a few, the stabilisation of financial systems through recapitalisation, taxpayer protection, and separation between good and bad management performance are examples of reasons why governments design rescue packages. Additionally, the costs associated with bank failure are not easily quantified, therefore

making it difficult to determine an exact trade-off (Breitenfellner & Wagner, 2010). The position above suggests that although rescue packages do not always achieve the objective of which they are designed, the role of government as the lender of last resort and the mandate to promote financial stability prevails.

Regarding the general effectiveness of rescue packages, Klomp (2013) examined the effectiveness of financial sector rescue packages advanced by national governments during the global financial crisis. The results suggest that there exists a significant negative relationship between various rescue packages and default risk. That is, government interventions have a negative impact on the change of the credit default premium. More so, the obtained results showed that the effect of the various rescue packages varied across banking institutions: most interventions do not have a significant effect on low-risk banks, while they affect high-risk banks. Additionally, Klomp found that interventions aimed at a specific financial institution are more effective than broad interventions taken to stabilise the financial system as a whole.

Kollmann, Roeger, & in't Veld (2012) in contributing to the intense debate on the efficacy of government stimulus packages opined that government support for the banking system can have a strong positive effect on real activity. In essence, support extended to banking institutions has a positive effect on investment, while a rise in government purchases crowds out investment.

Ait-Sahalia, Andritzky, Jobst, Nowak, & Tamirisa (2012) examined the impact of macroeconomic and financial policy announcements in the U.S.A, U.K, the Euro zone, and Japan during the recent global financial crisis. They found that market moves surrounding policy announcements suggest that markets viewed interest rates cuts and bank recapitalisation as the most promising policy steps to resolve the crisis. Secondly, they also found that domestic policy initiatives often had significant bearing on credit and liquidity risk premium in foreign interbank markets. Hence, international spillovers of policy announcements were amplified as the crisis deepened and policy makers doubled their efforts to restore financial stability. In addition, Ait-Sahalia et al. (2012) are of the opinion that system-wide rescue packages may be less effective because their impact is more difficult to gauge.

To be particular, the government of the United States adopted the Trouble Asset Relief Program (TARP) to help stabilise the financial system, restart economic growth, and avert

preventable collapses during the global financial crisis in 2008. The cornerstone of the programme was the purchase of equity capital in financial institutions. To that end, institutions like the American International Group, Citibank, and Bank of America got involved in the TARP programme. Consequently, the above banks were spared from collapse (Chang & Chen, 2016). Additionally, different studies have either hailed or criticised the TARP. Apart from preventing the collapse of some institutions, Berger & Roman, (2015) suggested that the TARP gave participating institutions a competitive advantage in raising deposits because they were perceived to be safer. On the contrary, Montgomery & Takahashi (2014) empirically examined the impact of the bank recapitalisation programme of the TARP and found evidence that overturned much of the existing literature on the effectiveness of capital injections into the banking sectors of the United States and Japan. Montgomery & Takahashi, (2014) showed that the TARP programme failed to achieve the stated policy objective of stimulating bank lending. More so, they found that banking institutions that received capital injections grew assets significantly slower, for the most part heavily risk-weighted assets such as loans. The submissions expressed suggest that even though government rescue packages forestall the collapse of banking institutions, they do not eliminate the problem of moral hazard.

Conclusively, this section reviewed the rationale behind the recourse to government rescue packages and enumerated countries that relied on at least one the three main categories of the rescue packages due to the episode of the global financial crisis. The experience of the U.S is presented to further indicate the diversity in literature concerning the debate of relying on rescue. However, even though the problem of moral hazard cannot be separated from government rescue packages, the ability of rescue packages in averting banking collapse cannot be faulted. Additionally, further government rescue initiatives are discussed under the section of financial safety nets.

3.8   Performance Measurement Approaches

Given the presentation of the importance of banking institutions to economic development and the rationale for embarking on banking reforms, this section dwells on the review of measures adopted in the evaluation of bank performance in different periods and

jurisdictions. Literature suggests that the measures fall predominately under three main approaches (Ratio analysis, Regression analysis, and frontier analysis).

3.8.1 Ratio Analysis

Considerable studies in an attempt to analyse and evaluate the performance of banking institutions have relied on conventional financial ratios (Ayadi, Adebayo, & Omolehinwa, 1998; Sharma, Sharma, & Barua, 2013). The return on assets (ROA) and return on equity (ROE) are the most popular and commonly utilised financial ratios for evaluating bank performance (Badreldin, 2009; Karr, 2005; Wilcox, 1984). Karr (2005) suggested that the ROA and ROE measures mostly correlate with each other and at the same time provide the same indication of performance related to the tendency and movement of financial performance. Although widely used, the shortcomings of adopting the use of financial ratios have been criticised on a large scale. Indicators such as the ROA and ROE only provide a narrow and incomplete picture of performance, while other financial ratio indicators may give contradictory results. Simply put, one principal disadvantage of financial ratios analysis is that each single ratio must be compared against a benchmark ratio one at a time while it is assumed that all other factors are fixed, and the chosen benchmarks are appropriate for comparison (Avkiran, 2011). Another main weakness of using financial ratios is that each ratio examines only part of a bank's activities and in the process fails to capture the multidimensional nature of banks, and thus it fails to provide enough performance information (LaPlante & Paradi, 2015). More so, financial ratios offer a retrospective and not prospective examinations and are based on accounting data, while neglecting economic data (Karr, 2005).

Examples of studies that relied on financial ratios to measure bank performance include: Kumbirai & Webb (2010) who used financial ratios to analyse the performance of commercial banks in South Africa from 2005 -2009; Kirikal, Sorg, & Vensel (2004) used a variant of the traditional financial ratios called DuPont Financial Ratios Analysis to examine the performance of Estonian banks. While Chandani, Mehta, & Chandrasekaran (2014) made use of financial ratios as computed from financial statements and the CAMEL model (a combination of financial ratios used by bank regulators) to ascertain the performance of domestic banks in India. Similarly, Sargu & Roman (2013) used the CAMELS framework to

analyse the financial soundness of commercial banks in Bulgaria, Czech Republic and Romania.

3.8.2 Regression Analysis

The regression analysis is a common methodology used in bank performance studies. The central advantage of regression analysis is that it allows for measurement errors and statistical inference. The advantage of regression analysis over traditional ratio analysis is that the effect of multiple independent variables on the dependent variable can be estimated simultaneously. More so, for instance, regression analysis can be used to provide information about the average performance of banks included in a given sample and this information can be utilised to estimate the expected performance of other banks (Paradi & Zhu, 2013).

Even though regression analysis is effective in a wide range of circumstances in measuring and ascertaining relationships between variables, it has some inherent limitations that make it unsuitable for utterly reflecting the increasing multifaceted nature of banking. One limitation of regression analysis is that it is a parametric method that requires a general production model to be specified. Another limitation of regression analysis is that it is a central tendency method in which predicted values results from a regression model provide the average or anticipated level of outcome given particular inputs, instead of the maximum realisable outcome. Also, regression analysis is only appropriate when modelling single input – multiple outputs or multiple inputs – single output systems (Paradi & Zhu, 2013; Tonidandel & LeBreton, 2011).

Examples of studies that utilized regression analysis in bank performance studies include: Alkhatib (2012) employed three indicators (ROA as a financial performance indicators, the Tobin's Q model as a market financial performance indicator and economic value added as an economic, financial performance indicator) to design a multi-regression model in order to measure bank performance in Pakistan. Doucouliagos, Haman, & Askary (2007) used regression models to explore the relationship between directors' remuneration and performance in Australian banks using panel data from 1992 to 2005. Using a three-stage least squares equation in addition to other regression models, Limpaphayom & Polwitoon (2004) examined the relationship between bank relations and market performance in

Thailand. Castelli, Dwyer, & Hasan (2012) used regression models to examine the connection between the number of bank relationships and firm performance in small Italian firms that are financed by banks.

In relation to the above and due to that extensive use of regression analysis in banking studies, this study uses panel data regression which is a variant of regression analysis to ascertain the determinants of bank efficiency, performance, and financial stability. This technique is further elaborated upon in the research methodology chapter of this study, while related empirical studies that adopted regression analysis to ascertain the determinants bank efficiency, performance, and financial stability in different jurisdictions and Nigeria are presented in subsequent sections of this chapter.

3.8.3 Frontier Efficiency Methodologies

In recent times, research employing the frontier approach has become popular (Paradi & Zhu, 2013). The frontier approach is perceived to be robust when compared to traditional financial ratios analysis as it offers further meaningful insight into the efficiency and performance of organisations (Berger & Humphery, 1997). Frontier efficiency methodologies are benchmarking technique based models that assess how well organisations (Decision Making Units – DMUs) are performing compared to the best performing organisation (DMU) that are doing business under the same operational conditions. The best organisations are identified from the data set, and they are used as the efficient frontier. Hence, organisations are not benched marked against some abstract assumptions but rather against performing organisations operating in the same business clime. A central advantage of this methodology over other indicators of performance is that it provides overall objective numerical efficiency scores including economic optimisation mechanisms in complex operational climes and sums up performance in a single statistic (Berger & Humphrey, 1997; Paradi & Zhu, 2013).

Correspondingly, frontier efficiency techniques can be utilised in numerous ways to assist management in assessing whether they are performing better or worse than their competitors (peers) regarding cost minimization, revenue, scale technology, and profit maximisation. Consequently, bank managements can utilise the resultant feedback from frontier efficiency analyses to identify operational areas that require improvement; ascertain attractive targets

for mergers and acquisitions; and set future development strategies. Frontier analysis can help provide recommendations to non-efficient organisations or institutions to improve their performance to catch-up with the efficient ones. More so, frontier efficiency analysis techniques can assist in determining the effects of environmental variables and achievable targets for inefficient organisations to provide further understanding into the production systems of organisations (Banker & Cummins, 2010).

Literature in the past three decades has led to the conclusion that there are five main frontier efficiency analysis techniques that have been employed in the evaluating performance and efficiency. The non-parametric linear programming approaches are Data Envelopment Analysis (DEA) and the Free Disposal Hull. While the other three approaches: Stochastic Frontier Analysis (SFA), Distribution-Free Approach (DFA) and Thick Frontier Approach (TFA) are parametric econometric models. These various approaches differ based on the imposed assumptions on the specifications of the efficient frontier, the existence of random error, and the distribution of the inefficiencies. The non-parametric linear programming approaches make use of few assumptions while identifying the best-practice frontier and they do not account for random errors. Whereas the parametric econometric approaches require a priori specification of the form of the production function, and characteristically they include an error term that captures inefficiency and random error. However, only the data envelopment analysis (DEA) and the stochastic frontier analysis (SFA) are commonly used in banking studies (Berger & Humphrey, 1997; Dong, Hamilton, Tippett, 2014; Thanassoulis, Boussofiane, & Dyson, 1996, Borger, Ferrier, & Kerstens, 1998).

In line with the above advantages ascribed to the frontier approach over ordinary financial ratios and regression analysis, this study employs the frontier approach in measuring bank efficiency and performance. To be specific, this study has adopted a variant of the DEA approach called the DEA Window analysis to obtain efficiency estimates for Nigerian DMBs for the period of 2000 – 2013. In that regard, the DEA approach is discussed in the research methodology chapter before narrowing down to the specific DEA window approach employed to estimate bank performance and efficiency in Nigerian DMBs. Nonetheless, studies that adopted the DEA approach are briefly reviewed below.

3.9   Data Envelopment Analysis (DEA) Empirical Studies

Sahin, Gokdemir, & Ozturk (2016) examined the effects of the global financial crisis on public, private, and foreign-capitalized commercial banks in the Turkish banking sector using an input-oriented approach. Adopting a study span of eight years and relying on the variable returns to scale DEA model (BCC), they found an increasing trend of efficiency during the global financial crisis. Also, they found that private banks were responsible for the decrease in the average efficiency of the Turkish banking sector as their input-oriented efficiency scores plummeted in the post-global financial crisis period.

Moradi-Motlagh & Babacan (2015) examined the efficiency of eight Australian banks using the bootstrap DEA method within the period of 2006 − 2012. The study found that the efficiency of Australian banks dropped considerably during the global financial crisis. They also pointed out that the efficiency of the examined Australian banks did not improve until in 2012 as all the banks showed low-efficiency levels in 2009.

Gulati & Kumar (2016) assessed the impact of the global financial crisis on the Indian banking sector. The study employed a DEA-based meta profit frontier framework that accounted for technological heterogeneity across different groups of banks. The results indicated that the efficiency level of Indian banks dropped mildly during the global financial crisis but recovered immediately after the crisis. The study, however, noted that the global financial crisis had a differentiated impact across ownership groups. The DEA results showed that private banks were the worst hit by the global financial crisis, while foreign banks performed better because of their adherence to best practices and access to superior technology.

The DEA model has been employed as a benchmarking tool to identify the most efficient institutions within a sample. However, very few studies have used it as a forward-looking alternative method to predict future bank failures and distress (Avkiran & Lin, 2012). Avkiran & Lin (2012) found out that the DEA can be used to identify distressed banks up to two years in advance. They indicated that the robustness test they carried out revealed that the DEA technique produces an efficient frontier and the discriminatory and predictive powers of the technique do not change even after perturbations. The further opined that the DEA technique could be employed as an off-site screening tool by regulators to gauge the

likelihood of financial distress. Simply put, the DEA technique can assist regulatory agencies, investors and managers in making vital economic decisions.

Other than using the DEA to examine bank performance and predict financial distress, other scholars used the technique for similar purposes. Pille & Paradi (2002) developed DEA four models alongside a Z-Score model modified by government regulators and the equity-to-asset ratio to detect financial failures in credit unions in Ontario (Canada). The foci of the study were the needs of government regulators, and they tested which models were best competent in predicting bankruptcy. Following the input-oriented model and using a pool of input and output variables, they suggested that the DEA technique was an adequate tool for detecting financial failures. Nonetheless, the study failed to present the preferred model or combinations of inputs and output variables that best detect financial failures.

Conversely, in a bid to extend the application of DEA in the banking sector, Kwon & Lee (2015) explored an innovative performance model for a two-stage sequential production process by combining the data envelopment analysis (DEA) and back-propagation neural network (BPNN). Contrary to several banking studies and the studies reviewed in this section, Kwon & Lee followed the DEA output-oriented model. They opined that DEA alone lacked predictive capacity, hence the combination with BPNN. They found that by combining DEA and BPNN, managers can predict the performance of DMUs previously not seen by the DEA alone. To that end, this study justifies the adoption of qualitative content analysis and panel data regression to increase the reliability of the research outcomes.

Similarly, Premachandra, Chen & Watson (2011) employed the DEA additive super-efficiency model to predict corporate failures and success in the United States. Using a sample of 50 large U.S bankrupt firms and 901 healthy matching firms, the findings of the study demonstrated that the DEA model was relatively weak in predicting corporate failures, as they found it to be better suited to predicting corporate success.

Furthermore, Alam (2013) calculated the technical efficiency of 70 Islamic banks from 11 countries using the DEA model and the seemingly unrelated regression (SUR) approach simultaneity to ascertain the relation between bank regulation and supervision on risk and efficiency. The results obtained indicate that regulations and strict monitoring of banking operations and higher supervisory powers of regulatory agencies translate to increased technical efficiency in Islamic banks, with higher restrictions resulting in reduced risk taking in Islamic banks. The study also revealed that even though Basel II and Basel III suggested

that very strict regulations and supervision may hamper banking efficiency. Nevertheless, the DEA scores in the study suggest that Islamic banks do not follow this trend, as they appear to be technically efficient in stricter regulatory climes.

In like manner, Pasiouras (2007) employed a two-stage DEA model to provide international evidence on the impact of regulations and supervision approaches on banks' efficiency using a sample of 715 banks from 95 countries. Using an input-oriented model, the results obtained show evidence in line with the view of the three pillars of Basel II, that banking institutions should adopt strict capital adequacy regimes, develop powerful supervisory agencies, and create disciplining mechanisms.

Furthermore, in addition to the studies reviewed in this section, Pasiouras (2007) suggest that most DEA studies in banking follow the input-oriented model. The input-oriented model identifies the efficiency of DMUs as a proportional reduction in input usage for a particular level of output (examples of studies that followed the input-oriented model include Raphael, 2013; Herrera-Restrepo., et al 2016; Paradi et al., 2004; Seelanatha, 2012; Sufian, 2011). Whereas the output-oriented model identifies DMUs can increase their output while keeping inputs at particular levels (Coelli et al., 1999). In addition to Premachandra et al. (2011), examples of studies that adopted the output-oriented model includes Attaullah et al., (2004); Ataullah & Le (2006). Hence, the large number of studies that employ the input-oriented model indicates that it is preferred above the output-oriented model. Moreover, it is claimed that the intermediary role of banking institutions suits the input-oriented model (Pasiouras, 2007).

Finally, the studies in this section buttress the ability of the DEA technique as an adequate measure for ascertaining the efficiency level of banking institutions. Additionally, some of the reviewed studies also relied on the DEA approach to predict financial distress. Therefore, the DEA technique is used to examine the efficiency of Nigerian DMBs as they went through the 2005 and 2009 Nigerian banking reforms, and ascertain whether it was able to identify DMBs that were in danger of collapse. None of the studies reviewed above adopted the DEA window technique, however, the few banking studies that made use of it are presented in the methodology section. To that end, the use of the DEA window technique, which is a variant of the conventional DEA technique, contributes to the literature on predicting financial distress.

The next section of this thesis centres on the review of regression analysis studies that made use of bank-specific CAMELS variables to show the determinants of efficiency, performance and stability. In relation to the studies reviewed above, the efficiency scores obtained from the DEA technique were used as dependent variables in the second stage regression analysis in several banking studies like in Pasiouras (2007), Premachandra., et al. (2011), and Moradi-Motlagh & Babacan (2015). In like manner, DEA efficiency scores are used as dependent variables in this study. Hence, the section below covers some recent banking performance (CAMELS) regression studies in various jurisdictions and periods.

3.10   CAMELS and Bank Performance

Maghyereh & Awartani (2014) are of the view that the examination of bank instability and distress is an important issue due to the following reasons:

- It enhances the ability of regulators in predicting financial crises, which consequently makes the management and coordination of supervision more efficient.
- The early distinction between sound and troubled banks allows appropriate actions to protect healthy institutions and prevent the collapse of distressed ones.
- The cost of bailing out distressed banks and restructuring a troubled sector is usually high and may consume amounts that could have been used for other developmental projects.
- A crisis in the banking sector may create other crisis, such as currency crisis, that may additionally weaken the economy, and increase the cost of distress.
- Finally, bank distress is usually accompanied by a credit crunch, which may further hamper growth in the economy.

Therefore, because of the above, the identification of appropriate variables to unearth banking sector problems has attracted enormous attention in research and literature.

The research to gain insight into banking distress and stability in financial literature has been developed around macroeconomic variables and bank-specific variables. On the one hand, the macroeconomic variables such as interest rate changes and inflation are perceived to be liable to either enhance or distress the financial performance of banks (Sahut & Mili, 2011).

Cordella & Yeyati (1998) are of the view that if there are widespread shocks to the economy and banks are incapable of controlling their asset portfolio risks, the full transparency of the risk position of banks may destabilise the banking system. More so, the microeconomic environment of a country may also affect transparency levels, and consequently make it difficult to relate to the financial performance of banking institutions (Sahut & Mili, 2011).

Even though macroeconomic variables are important tools for the timely detection of banking system instability, they do not analyse the impact of weaknesses inherent in individual banks that contribute to the occurrence of bank instability and distress. To be precise, models that make use of macroeconomic variables are unlikely to differentiate between distressed banks who have been hit by exogenous shocks, and those that various specific weaknesses may have led to systemic financial distress (Sahut & Mili, 2011).

Several studies suggest that models, which rely on macroeconomic factors to examine banking instability and distress, have several limitations. Macroeconomic focused models of examining banking distress do not provide sufficient information for use by bank supervisors as to which particular banks within the system are the most vulnerable and most likely to fail. This sort of assessment may mislead bank supervisors in dealing with issues at an aggregate level, and as a result introduce policies that could affect both weak and sound banks in less than optimal ways (De Graeve, Kick, & Koetter, 2008; Konstandina, 2006; Wheelock & Wilson, 1995).

Progressively, Konstandina, (2006) opined that using individual bank data for assessing bank performance and stability will be beneficial in discovering why and how. And even though all banks may have faced similar macroeconomic shocks, not all of them eventually experience distress or failure. Konstandina further suggested that the identification of specific characteristics inherent in distressed or failed banks compared to non-distressed banks can be used to advance monitoring techniques for better identification of banking instability and vulnerability in the future. Therefore, by examining the resolution and restructuring processes of healthy individual banks, best practices can be recommended to unhealthy banks and can be used for the resolution of distressed banks.

On the other hand, various studies have relied on micro-level and bank-specific variables to analyse bank instability and distress in specific countries or regions using cross-section, micro-level data. Thus, this section will review studies that made use of CAMELS indicators (Capital, Asset Quality, Management Quality, Earnings, Liquidity, and Sensitivity to market

risk) and bank-specific variables to measure bank performance, predict bank failures, and estimate the stability of banking institutions.

Numerous studies agree on the ability of the CAMELS approach in assessing financial vulnerability and predicting bank distress (Poghosyan & Cihak, 2011). In relation to capital adequacy, low capital and high volume of risky assets are major causes of bank instability and distress (Oshinsky & Olin, 2006). Banks with large capital cushions have the capacity to write-off bad loans in the future, which makes them less vulnerable to financial distress especially during financial crises as opposed to banks with weaker structural liquidity which may eventual fail (Chiaramonte, Croci, & Poli, 2015; Kick & Koetter, 2007). Berger & DeYoung (1997) suggested that low capital may spur moral hazard practices and riskier loan portfolios. While Santos (2001) opined that low capital increases the likelihood of bank failures. And to add, Gasbarro, Sadguna, & Zumwalt (2002) are of the opinion that capital adequacy declines as the result of continuing losses. The asset portfolio of banks plays a significant role in determining their health. However, the nature of exposures leading to failures varies in literature. In that manner, Barrell, Davis, Karim, & Liadze (2010) and Cole & White (2012) are of the view that real estate financing and construction are major causes of distress. Equally, Torna (2010) and DeYoung & Torna (2013) by examining bank failures during the global financial crisis enumerated five banking activities as sources distress: derivatives trading, securitization, insurance, investment banking, and venture capital investments. However, the only investment activity that advances bank survival and stability was brokerage.

Additionally, the quality of assets that banks create also matter. Various studies have stressed the substantial influence of variables like ex-post provisions taken against losses and non-performing loans (Barth & Landsman, 2010; Betz, Oprica, Peltonen, & Sarlin, 2014; Cardone-Riportella, Samaniego-Medina, & Trujillo-Ponce, 2010; Jin, Kanagaretnam, & Lobo, 2011; Ng & Roychowdhury, 2014). More so, credit growth in periods that precede financial crisis may contain predictive information about possible failures in the banking sector (Arena, 2008; Gonzalez-Hermosillo, 1999; Jin et al., 2011).

Managerial inefficiency has been found to be a significant contributor to bank distress (Barr, Seiford, & Siems, 1993; R. DeYoung, 2003; Wheelock, & Wilson, 1995; Wheelock & Wilson, 2000).

Likewise, considerable amounts of research are of the opinion that bank liquidity is equally integral to stability. Laeven (2011) suggested that liquidity played a big role in the recent banking crisis. Diamond & Rajan (2005) opined that liquidity stress due to the inability to raise deposits consequently leads to asset liquidation. Whereas, Wagner (2007) studied the temptation of banks to allocate more assets into risky marketable securities to avoid liquidity stress.

Therefore, the various submissions above present a consistency in supporting the importance of the assessment of the various CAMELS indicators in banks. They show that the various indicators bring to light the financial soundness and stability of banking institutions. Hence, the CAMELS methodology is an appropriate framework the assessment of the financial performance of banks.

Increasingly so, Maghyereh & Awartani (2014) empirically examined bank distress prediction in the Gulf Cooperation Council Countries with the aid of a simple hazard model which incorporates bank-level variables and other variables including the influence of regulation, bank management, diversification, competition, and ownership. They found that banks that are small, not adequately capitalised, banks with low profitability, banks with high volume of risk asset portfolios, and low liquidity are more disposed to distress than other banks. Likewise, as expected, they found that banks that are poorly managed are more likely to encounter troubles in the near future. Maghyereh & Awartani (2014) also found that non-intermediation activities are bad for the health of banks. And they concluded that CAMEL-type specific variables are important leading indicators to predicting bank distress in the GCC countries.

Also to predict bank financial failures, Boyacioglu, Kara, & Baykan (2009) employed twenty (20) financial ratios with CAMELS features. Using the CAMELS proxies, the study carried out multivariate statistical methods analysis, multivariate discriminant analysis, K-means cluster analysis, and logistic regression analysis to predict bank failure in the Turkish banking sector. The study showed that the CAMEL proxies could be employed as variables to predict banking failure. Thus, the results obtained indicate that a combination of methods makes the prediction of banking failure more accurate.

Atikogullari (2009) also made use of the CAMEL framework to analyse the performance of banks in the Northern Cyprus banking sector. The study focused on post-2001 crisis performance of the five largest banks in Northern Cyprus. The results obtained suggested that

the profitability and management quality of the assessed banks improved during the period under review, whereas a deterioration of capital adequacy and liquidity levels were identified.

Erol, Baklaci, Aydogan, & Tunc (2014) utilised the CAMELS approach to compare the managerial and financial performance of Islamic banks against conventional banks in Turkey. The study utilised the logistic regression method in the comparative performance analysis of the banks within the period of 2001 – 2009. The results showed that Islamic banks operating in Turkey performed better regarding profitability and asset management ratios. More so, Islamic banks lagged behind in sensitivity to market risk criterion as conventional banks performed better in managing their exposures to market risk. However, Erol et al., (2014) suggested that the variations in performance may be as a result of the fact that Islamic banks enjoy some form of tax advantages in addition to allowing for lower provisional losses compared to Conventional banks.

Also in a comparative study, Shen & Chang (2012) compared the performance of Taiwanese banks that are members of a Financial Holding Company (FHC) with independent banks from the first quarter of 2002 to the second quarter of 2006. Based on 14 performance ratios mirrored on the concept of the CAMEL framework, the study found that FHC banks performed better regarding capital adequacy, asset quality, and liquidity sufficiency. However, Shen & Chang found that FHC banks and Independent banks had equal profitability and management efficiency.

Numerous studies that employed the CAMELS approach have also been carried out on individual banks. For instance, Christopoulos, Mylonakis, & Diktapani (2011) analysed the financial particulars of Lehman Brothers from 2003 – 2007 using the CAMEL ratios. The scope of the study was to find out whether the collapse of Lehman Brothers was due to the effect of the global financial crisis or the result of internal malfunctioning which could have gone undetected by supervisory authorities. The results showed credits to be bad and doubtful, while the management seemed unwilling and reluctant to reverse the declining course. The CAMELS ratios indicated negative trends within the period under review; hence supervisory authorities should have foreseen the declining fortunes of Lehman Brothers and reacted accordingly.

Furthermore, in relation to the financial performance and stability of banks that have been involved in mergers, Koetter et al., (2007) employed the CAMEL approach to analyse approximately 1000 mergers in the German banking industry. Their study found that among

merging banks, improving financial profiles reduces the likelihood of distressed mergers more than the likelihood of non-distressed mergers. More so, the study also revealed that both distressed and non-distressed mergers have below average CAMEL profiles when compared to non-merging banks.

Also in relation to bank mergers during the global financial crisis and CAMELS, Dunn, Intintoli, & McNutt (2015) examined a sample of targets and acquirers involved in US commercial bank mergers during both pre-crisis (1st quarter of 2004 to the 2nd quarter of 2007) and crisis (3rd quarter of 2007 to the 4th quarter of 2010) sub-periods. Using proxies for components of CAMEL ratings employed by banking regulatory authorities, the study found evidence that targets have poorer performing assets than their acquirers during the global financial crisis. They also confirmed that Acquirers have equity share prices that are more sensitive to market risk during periods of the financial crises, but not so during the crisis. Consequently, this study shows that the CAMELS framework can be a tool for examining different scenarios; thus it furthers the need for a CAMELS study in the Nigeria banking industry due to the various regulatory assisted and non-regulatory assisted mergers prior and after the global financial crisis.

Mckenzie & Keneley (2011) embarked on a CAMEL analysis to evaluate the performance of two Australian banks and two insurance companies before and after privatisation. The study tested the hypothesis of whether bank performance was different after privatisation; however, the results from the banks did not support the hypothesis. The study did not find any particular difference in the performance of privatised institutions with other private institutions both before and after privatisation. As a result, this shows that privatisation in Australian financial institutions does not necessarily result in above average CAMEL profiles.

Finally, even though all the studies reviewed thus far show that the CAMELS framework is an appropriate tool for measuring the financial performance of banks and bank stability. The results obtained indicate that generalisations cannot be made with results from various studies, owing to the reason that even banks of different orientations in the same country or region indicate variations in results. For instance, Conventional banks outperform Islamic banks in some countries, while the reverse is the case in other countries. More so, merged banks which become megabanks show glowing CAMELS ratios in some countries and very low ratios in others, while small banks perform better in some jurisdictions and worse in

others. Therefore, these variations support the view that CAMELS based studies should be carried out in individual countries per bank and year.

Additionally, it can be observed that CAMELS indicators can be used in various ways. Some researchers use CAMELS proxies in stand-alone studies to examine bank performance and bank stability, while others use them as variables in multiple regression analysis, factor analysis and logistic regression analysis. The flexibility and effectiveness of the application of the CAMELS framework make it appealing for adoption. However, the fact that there is no consensus of which financial ratios/variables most accurately measures the CAMELS components is a minus in its application. But this disadvantage can be overlooked as more than one financial ratio/variable can be used in each of the components, thereby increasing its effectiveness in analysing bank performance and stability.

3.11   Financial and Banking Stability

Financial markets within the last three decades have experienced accelerated growth by way of technology adoption, product innovation and sophistication, in addition to sectoral and geographic integration. This rapid development of financial markets despite contributing to enhanced financial stability may also complicate the benefits and translate into new sources of risks to financial systems (Swamy, 2014). More so, no single financial system is a mirror of the other as they are made up of different institutions, and are supervised by different regulatory agencies. These various peculiarities make financial systems unique, hence the dilemma of ensuring stability.

Therefore, it is in a bid to understand what financial stability entails and how it can be estimated that this section dwells on the various definitions of financial stability and banking stability in particular, in addition to the review of related literature. Moreover, the Z-score, which is the adopted banking stability indicator, is elaborated upon in the research methodology chapter.

3.11.1 Definition of Financial Stability

Although it is extensively used, the literature suggests that financial stability is difficult to define and measure based on the various submissions by academics and scholars. Financial stability as a concept is hazy with no acknowledged definition. However, several attempts have been made to define financial stability. Financial stability relates to the smooth functioning of the constituent parts of the financial system which includes, financial markets, financial institutions, and payments, settlement, and clearing systems (Cihak, 2007; Klomp & Haan, 2009).

In line with the above view of financial stability, Alastair (2008) suggested two competing notions. The first view has to do with the robustness of the "financial machinery", that is of the institutions, which operate in financial markets, the market mechanisms themselves, and activities which include the payment systems, clearing systems and settlements processes that underpin markets. In keeping with this view, maintaining financial stability translates to avoiding serious disruptions in the operation of the financial machinery, such that the entire financial system can continue to perform functions expected of it. These functions include the provision of a store of value, facilitation of transactions (in goods, services, financial assets, etc.) and the provision of a mechanism for allocating savings. And in addition, this should ensure the stability of the monetary transmission mechanism. Whereas, the second conception does not dwell on the robustness of the financial machinery but on what the machinery offers regarding asset prices and financial flows, with particular focus on their stability or volatility. Put differently; it is the notion that a financial system may be structured to operate in such a manner that encourages or even allows, an "excessive" degree of volatility (Alastair, 2008).

Progressively, the European Central Bank defines financial stability as "a condition in which the financial system, comprising of financial intermediaries, markets and market infrastructures is capable of withstanding shocks, thereby reducing the likelihood of disruptions in the financial intermediation process which are severe enough to significantly impair the allocation of savings to profitable investment opportunities" (ECB, 2015).

More so, Schoenmaker & Siegmann (2014) view financial stability in relation to systemic risk, which they view as "the risk that an event will give rise to a loss of economic value or confidence in a substantial section of the financial system that is weighty enough to have

serious adverse effects on the real economy". Moreover, given the intertwined nature of the concepts of systemic risk and financial stability, threats to financial stability are considered to create systemic risks. Thus, the Committee on Global Financial Stability (2010), view systemic risk as "the risk that disruptions to financial services caused by impairments to the whole or parts of the financial system are capable of having serious negative consequences for the real economy".

Additionally, Morgan & Pontines (2014) are of the view that a financial system is stable when it is capable of facilitating positive economic performance by dissipating financial imbalances that arise inherently or as a result of unanticipated and adverse events.

A look at all the views and definitions of financial stability above show that they lay emphasis on the ability of financial systems (financial markets, financial institutions, payment, clearing and settlement systems) to withstand shocks and have the capacity to effectively perform the basic functions of intermediating savings and investments in the real economy. What is central to all the definitions and views of the concept of "financial stability" is that the individual components of financial systems are capable of functioning in ways that mitigate risk both in periods of financial bliss and financial crises.

To be specific, this study is centred on banking institutions, and in line with the definitions of financial stability presented above, it is appropriate to zero down on the meaning of banking sector stability or soundness.

Swamy (2014) opined that the banking sector is a part of the financial system, however, it is the most central part of the financial system in most emerging economies and it is the main source of risk for financial stability. Swamy suggested that banking stability is the benchmark to determine whether an economy can withstand both internal and external shocks. More so, financial stability is the result of stability conditions prevailing in the banking system, financial markets, and the real economy and amongst them. Thus, banking stability is integral of financial stability (Swamy, 2014).

Lindgren, Garcia, & Saal (1996) perceive bank soundness as the ability of a bank to withstand adverse events that may take the form of bank runs, major policy changes, financial sector liberalisation and natural disasters. Therefore, it reflects the ability of a bank to be solvent and stay so even under difficult economic conditions by way of their capital and reserve accounts.

Additionally, Jokipii & Monnin (2013) refer to banking sector instability as the probability of the banking sector becoming insolvent within the next quarter. They considered a banking sector to be insolvent when the market values of the assets owned by all the banks in the country are not sufficient to cover the total debt at a particular point in time.

The views presented above press on the fact that the stability of banks is crucial for financial stability as a whole and economic growth. Likewise, as there is no generally accepted definition of financial stability or banking stability, different studies make use of different indicators to measure and estimate financial stability and banking stability. However, to avoid misconceptions, financial stability and banking stability are used interchangeably in literature. This study therefore dwells on banking stability with a view of making revelations that will affect financial stability.

3.11.2 Financial and Banking Stability Studies

Literature centred on banking stability indicates that numerous factors determine the soundness of banking systems. Below is a review of literature on bank stability and the various factors or elements that seem to derail financial stability and economic growth.

Jokipii & Monnin (2013) explored the relationship between banking sector stability and the consequent evolution of real output growth and inflation in a sample consisting of 521 banks covering 18 OECD countries. Their study sought to capture the extent of stability by estimating the distance-to-default for the various banks involved in the sample. The adopted VAR model showed that banking sector stability is significant for GDP growth. Jokipii & Monnin also suggested that periods of stability are on the whole followed by an increase in real output growth, whereas instability translates to periods of reduced growth. More so, they opined that a stable banking sector reduces uncertainty in real output growth.

In relation to the recent global financial crisis, a host of scholars in addition to the various other causes of the crisis blamed the use of derivatives as one of the main sources. Keffala, (2015) investigated whether the use of derivative instruments was responsible for the magnification of the global financial crisis. Keffala measured the effect of the use of derivatives on the stability of banks from emerging countries within the period of 2003 – 2011. The study employed the use Generalised Methods of Movements (GMM) estimator

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technique and made use of the Z-score as the dependent variable. The results of the study showed that forwards and swaps are not disruptive factors, whereas futures and to a large extent options can contribute to bank instability in emerging countries. Keffala (2015) concluded that options and futures, and not forwards and swaps should be considered risky and partly responsible for the amplification of the global financial crisis.

Additionally, given the various takeovers and purchase assumptions agreements that ensued in most banking systems around the world in recent times, especially after the global financial crisis, Gomez (2015) examined the effect of failed banks takeovers on financial stability. Gomez presented two opposite views. First, Gomez (2015) asserted that incumbent takeover might enhance financial stability due to the incentive to be solvent to benefit from the failure of competitors. Secondly, the incumbent takeover of failed banks may derail financial stability by creating "Systemically Important Financial Institutions".

Furthermore, regarding the relationship between market power and bank stability that focus on concentration, two views exist in literature: "concentration stability" and "Concentration fragility" (Bretschger, Kappel, & Werner, 2012; Fu, Lin, & Molyneux, 2014). Advocates of the "concentration-stability" view (e.g. Allen & Gale, 2004; Beck, Demirguc-Kunt, & Levine, 2006; Chang, Guerra, Lima, & Tabak, 2008) are of the opinion that larger banks in concentrated banking sectors scale down financial fragility through at least five (5) channels:

- Larger banks are more likely to increase their profits, thus building up high "capital buffers, which allow them to be less prone to liquidity or macroeconomic shocks;
- Larger banks have the capacity to increase their charter value, and this consequently dampens bank managers' appetite of excessive risk taking;
- The monitoring of few large banks is easy and uncomplicated. This increases the efficiency of supervisory authorities, and consequently translates to a reduction in the risk of a system-wide contagion;
- Larger banks are equipped to provide credit monitoring services; and
- Given higher economies of scale and scope, larger banks have the capacity to efficiently diversify their loan portfolio geographically through their cross-border activities/operations.

Chang et al. (2008) examined the stability-concentration relationship in the Brazilian banking system. The Brazilian case aligns with the main intuition of the concentration-stability view

that banks in largely concentrated banking system can diversify their loans, while also improving their risk-return trade-off. Likewise, Beck et al. (2006) using data from 69 countries over the period of 1980 – 1997 indicated that financial crises are less probable in more concentrated banking systems.

On the other hand, proponents of the "concentration-fragility" view (e.g. Boyd & De-Nicolo, 2005; Caminal & Matutes, 2002) are of the opinion that larger banks in a concentrated banking sector weaken stability through three channels:

- Larger banks are perceived to be too-big-to-fail institutions, which will be rescued through government guarantees, and consequently making the moral hazard problem more severe;
- Larger banks usually charge high loan interest rates by their market power, which may encourage increased risk-taking amongst borrowers to compensate for such high rates, and the repercussion could be increased default risk; and
- The managerial efficiency of a large bank in areas such as risk diversification in assets and liabilities may decline with time, and consequently resulting in high operational risk.

Uhde & Heimeshoff (2009) provided empirical evidence that national banking market concentration has a negative impact on the financial soundness of European banks over the period from 1997 to 2005 as measured by the Z-score technique while controlling for bank-specific, macroeconomic, regulatory, and institutional factors. The result of the analysis revealed that Eastern European banking markets that are characterised by a higher fraction of government-owned banks, fewer diversification opportunities, and lower levels of competitive pressure are more prone to financial instability, while capital regulations were found to support banking stability.

In addition to the above and with regards to the effect of market power, Nguyen, Skully, & Perera (2012) explored 151commercial banks from four South Asian countries (Bangladesh, India, Pakistan and Sri Lanka) within the period of 1998-2008. The findings indicated that South Asian Banks with greater market power performed better and were more stable when their activities transcend traditional banking activities. More so, Nguyen et al. (2012) further found that higher market concentration led to increased competitive pressure, which gave rise

to increased lending to low-creditworthy customers that consequently materialised in higher non-performing asset ratios for less banking institutions.

Soedarmono, Machrouh, & Tarazi (2011) based on a sample of commercial banks from 12 Asian countries over the period of 2001 – 2007; found out that greater market power in the banking sector translates to higher instability. They suggested that although banks in less competitive markets were better capitalised, their default risk remained higher; however, they indicated that such behaviour is dependent on the economic environment.

Bornemann, Homolle, Hubensack, Kick, & Pfingsten (2014) examined the motives for the creation and usage of General Banking Risk (GBR) Reserves in German banks and assessed their role in financial stability. They found that GBR reserves are primarily created for the sole purpose of building up Tier 1 capital for the management of regulatory capital and earnings management. Additionally, the results indicated that banks using GBR reserves are less likely to experience financial distress or default events. Bornemann et al. (2014) further concluded that the existence of GBR reserves serves both as a convenient capital earnings management tool for bank managers and as a regulatory instrument for the enhancement of bank stability.

Maudos & Fernandez De Guevara (2011) analysed the relationship between bank size, market power and financial stability. They used data panel from banks in 25 EU countries, the US, Canada, and Japan in the period of 2001 – 2008. In relation to financial stability, Maudos & Fernandez De Guevara (2011) suggested that an increase in market power leads to greater stability. They hold that this view supports the traditional notion that excess competition in the banking sector can be harmful to financial stability. They also asserted that although size has a negative effect on financial stability, the corresponding relationship is not linear with respect to very big banks, as an increase in size decreases the probability of bankruptcy.

Creel, Hubert, & Labondance (2014) used the seminal work of Beck & Levine (2004) and adopted the same variables and econometric method to estimate the link between economic performance and financial stability in European countries, while also independently controlling for the level of financial depth. They tested how different measures of financial instability (microeconomic indicators, institutional index, and derived statistical index – principal component analysis) affect economic performance. And they found out that financial instability has a negative effect on economic growth.

Swamy (2014) employed a robust panel of 56 Indian banks covering the period from 1996 to 2009 to measure the degree of volatility and soundness in the Indian banking sector. The study made use of a micro vector autoregressive (VAR) model and corroborated the significance of the interrelatedness of bank-specific variables such as capital adequacy, asset quality, liquidity and profitability. Swamy provided empirical evidence for the centrality of banking system stability for aiding financial stability in the context of banking dominated emerging economy (India). The results showed that within the period of 1996 to 2009, the Indian financial system and in particular the banking system demonstrated continued stability when compared to other countries.

Chiaramonte et al. (2015) investigated the accuracy of the Z-score on a sample of banks from 12 European countries over the period of 2001 – 2011. The study examined whether the Z-score is a valuable model for predicting bank distress relative to the CAMELS-related covariates, and if its ability to signal bank distress differs through the period, bank size, business model (shareholders/stakeholders oriented banks), and geographic region. Using probit and survival analysis models, the study found that the Z-score is largely a valuable and fewer data demanding measure of predicting bank distress. They opined that the ability of the Z-score to predict bank distress over the entire period of the study (2001 – 2011) and in the crisis years (2008 – 2011), is to some extent as good as more data demanding models, such as the CAMELS model. Additionally, Chiaramonte et al. (2015) suggested that the Z-score is a more effective predictor for commercial banks and in particular large banks. In particular, to the sample, the study indicated that the Z-score was relatively more successful in predicting distress and non-distress events in the European countries that were less affected by the financial crisis.

Conclusively, the views expressed by the financial and banking stability related studies indicate that several factors influence stability. Though the studies show that the Z-score is a popular indicator of stability, its determinants vary according to periods, business cycles, jurisdiction, type of banking institution (Conventional or Islamic), and customer base. In summary, the size of banking institutions, banking concentration levels, ownership structure, macroeconomic circumstances, earnings, liquidity levels, and management structure amongst others influence financial stability in the whole. To that end, studies to ascertain the changing and dynamic factors that influence stability must be regularly embarked upon. Thus, the various determinants highlight the rationale to ascertain the factors that determine the stability of Nigerian DMBs.

3.12 Financial Safety Nets

Nigerian regulators relied on a couple of financial safety net initiatives to prevent the collapse of deposit money banks in recent times. On that account, this section dwells on the discussion of financial safety nets and the particular initiatives (bailouts and bridge banking mechanism) adopted by Nigerian regulatory authorities to avert banking collapse in the Nigerian banking sector.

Due to the failures of several banking institutions and the events that unfolded during the recent financial crisis, significant attention from academics, policy makers and the general public at large has been directed towards policy responses that are meant to protect shareholders of financial institutions, customers and taxpayers when financial excesses threaten. The global attention vested on policies that border on financial stability are because banking crises usually involve huge cost not only to the banks and their shareholders but also to customers and taxpayers, and more broadly they affect the economic indicators like unemployment, money supply and the Gross Domestic Product (GDP). For Instance, when the lending capacity and payment systems of banks are disrupted during a banking crisis, there are usually reductions in investments outlays. And to manage the effects of banking crises, national governments often incur large costs (Demirguc-Kunt, Kane, & Laeven, 2008).

Therefore, to ensure financial system stability and to reduce the huge cost involved in remedying banking crises, various countries have at one point, or another introduced "financial safety nets". White, (2004) suggested that the term "safety net" is often used to depict the instruments and methods employed by governments to mitigate and manage damages in the event of difficulties in their financial systems. The instruments and methods considered are both micro and macro in nature. The micro instruments include deposit insurance schemes (explicit and implicit), short-term liquidity support to financial institutions, government guarantees, crisis coordination, and exit policies. While the macro instruments are in the form of easing monetary policies and support from the International Monetary Fund (IMF). For the sake of this research, this section will dwell only on the micro instruments (deposit insurance and bank bailouts). In the current financial landscape, where we are facing the aftermath of a major financial crisis, recent literature on banking regulation consider financial safety nets in the light of crisis management more than crisis prevention.

Though the main and enduring criticism of the use of financial safety net instruments is based on the economic theory of moral hazard, financial safety nets can equally be employed to mitigate the damages that arise during periods of financial difficulties (Morrison & White, 2011). While it is understood that financial safety net provisions encourage imprudent risk-taking by bank management, both national and international regulators have in recent times further emphasised the important role played by financial safety nets in crisis management. Thus the increased recourse to the use of financial safety nets by governments following the global financial crisis is worth researching.

The above also tends to present the dilemma whether the moral hazard problem remains serious enough to merit considerable attention from regulators and supervisors based on the assumption that the "good design" of the safety net instruments could to a large extent limit the moral hazard problem, as could better regulation and supervision.

3.12.2 Financial Safety Net Issues

The need for effective resolution techniques to assist countries in dealing with financial difficulties was fortified by the event of the global financial crisis. The need to strengthen financial resolution techniques has become the priority of regulators and governments (Azis, 2013).

Economic literature seems to agree that financial safety net instruments are required to limit the damages caused by financial crises and bank failures. Schich (2008) argued that without the presence of an appropriate financial safety net, news of problems concerning solvency or liquidity of a financial institution can be blown out of proportion and result in a full-blown financial meltdown. He further opined that when an appropriate financial safety net is employed, depositors' confidence in the financial systems tends to be high and the incidence of bank runs and panic are less likely to occur.

Most definitions of financial safety nets are limited to deposit insurance and the lender of last resort function. For the purpose of this study, financial safety nets discussions will dwell on the elements of bank bailouts and bridge banking. Each of these instruments presents a similar trade-off. They are all designed to mitigate financial difficulties emanating from bank failures on the one hand. While on the other hand, if they are not properly designed to reduce

the effect of moral hazard, they can further increase financial fragility, which they were designed to minimise. To emphasise, governments and regulatory agencies must ensure that the benefits of choosing any particular instrument must outweigh the risk of moral hazard(Davis & Obasi, 2009; Demirguc-Kunt, Kane, & Laeven, 2008). Thus, Demirguc-Kunt & Detriagiache (2000) suggested, financial safety nets are difficult to design and implement due to the conflicting objectives of protecting customers and reducing the incentives of banking institutions to engage in risky activities.

Events based on the recent financial crisis have presented a dilemma concerning the type of institutions that should be covered by financial safety net instruments. The focus of financial safety net instruments in the past was predominately on deposit taking institutions like commercial banks. Commercial banks use to be the only systematically important institutions, but with the advent of financial innovation, traditional distinctions between financial activities, including securities dealing, derivatives trading, and asset management have changed the financial terrain. More so, financial institutions have witnessed closer and more complex inter-linkages in the financial landscape, therefore exposing banks to more universal risks and spill over effects. Also, traditional banks have all evolved, and other financial institutions have also become systemically important. For the scope of this study, financial safety nets will only be discussed in relation to commercial banks (Barth et al., 2013).

Furthermore, in a bid to manage the aftermath effects of the recent financial crisis, financial safety nets have been enhanced mainly because existing mechanisms have been viewed to be deficient. Pickford (2011) opined that insufficient amounts of financial outlay to make available adequate liquidity to offset private outflows and convince markets, and insufficiently flexible ways to disburse funds to financial institutions in difficulties make a case for enhanced financial safety nets.

More so, in the last four years, the level of financial resources offered for support operations have substantially increased. Apart from enhanced individual national arrangements to deal with the spillover effects of the financial crisis, regional and international set-ups have made available a variety of financial resources. For instance, the International Monetary Fund (IMF) at the London G20 Summit in 2009 tripled the IMF resources, at the same time created, and strengthened the regional financing arrangements (RFAs). The immediate reaction by the international community when the financial crisis became full-blown was to

channel liquidity through an IMF initiated network of central bank swap arrangements to aid finance-affected countries. Similarly, the European Balance of Payments Facility for non-Eurozone countries, alongside the European Financial Stabilisation Mechanism made available to all EU members, which were enlarged in 2010 by an additional mechanism to support countries in the Eurozone that were experiencing crisis (European Financial Stability Facility). In the same light, the Chiang Mai Initiative (CMI) that was set up in the wake of the Asian financial crisis as a mutual support mechanism among the 13 ASEAN+3 countries, was considerably strengthened to the tune of $120 billion as a self-managed reserve pooling arrangement (IMF, 2011; Pickford, 2011).

However, despite these incentives and innovations, the existing solvency and liquidity resolution techniques and mechanism available to financial institutions have sometimes proved inadequate. For the sake of this study, the bailout strategy and the bridge banking mechanism are reviewed due to their recent application in the Nigerian banking sector.

3.12.3 Bank Bailouts

As the importance of banking institutions as a tool for economic growth continues to increase, the need to ensure stability in financial institutions has become vital. The incidence of financial difficulties and banking crises have become more frequent in recent times, the need for urgent intervention to ensure financial stability has also become more intense. Policymakers have been presented with the dilemma of allowing financial institutions to either collapse or bail them out by providing liquidity for them to continue operations. Allowing an institution to fail results in loose of confidence in the financial systems, and this could lead to the failure of other financial institutions. While the bailout of an institution results in the use of taxpayers' fund, which lots of studies argue could result in moral hazard(Gorton & Huang, 2004; Smith, 2011). Likewise, Poczter (2012) is of the view that the most controversial element of many governments' responses to the recent financial crisis is the bailout of the banking sector. Advocates of the bailout arrangements believe they add liquidity during periods of financial difficulties and facilitate financial systems recovery. On the hand, policymakers and scholars who do not support the provision of bailouts and similar arrangements argue that they result in moral hazard because bank managements assume more risk due to the believe that government will bail out any eventual losses. Also, Smith (2011)

in his study on the dilemma of bank bailouts indicated that bank bailouts are disliked because:

- They are an abuse of taxpayers' funds, which could be used for infrastructural development, and
- Bailouts disregard the free-market theory that holds that they prevent market forces from naturally correcting market defects.

Hence, this dilemma presents the need to study the impact of financial safety nets (bailouts) on financial stability and bank performance.

Gorton & Huang (2004) argued that governments can effectively provide liquidity. They opined that governments are better placed to bailout banks; hence, they can inject liquidity more efficiently than private investors when banks are in distress. The rationale of governments world over to implement bailout policies, and similar arrangements rest on their intent to stabilise the banking sector and ensure banks carry out their intermediary roles. The questions that should be asked at this junction are "Will bank bailouts ensure long-term financial stability? And how will bank bailouts policies be designed to promote effective bank performance and financial stability? So, before seeking to answer this question in regards to the scope of this study, it is important we look at existing literature on the subject of bank bailouts.

Furthermore, Grossman & Woll (2012) indicated that bank bailouts are a function of economic pressures, so governments have no choice but to intervene during periods of financial difficulties. Progressively, they engaged in a comparative analysis of bailouts in different economies. They illustrated that the comparison of the Danish and Irish financial systems showed that they both experienced similar types of exposures to the recent financial crisis, but their bailout arrangements differed. The government handled the Irish bailouts of the banking sector, while the private sector in Denmark participated alongside the government, meaning only minimal amount of tax payer's money was used. Denmark was not alone in this approach, as the study also indicated the private sector coordinated with the government in France to bail out the French banking sector. Additionally, the British government initially wanted to rely on private takeovers but had to inject funds and nationalise banks like the Royal Bank of Scotland (RBS) and Lloyds TSB in the wake of the financial crisis.

Most research and attention in recent times that centre on bank bailouts stem from the fact that the cost of bailing out banking institutions are huge and the consequence of these costly interventions worldwide are unknown (Poczter, 2012). Poczter in her study on the long-term effects of bank bailouts in Indonesia opined that though the rationale for government intervention (bailouts) is to reduce systemic risk and restore lending, the injection of liquidity to save banks from collapse might create long-term incentives to engage in excessive risk-taking. She also suggested that recent critics of the U.S bailout programme implemented through the Troubled Assets Recovery Program (TARP) have indicated that bailed out banks are not increasing lending but rather channelling the capital received elsewhere. Similarly, Giannetti & Simonov (2013) argued that government intervention (liquidity support) for bad banks encourages bank management to engage in worse lending decisions.

Dell'Aricca & Ratnovski (2012) revisited the link between bailouts and bank risk taking. They opined that government intervention in the form of bailouts creates moral hazards and encourages risk-taking. Though acknowledging that bailouts have moral hazard effects that encourage risk-taking, Dell'Aricca & Ratnovski showed that when there are risks externalities across banks, bailouts also protect prudent banks against contagion. To that end, bailouts are not in themselves bad. Hence, they suggested that bailouts should encourage adequate supervision and monitoring to reduce bank risk taking.

Furthermore, Giannetti & Simonov (2013) are of the view that theoretical evidence on bank bailouts indicate that the real effects of bailouts depend on the size of the recapitalizations, the quality of the banks' clients and the banks' ability to meet capital requirements. In this line of thought, Bhattacharya & Nyborg (2011) argued that to be effective, the injection of liquidity must be large enough to solve the debt problems of banks. If the recapitalization is not enough, it would be ineffective in spurring bank lending and preventing a bank run or failure.

Recent empirical evidence on the long-run benefits of bank bailouts is limited. Related literature on bank bailouts try to present arguments for or against bank bailouts and how governments are to inject capital and who to receive them. For instance, Giannetti & Simonov (2013) argued that bailouts should be designed in ways that will not alter ex-ante lending incentives of banks. While Diamond (2001) suggested, governments should only extend bailouts to banks that have specialised knowledge about their borrowers. This assertion holds that banks that grant loans without due process should be exempted from

bailouts. In another perspective, Diamond & Rajan (2005) opined that bank bailouts should not be given to failing banks because it could backfire by increasing the demand for liquidity and result in further insolvency. These arguments go to show that no study has provided an optimal solution to the dilemma of bank bailouts.

In like manner, De Caux, McGroarty, & Brede (2016) analysed the long-term costs and benefits of bailout strategies in banking systems. They found that bailouts serve as effective tools that limit the occurrence of bank failures in the short-run. However, inappropriate intervention strategies hearten risk-taking, which renders bailouts inefficient and disadvantageous to long-term system stability. Hence, bailouts should be accompanied with strategies that enhance risk management practices.

Bank bailouts have been granted to different banks and in various banking sectors. The evident benefit was that some of these banks were saved from collapse. Conversely, the real problem remains in some countries, as governments have not been able to find lasting solutions to the bailed out banks. Some of these banks have been nationalised and finding buyers have proved difficult. For instance, Royal Bank of Scotland (RBS) and Lloyds Bank have not been able to find worthy buyers. The fact that the banks remain in the control of the government (politicians) also presents a different dimension. Governments come and go, meaning different governments with different policies and financial institutions like banks require some form of stability to function at optimum.

The submissions above show that moral hazard has remained the cardinal problem of bailout strategies. The bailout strategy seems to be a temporary fix as it forestalls the collapse of banking institutions in the short term. However, it does not prevent nor guarantee that bank executives will not engage in risky ventures. The inability of bailout strategy to overcome the moral hazard problem suggests that regulatory authorities will continue to experiment until they come up with the most suitable strategy that does not require the use of taxpayer's funds. To that end, Nigerian regulators employed the bridge banking mechanism after it experimented with the bailout strategy in 2009. The bridge banking mechanism is therefore presented below.

3.12.4 Bridge Banking Mechanism

Nigerian regulators employed bank bailouts and bridge banking in recent times. The bailout resolution strategy was addressed in the proceeding section, while this section focuses on the bridge banking resolution mechanism.

Carmassi, Luchetti, & Micossi (2010) suggested that the bridge banking special resolution tool is in two parts. A newly licensed banking institution under the supervision of the regulatory authority with the mandate to carry on the performing assets, including part or all of the deposits and other liabilities. The impaired assets and remaining share of liabilities stay with the residual banking institution that is subsequently closed and liquidated. If reorganisation of the banking institution fails, this technique lets operations to continue in the bridge bank, while the residual banking institution's operational licence can be revoked and liquidated.

The view of what a bridge bank is by the BIS somewhat differs from that presented above. The BIS is of the opinion that the bridge banking resolution technique allows certain critical functions and viable operations to continue until a permanent solution can be found. Regulatory authorities close the unsound bank and mark it for liquidation. Consequently, a new bank, referred to as a bridge bank, is licenced and placed under the control of the liquidator. Regulators should have the power to establish the terms and conditions under which the bridge bank can function as a going concern. The liquidator has the mandate to determine which assets and liabilities are transferred to the bridge bank. Hence, the assets and liabilities that are not transferred to the bridge bank remain with the liquidator. Therefore, a bridge bank is primarily designed to bridge the gap between the failure of a bank and the time when the liquidator can evaluate and market the bank to a satisfactory third party. Additionally, it accords ample time to potential purchasers to assess the bank's condition to submit their offer without interrupting service to bank customers (BCBS, 2015).

Literature evidence indicates that the bridge banking mechanism has not been widely explored. Hence, the theoretical position of the submissions. On that note, this study relies on the efficiency scores produced by the DEA window analysis to evaluate whether the bridge banking mechanism is a good fit.

Finally, the evidence presented after the recent financial crisis makes this study to conclude that financial safety nets typically evolve after financial crises. Like in the aftermaths of the following events, the great depression of the 1930s that led to the adoption of some form of deposit insurance by the US in 1934. The Asian Crisis of 1998, which resulted in the formation of the Chiang Mai Initiative that was further enhanced after the 2007 financial crisis and the several bank bailouts in the US, UK and other countries. These examples and those mentioned in the above paragraphs show that financial safety nets have over time been able only to enhance customer confidence during financial crises, but do not prevent the occurrence of the crises.

Consequently, the recourse to the use of financial safety nets has been on the rise, and the problem of moral hazard remains central. The use of these safety nets to address short-term issues in financial systems may have long-term repercussions. Good design of safety net instruments has been proposed, and can to some degree reduce the effect of moral hazard, but the problem of interconnected financial systems and increased innovation will continue to persist.

3.13   Review of Nigerian Banking Literature

So far, this chapter started by presenting the rationale for regulating and supervising banking institutions, before focusing on capital regulation because the last two Nigerian banking reforms of 2005 and 2009 centred on recapitalisation. Furthermore, regulatory reactions to the global financial crisis from other countries were discussed as the 2009 banking reforms were also the response of Nigerian banking regulators to the global financial crisis. Progressively, the three main measures of evaluating banking performance (ratio analysis, regression analysis, and frontier analysis) in banking literature were presented. More so, given that this study utilises DEA window analysis and regression analysis, related literature are reviewed.

Therefore, the preceding sections of this chapter set the mood for the review of Nigerian banking studies, which investigated various aspects of banking performance, efficiency, and financial stability.

3.13.1 2005 Nigerian Banking Reforms Literature

This section is centred on the review of Nigerian banking studies that focus on the various dimensions of this research work. Studies that dwell on the regulation and supervision of Nigerian banks, and bank performance studies that adopt related CAMELS bank-specific variables and the DEA window analysis technique are discussed. In addition, the submissions reviewed shows how this study is unique as to the best of the knowledge of the researcher; there is no study that employed the same methodologies in a mixed research study of bank regulation and bank performance in Nigeria.

Aburime (2008) sought to ascertain the determinants of bank profitability in the Nigerian banking sector by empirically employing a sample size of 33 banks over the period of 2000 to 2004. Aburime asserted that the study arrived at three reliable conclusions: capital levels, size of credit portfolio and ownership concentration are significant determinants of bank profitability in Nigeria; size of deposit liabilities, state of IT, productivity of labour, ownership, control-ownership disparity and structural affiliation are not significant determinants of bank profitability in Nigeria; and the relationship between bank risk and profitability is inconclusive. And as such, the study suggested that bank managements should focus on maintaining substantial reserves, improving the quality of credit portfolios, and amplifying ownership concentration levels, whereas regulators should formulate policies and guidelines that foster the suggestions.

Olajide, Asaolu & Jegede (2011) conducted a study to ascertain the impact of financial reforms on the performance of Nigerian banks for the period of 1995 to 2004. In a bid to determine the effects of regulatory policies of recapitalization, interest rate deregulation, and exchange rate reforms, a pooled panel regression analysis was adopted. The results obtained showed mixed effects on the net interest margin and profitability level of Nigerian banks. The study, however, concluded that bank-specific characteristics disclosed significant positive effects on the profitability and efficiency of banks, whereas the industry structure proxies suggested not to have contributed significantly to the profitability and efficiency performance of Nigerian banks.

In an attempt to examine the effect of changes in capital levels of Nigerian banks, Agbeja (2013) employed panel data from thirty-two (32) commercial banks for the period 1992 – 2007. The results obtained indicated that capital base requirement was not effective in

reducing distress in the Nigerian banking industry. Agbeja opined that the minimum capital requirement imposed by regulatory authorities was not sufficient. And as such, he suggested that the CBN further increase the capital base of Nigerian banks to stimulate efficiency.

Regarding the consolidation exercise of the 2005 banking reforms, Ezeoha (2011) sought to ascertain the major determinants of bank assets quality. Using a sample of 19 banks within the period of 2004 to 2008, the study tried to establish how consolidation increases the occurrences of non-performing credits in a fragile banking terrain. The study indicated a decline in asset quality and increased credit crisis in the Nigerian-banking sector within the sampled period were aggravated by the failure of banking institutions to utilise their asset structure to boost their earnings profiles adequately. Additionally, Ezeoha claimed that although excess liquidity and the huge capital bases of Nigerian banks fuelled imprudent lending, the increased level of unsecured credits in the portfolio of banks unexpectedly aided to mitigate the level of non-performing loans within the study sampled period.

Barros & Caporale (2012) examined the Nigerian banking consolidation process for the period 2000 – 2010 using a dynamic GMM panel. The study included the 25 Nigerian banks that emerged after the 2005 recapitalization exercise. Barros & Caporale tested the relationship between banks' cost and the following variables: foreign bank ownership, banks involved in mergers and acquisitions, bank size and consolidation. The results obtained revealed that the Nigerian banking sector benefited from the 2005 consolidation exercise, and in particular foreign ownership, mergers and acquisitions, and bank size decrease costs.

Ikpefan (2012) also conducted a study to ascertain the performance of Nigerian banks post-consolidation. He attempted to find out if the consolidation exercise engineered mergers and acquisitions had any impact on the performance of banks. The empirical results found shareholders' funds not to be significant to ROE in both pre and post-merger periods. The findings equally indicated that shareholders' funds have a statistically insignificant relationship to profit before interest and tax (PBIT). Whereas, bank assets had a positive relationship and are statistically significant to changes in the PBIT of Nigerian banks. In a nutshell, Ikpefan concluded that bank performance improved post-consolidation as the bank assets, bank loans, bank deposits, and value of shareholders' funds increased in the post-merger period.

Yauri, Musa & Kaoje (2012) investigated the impact of capital regulation on bank liquidity and financial distress in the Nigerian banking sector over a ten-year period (1997 – 2006).

The sampled period includes four bank recapitalisations that took place in the Nigerian banking sector "from N50 million to N500 million in 1997; to N1 billion in 2001; to N2 billion in 2002; and to N25 billion in 2005." Employing a simple regression model, correlation analysis and the product moment correlation analysis, they found that a relationship exists between an increase in the minimum capital base of commercial banks and their liquidity and asset quality as liquidity and asset quality tend to improve with recapitalization. Yauri, Musa & Kaoje (2012) however noted that increasing the capital base of banks alone only accounts for a short-term or temporary improvement in the asset quality and liquidity of banks position of banks as the strategy does not have a long-term effect of forestalling bank distress. And as such, they suggested that bank regulators in Nigeria in addition to capital regulation should adopt approaches like the fortification of the corporate governance framework in order to curb financial distress in commercial banks.

Nwankwo (2013) also conducted a study that dwelled on the performance of the Nigerian banks in relation to the banking consolidation exercise that culminated in 2005. The study empirically investigated the effect pre and post bank consolidation performance of Nigerian banks on the Nigerian economy using T-test. The study results suggested that banking consolidation engineered mergers and acquisitions gave rise to improved bank performance regarding asset quality, liquidity, and profitability, which in turn had positive effects on the economy. In essence, the study implied that the banking sector contributed little to economic growth in periods before the banking consolidation reforms, whereas the contribution of Nigerian banks to economic growth increased in the post-banking consolidation period due to improved asset quality, liquidity levels and profitability.

Ezike & Oke (2013) investigated the impact of the adoption of capital adequacy standards on the performance of Nigerian banks. Using a mix of three old generation banks (Pre-SAP) and three new generation (Post-SAP) banks within the period of 2003 to 2007, Ezike & Oke (2013) employed the ordinary least squares (OLS) estimation technique to ascertain the effect of loans and advances, shareholders' funds, total assets and customer deposits, on earnings per share and profit after tax. The results indicated that capital adequacy exerts a major influence on the performance of Nigerian banks. Additionally, they opined that regulatory authorities increased the minimum capital requirement in line with the Basel Accord framework recommendations, and the impact was positive. However, even though the recapitalization of Nigerian banks led to improved performance of Nigerian banks, Ezike & Oke (2013) suggested that regulatory authorities should look beyond capital regulation as the

sole determinant of bank performance. They opined that regulators should also concentrate on efficient and effective bank supervision and risk management.

Olalekan & Adeyinka (2013) sought to ascertain the effect of capital adequacy on the profitability of deposit-taking banks in Nigeria. The study relied on primary data from a 76% of 518 questionnaire responses obtained from bank staff and secondary data from published financial statements of banks for the period of 2006 to 2010. The results from the analysis of the primary data revealed a non-significant relationship between capital adequacy and profitability of banks, whereas the analysis of secondary data indicated a positive and significant relationship. They opined that the results implied that capital adequacy plays a central role in the determination of profitability in the Nigerian banking sector. In furtherance, Olalekan & Adeyinka suggested that adequate capital in deposit taking banks serves to cushion them against losses not covered by current earnings. In addition, they opined that the increased capital levels of Nigerian banks after the 2005 recapitalization reforms also doubles as a confidence booster due to the renewed belief in the ability of banks by depositors, the public and Nigerian regulatory authorities. In conclusion, the study recommended that Nigerian regulatory authorities should ensure that the gains of banking reforms are sustained. This can, therefore, be achieved by taking additional decisive measures aimed at tightening the risk management framework of banking institutions because of its positive effect on bank profitability.

Ikpefan (2013) investigated the effect of capital adequacy on the management and performance of Nigerian commercial banks for the period of 1986 to 2006. The study tried to capture the relationship between bank capital and bank performance empirically. In essence, the study examined how capital adequacy and bank performance have been improved by the recapitalization exercise and the consolidation of the Nigerian banking sector. Using the ordinary least square regression method on a sample of fourteen (14) commercial Nigerian banks, the study indicated that the capital adequacy ratio adopted (shareholders' funds/total assets) which measures the capital adequacy of banks (risk of default) has a negative effect on return on assets (ROA). Similarly, the study showed that the efficiency of management proxied by operating expenses is negatively related to return on capital (ROC). In a nutshell, Ikpefan (2013) suggested that the findings imply that adequate shareholder funds served as a stimulating variable in strengthening the performance of Nigerian banks in addition to heightening the confidence of depositors in the Nigerian financial system.

Zhao and Murinde (2011) developed a three-stage procedure to systematically investigate the interaction among variables that proxy financial reforms, bank production efficiency, bank risk-taking and bank competition. They applied the procedures to reform experience of the Nigerian-banking sector during the period 1993 – 2008. The study period covered both the deregulation and the regulation of the Nigerian banking sector. Based on results obtained through three modelling techniques (data envelopment analysis- DEA, conjectural variations-CV and seemingly unrelated regression- SUR), Zhao & Murinde suggested that deregulation and prudential regulation influence bank risk taking and bank efficiency directly as well as indirectly through the impact on bank competition. More so, their findings showed that deregulation initiatives offer banks the opportunity to price risk as well as diversify business lines, thus promoting both efficiency and the safety of bank's loan portfolio. While the tightening of the minimum capital base (2005 banking consolidation reform) brought about increase in bank risk and bank efficiency. However, the increase in bank risk may offset the increase in bank efficiency. Unlike the impact of deregulation, Zhao & Murinde offered that the impact of tightening the minimum capital base on bank risk taking and bank efficiency appeared to be exclusively associated with its direct impact.

Ozili (2015) empirically investigated the determinants of bank profitability in relation to the Basel capital regime. Using a sample of six Nigerian commercial banks within the period of 2006 to 2013 in two panel data regression models, the study indicated that Basel Capital Regime had no significant effect on bank profitability. Ozili opined that the result is significant because it lends supports to the view that the adoption of the modified Basel Accord in different countries may be for the purpose of meeting other prudential objectives other than for the intended objective of reducing excessive bank risk-taking. Furthermore, Ozili (2015) employed the profitability metrics of ROA and NIM and found that the determinants of bank profitability and its significance depended largely on the employed profitability metric. And in addition, he asserted that bank size and cost efficiency significantly influences ROA, whereas the quality of loan influences bank interest margin. More so, Ozili observed that the capital adequacy ratio of banks is a significant determinant of bank profitability. However, in as much as the study by Ozili makes important contributions to the research of bank profitability in relation to the Basel capital accord, the limited number of sampled banks derails the reliability of the study.

Oladejo (2010) in an exploratory study examined the effect of capital regulation on the performance of Nigerian banks. The study found out that scholars and major players in the

Nigerian banking industry highlighted upsurge in the performance of Nigerian banks in terms of increased liquidity and profitability. However, Oladejo noted that the banking consolidation exercise presented challenges that have been overshadowed by empirical findings that hail the increase in liquidity and profitability. As such he submitted that challenges occasioned by the consolidation reforms were observed in the areas of cultural integration, lax corporate governance structures, and information technology related issues due to the incompatibility of software packages amongst merging banks. Equally, Oladejo opined that low capital base was not the main reason for bank distress prior to the 2005 banking recapitalization exercise.

Dogarawa (2011) employed a content analysis technique to x-ray the implication of the 2005 banking consolidation reforms on the Nigerian economy. He asserted that the Nigerian banking industry experienced boom-and-bust cycle periods that culminated in the banking consolidation reforms. The aim of which was to enable the banking sector play the efficient role of financial intermediation and in so doing help bolster economic growth and development. Conversely, Dogarawa opined that the reforms in the Nigerian banking industry had not achieved the desired objectives. He claimed that either this was because of the poor implementation or improper institutional arrangement or maybe the short span accorded to achieving the elements of the reforms. And as such, Dogarawa suggested that reforms should be backed by adequate legislation in view that they should be designed in line with the uniqueness of the Nigerian economy and the institutional behaviour of banking institutions. Furthermore, Dogarawa in agreement with the submissions of Oladejo (2010) opined that banks faced several challenges as a result of the banking consolidation reforms. The challenges surfaced in the areas of integration as merged banks found it difficult in assimilating disparate cultures, while the synchronisation of information technology processes and the harmonisation of systems and staff proved difficult.

Given the studies reviewed, the empirical studies largely agree on the notion that the 2005 banking reforms in general and the consolidation exercise, in particular, had positive effects on capital adequacy, liquidity and profitability. However, some suggested that improved performance occasioned by the episode of the banking reforms was short-term. On that account suggesting that regulation should transcend capital regulations to have a long-term impact on the performance of banking institutions. Additionally, the theoretical studies reviewed made assertions contrary to the glowing effects of the 2005 reforms made by the empirical studies. They held that the 2005 consolidation reforms presented challenges that

derailed the long-term performance and efficiency of Nigerian banks. In particular, the studies mentioned challenges that emanated from the strive to integrate disparate banking cultures, especially amongst merged banks. In addition, challenges also surfaced in the area of the synchronisation of information technology processes (banking software packages).

Although there seems to be ample research on banking reforms in Nigeria, the studies mostly only address the effect of the 2005 banking reforms, while neglecting the 2009 banking reforms. More so, the studies are either empirical with the adoption of various regression models or theoretical with the employment of literature exploratory analysis and content analysis. Hence, no study has combined an array of techniques to ascertain the effect of banking reforms on the performance of Nigerian banks. To that end, this study fills this gap.

3.13.2 Banking Performance and CAMELS Studies

This section focuses on Nigerian banking studies that utilised bank-specific CAMELS variables to ascertain the performance of Nigerian DMBs. Most of the studies employed some form of multiple regression estimations to ascertain the factors that determine performance.

Onaolapo & Ajala (2013) examined the post-merger performance of the Nigerian banking sector with the intention of determining the effect and extent to which mergers influenced bank performance. Bank performance ratios (ROE, ROA, and NIM) were adopted as dependent variables, while bank specific variables that proxy asset profit, capital structure, operating efficiency, liquidity risk, and credit risk stood in as independent variables. Multiple regression analysis was used to analyse the variables from 15 commercial banks within the period of 2001 – 2010. The results obtained revealed a strong relation between bank performance and merger. Thus, they asserted that the merger of Nigerian banks during the banking consolidation reforms positively influenced bank performance.

Beck, Cull & Jerome (2005) sought to ascertain the effect of privatisation on the performance of Nigerian banks (1990 – 2001). Using an unbalanced panel of 69 banks and based on the empirical regression analysis, which adopted three performance measures (ROE, ROA, and NPL). The results obtained indicated some performance improvements due to privatisation. Elaborately, they found out that banks that were privatised within the 1990 – 2001 performed

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significantly worse than privately owned commercial banks before privatisation, though this gap was effectively reduced by privatisation. However, according to Beck, Cull & Jerome, this slight improvement is notable given the inhospitable macroeconomic and regulatory environment that hindered true financial intermediation during their sample period. In addition, their results also provided evidence that long established banks that predominately relied on retail banking performed significantly more poorly than new wholesale banks that were fixated on fee-based businesses and lending to the government.

Osuagwu (2014) empirically investigated the determinants of bank profitability in relation to bank-specific variables, industry related factors and macroeconomic variables. The dataset consisted of selected banks that hold about 60% of the banking sector's total assets within the period of 1980 – 2010. The results suggested that bank profitability is to a large extent determined by credit risk and bank specific that relate to the internal organisation of banking institutions. In addition, the study opined that exchange rate is a significant determinant of bank profitability as revealed by its impact on return on equity (ROE) and net interest margin (NIM), although it did not have a significant effect on return on assets (ROA) as a measure of profitability. In conclusion, Osuagwu (2014) submitted that internal organisation and managerial effectiveness are significant to the profitability of banks and as such bank management could effectively rely on policies that improve their balance sheet positions without regard to external influences.

Ugwuanyi (2015) in a post-financial crisis study sought to examine the interaction between the regulation of minimum capital requirements in Nigerian banks and the risk-taking behaviour of bank operators. The study regressed bank-level data of thirteen (13) banks for the sampled period of 2009 – 2013. The results obtained showed that increase in the size and capital levels of banks correspondingly lead to increased bank risk taking appetite. The results also suggested that an increase in credit risk leads to increased loan loss provisions. Conversely, Ugwuanyi opined that improved regulation translates to reduced risk taking appetite.

More so, in a bid to position Nigerian banks to compete globally with international banks, Nigerian banks started adopting IFRS in 2010. To find out if improved financial information quality impacted the performance of Nigerian banks, Hassan (2015) investigated firm attributes from the perspective of structure, monitoring, performance elements and the quality of earnings of listed Nigerian banks in pre and post-adoption periods of IFRS. The results

revealed that banking institution attributes in the form of leverage, bank size, profitability, liquidity, and bank growth do have significant effects on earnings quality of listed Nigerian banks after the adoption of IFRS. Whereas, the firm's attributes in the pre-IFRS period showed no significant impact on earnings quality. Hence, the study is of the notion that the adoption of the principles of IFRS should be encouraged to promote effective monitoring of banking institutions.

Babatunde & Alawiye-Adams (2013) used the CAMEL analytical technique to measure Pre-Structural Adjustment Program (SAP) and Post-Structural Adjustment Program (SAP) performance of Nigerian banks (1971 – 2005). The panel data model they used adopted Earnings per Share (EPS), Return on Capital Employed (ROCE) and Return on Equity (ROE) as proxies for bank performance (dependent variables), while interest rate, real financial savings and exchange rates were adopted as proxies for financial sector liberalization (independent variables). Additionally, Babatunde & Alawiye-Adams conducted various diagnostic tests to evaluate the regression models (Breuch-Godfrey Serial Correlation Lagrange Multiplier test, Ramsey Reset Test of specification error, and the cumulative sum tests of parametric stability). The results, especially for the proxies of EPS and ROE, revealed that the effect of financial sector liberalisation on bank performance was not significant enough to transform the nations' economy to the desired level. In sum, the results indicated that Nigerian banks were better off in the Pre-SAP era. As such, Babatunde & Alawiye-Adams most importantly suggested that a precondition for an efficient banking sector in a liberalised financial sector is a stable macroeconomic environment.

In a bid to provide empirical evidence on the effect of credit risk management and capital adequacy on the financial performance of Nigerian banks, Ogboi & Unuafe (2013) employed a fixed effect panel data technique on data from six Nigerian banks for the period of 2004 – 2009. The regression model adopted estimated the relationship between loan loss provisions (LLP), loans and advances (LA), non-performing loans (NPL), capital adequacy (CA) and return on assets (ROA). And the results obtained revealed that sound credit management and capital adequacy have positive effects on the financial performance of Nigerian banks aside loans and advances (LA), which displayed a negative effect on the profitability of banks within the study review period. In essence, Ogboi & Unuafe (2013) opined that effective credit risk management and capital adequacy promote improved bank performance and credit risk is a key predictor of bank performance. In addition, the Ogboi & Unuafe (2013)

concluded that the increased capital base of Nigerian banks scaled down the effect of the global financial crisis on the Nigerian banking sector.

Adeyeye, Fajembola, Olopete & Adedeji (2012) attempted to predict the probability of bank failure in Nigeria by adopting the principal component analysis and the discriminant score model. The results suggested that differences in asset quality, capital adequacy levels, liquidity and profitability are key distinguishing characteristics between failed and healthy banks. On the contrary, the study opined that management quality, economic quality and staff productivity are not significant predictors of financial distress in Nigerian banks, although they might have some sway in repositioning banks that are facing difficulties.

Ajibo (2015) in an exploratory research expressed that recurrent distress and failures in the Nigerian banking industry have shown that the predominant reliance on recapitalization and credit rating statistics by regulators and investors to determine the soundness of institutions is less than adequate. While not dismissing the relevance of capitalization strategy and credit rating data, Ajibo opined that the future of banking regulation in Nigeria should be risk-based regulation. As such, he suggested that risk-based supervision should be made a priority by regulatory agencies in Nigeria, in addition to the adoption of Base II/III accords that lay emphasis on risk regulation and management.

Conclusively, though the studies above examined different dimensions of bank performance none of them employed variables that covered the entire spectrum of CAMELS to review the impact of both the 2005 and 2009 banking reforms. More so, in line with the previous section of this thesis, the focus of most of the studies was the recapitalisation exercises carried out by Nigerian regulators. Additionally, there was no consensus on the factors that influenced bank performance with different studies presenting diverse views on capital adequacy levels, liquidity, management quality, asset quality, and macroeconomic conditions. In like manner, the literature also opined that Nigerian DMBs that depended on government patronage and corporate customers outperformed DMBs that relied on retail and small customers, however recent reforms sought to reduce the reliance of DMBs on government funds. To that end, this study evaluates the performance of Nigerian DMBs in relation to the elements of the last two Nigerian banking reforms. In conjunction to relying on the CAMELS framework to ascertain the determinants of bank performance, this study is different from all other Nigerian banking studies because it also reviews the impact of the global financial crisis. Therefore, this study contributes extensively to banking literature in emerging economies.

3.13.3 Data Envelopment Analysis (DEA) Studies

Several studies in recent times have employed the use of DEA to evaluate bank efficiency and performance world over. However, only a handful of these studies dwell on Nigerian DMBs. This section, therefore, reviews these studies with the view of further highlighting the suitability of the DEA technique in ascertaining banking efficiency and performance.

Eriki & Osagie (2014) used DEA analysis to examine the performance efficiency of nineteen (19) commercial banks in Nigeria for the year 2009. They made use of two inputs (total assets and equity) and two outputs (interest income and gross earnings). The DEA results were based on three performance measures, the constant return to scale (CRS); variable returns to scale (VRS); and scale efficiency (SE). Out of the nineteen (19) banks in the sample, the CRS DEA model showed that only four (4) banks were efficient. Whereas based on the VRS technical efficiency scores, eight (8) banks were found to be efficient, while results revealed eleven (11) inefficient banks. Likewise, an examination of the scale efficiency (SE) of the banks revealed that only four (4) were scale efficient while fifteen (15) were found to be scale inefficient. In summary Eriki & Osagie (2014), found out that the small and medium-sized banks in the Nigerian banking industry were more efficient than megabanks.

Muhammad (2008) utilised the DEA and Malmquist Productivity Index (MPI) to analyse the performance of Nigerian commercial banks over a five (5) year period. Following the intermediation approach, net fixed assets and total deposits were used as input variables, whereas the output variables used were total loans and advances, other earning assets and operating income. The inputs and output variables were used to analyse both the CRS and VRS approaches. And according to Muhammad (2008), the utilisation of the CRS and VRS approach was anchored on the desire to measure bank performance based on changes in efficiency and changes in technology. The study showed that the CRS and the VRS of the banks revealed continuous improvement. More so, the results on the average indicated that the banks consistently improved within the five-year period although the improvement in the third year under review appeared lower than in the other years. In addition, the study compared the performance of Nigerian banks across two ownership structures (state-owned banks and private owned banks). The results indicated that the privately owned banks performed better than the state-owned banks. He pointed out that the efficiency scores of the

privately owned banks were closer to 1 (100) or the best practice frontier. Additionally, to further verify the differences in the efficiency scores of the private and state-owned banks, the study measured the statistical significance of the banks using the one-sample Kolmogorov – Smirnov test. The results indicated that the differences in efficiency scores were statistically significant.

Olugbenga & Olankunle (1998) provide the first evidence on the use of the DEA in the Nigerian banking industry. Their study sought to analyse the performance of Nigerian banks within an 11-year period (1983 – 1993). The sample of 278 banks comprised of commercial and merchant banks. However, the sample contained twenty (20) commercial banks before the Structural Adjustment Programme (SAP) of 1986 and 35 commercial banks afterwards. The input variables used in the study consisted total deposits, interest paid on deposits, total capital and overhead costs, while the outputs variables included gross earnings and earning assets. The results of the average efficiency measures indicated stable efficiency levels among banks in periods leading to the introduction of the 1986 SAP. Progressively, the study suggested that the efficiency levels of the Nigerian banking industry witnessed a major upward surge between 1986 and 1987. Olugbenga and Olankunle opined that the upward surge was most probably due to the effect of the economy-wide deregulation, which affected the entire banking industry. The entire banking industry witnessed a decline in efficiency levels for the five-year period that followed (1987 – 1991). However, the banking industry started showed signs of recovery in periods after 1991.

The study by Ayadi et al., (1998) is another DEA study on Nigerian banks. The study represented an attempt to determine the bank performance and the efficiency of bank management by employing the use of the DEA model. Their study used a sample of ten (10) commercial and Nigerian merchant banks that were listed on the Nigerian Stock Exchange. The inputs used include total deposits, interest paid on deposits, and expenses on personnel and administration. While the output variables consisted of interest income, non-interest income, and total loans. The results of the study revealed that of the ten (10) commercial and merchant banks, only three (3) banks were efficient in 1991. In the same line, two (2) banks were efficient in 1992, and three (3) banks were found to be efficient in 1993. However, the results indicated that there was a decline in efficiency levels and only one bank was efficient. Owing to the results, Ayadi et al., (1998) suggested that bank supervision in the industry was weak and many of the sampled banks should have been identified by Nigerian bank regulators and appropriately liquidated. They, however, recommended that the banking

industry could be sanitised by improving banking supervision and by removing government interference.

Akeem & Moses (2014) empirically analysed commercial banks in the periods of 2002 to 2011 to ascertain efficiency, productivity, and growth. They used a sample of ten (10) randomly selected commercial banks. The three (3) input variables used include deposits, assets and operating expenses, while the four (4) output variables used were loans and advances, interest income, non-interest income, and investment. The results showed that seven (7) of the banks analysed were to some extent efficient and had a consistency in their performance. Over the ten (10) years of their study, the average allocative efficiency score of the sampled banks was found to be 0.896. Additionally, the results meant that the sampled banks did not efficiently maximise their inputs in the magnitudes that would minimise costs. More so, Akeem and Moses opined that the inefficiency in the sampled banks might be due to higher non-interest and administrative expenses, rising levels of interest rates, poor investment strategies, rising competition in the banking industry and the less competitive managerial services offered to bank customers at higher input prices.

Obafemi (2012) used DEA to ascertain the technical efficiency of Nigerian banks. The study made use of sixty-seven (67) commercial and merchant banks in the periods of 1984/1985, 1994/1995, 1999/2000, and 2003/2004. Obafemi claimed that the deregulation of the Nigerian banking industry had a mixed effect on the efficiency of Nigerian banks. He was of the view that the efficiency scores of some banks were continuously on the increase, while some were continuously decreasing, and the third group had inconsistent efficiency scores. Obafemi (2012) was also of the opinion that efficiency scores of privately owned banks were better than those owned by the government. It is worth noting that, the periods covered in this study are before the two (2) Nigerian banking reforms of 2005 and 2009. Thus, Obafemi suggested that based on the technical efficiency scores of the sampled banks, the banking consolidation reforms embarked upon by the CBN was not wrong. He opined that the 2005 banking consolidation reform weeded out inefficient banks from the banking system, thus ensuring that bank resources were better used by banks that are more efficient.

Likewise, Obafemi, Ayodele, & Ebong (2013) in their study employed a two-stage DEA approach to examine technical efficiency in Nigerian commercial and merchant banks. In the first stage DEA model, the study generated efficiency scores, which were regressed against a set of explanatory variables in the second stage. The results they presented were consistent

with those presented by Obafemi (2012) above. Even though they added that market share and liquidity ratio were positively related to bank efficiency and were statistically significant. Capital-labour ratio was found to be negatively correlated to bank efficiency, even though it was significant at 10%. More so, the quality of management, capital adequacy and ownership were found to be positively related to bank efficiency but no significant. Due to been a retrospective study of bank performance and efficiency covering periods before the banking consolidation reforms of 2005. They submitted that the Nigerian banking industry was inefficient before the banking consolidation reform of 2005 and that the 2009 banking reform that aimed to reform bank management practices and corporate governance was a step in the right direction.

Tankoano (2013) compared the efficiency and productivity of Burkina Faso and Nigerian banks around the 2008 global financial crisis. Based on a sample of thirty-three (33) banks, he used the DEA window Analysis and the Malmquist Productivity Index Approach to assess the efficiency and productivity of the banks from 2004 – 2011. A three-year period was selected for the study and the eight-year period allowed for six (6) windows. The study made use of two variable inputs (interest expenses and non-interest expenses) and two output variables (Interest income and non-interest income). Tankoano (2013) suggested that both the Burkina Faso and Nigerian banking industries were affected by the global financial crisis. Although the efficiency of the Burkina Faso Banks improved after the global financial crisis, the Nigerian banks did not witness improvements because of the banking crisis that plagued the Nigerian banking industry in 2009 and 2010. Tankoano additionally opined that foreign banks in both countries performed better than local banks. He also was of the view that based on the results of the DEA CCR and BCC models during and after the global the crisis, the average efficient scores of Nigerian banks were higher than those of Burkina Faso banks.

Finally, a review of the studies in this section indicates the study by Tankoano (2013) is the only study that utilised the DEA window analysis. Moreover, the study by Tankoano is a comparative study of the Burkina Faso and Nigerian banking sectors. Apart from the lack of DEA window analysis studies, the period x-rayed in this study differs from all those reviewed by the studies in this section. More so, these Nigerian studies concentrated on ascertaining the efficiency and performance of Nigerian DMBs and recently the global financial crisis without exploring financial safety nets (bailouts and bridge banking mechanisms). Furthermore, DEA analysis was not utilised to predict banking distress in the Nigerian banking sector. On that account, DEA window analysis results are evaluated to uncover if they could be used to

predict banking distress. In conclusion, this study is particularly more exploratory because it utilises the DEA analysis to evaluate the performance and efficiency of DMBs in relation to the 2005 and 2009 Nigerian banking reforms, the bailout of eight DMBs, and the nationalisation of three DMBs into bridge banks.

3.14   Chapter Conclusion

This chapter discussed and reviewed various facets of literature on banking regulation and supervision, the rationale for regulation, capital regulation/recapitalisation, and banking consolidation. Policy responses and reactions to the global financial crisis were also considered. The chapter also presented literature on financial safety nets with a particular focus on bank bailouts and bridge banking mechanism because they were utilised by Nigerian regulators to prevent the collapse of distressed DMBs. The central objective of both the 2005 and 2009 Nigerian reforms was to promote financial stability, hence the review of banking and financial stability literature. To that end, studies that are related to the methodologies adopted to ascertain the determinants of efficiency, performance, and financial stability were also discussed within this chapter. Evidence showed divergent opinions on the factors that determine bank efficiency, performance, and financial stability, hence the rationale for this study. More so, arguments that show the limitations of banking literature in the areas of interest in relation to the 2005 and 2009 Nigerian banking reforms were also highlighted in the concluding paragraphs of every section of this chapter. To round-up the chapter, Nigerian banking studies were presented with particular focus on the methodologies adopted in this study. The reviewed studies indicate the adoption of mostly one or two methodologies in the evaluation of banking performance. Therefore, this study is highly robust and exploratory as it incorporates DEA window analysis, multiple regression analysis and content analysis to examine the Nigerian banking sector from 2000 – 2013.

Chapter Four: Research Methodology

4.1   Introduction

Any research should adopt the appropriate guidelines and procedures to be able to achieve the desired outcome. To this end, this chapter dwells on the systematic framework that this research followed in order to achieve the aims and objectives of the study.

This study examines the effects of banking reforms on the performance, efficiency, and stability of Nigerian deposit money banks. Interview responses, in addition to annual financial stability reports and annual reports from the CBN and NDIC, are used to evaluate the activities of bank managements and regulatory authorities. The performance and efficiency of Nigerian banks are gauged using the DEA window analysis technique based on selected input and output variables. While multiple regression analysis is employed to ascertain the effects of capital adequacy, asset quality, management quality, earning ability, liquidity, sensitivity to market risk, bank size and GDP on bank efficiency, bank performance, and banking stability. Thus the focus of this chapter will be on the description of the processes adopted to answer the research questions in order to achieve the aims and objectives of the study.

This chapter focuses on the research methodology and the procedures employed in conducting this study. Research methodology is the exposition of the guiding principles that comprise of the systematic data collection and interpretation of data, geared towards uncovering logical relationships that lead to valid conclusions (Ghauri & Gronhaug, 2010; Saunders, Lewis, & Thornhill, 2016). With a view to give direction to this study, this research methodology chapter is a sequential presentation of the array of choices, paradigms, data collection methods, techniques of data analysis and the entire process navigated by the researcher in order to provide answers to the research questions and realise the aims and objectives of the study.

In sum, this chapter dwells on the research framework adopted to achieve the aims and objectives of this study. The research philosophy, research approach, research strategy, methods of data collection, techniques used for data analysis and testing, the validity and

reliability of the study and constraints that were encountered in solving the research problems.

In order to ensure a sequential flow of the discussion of the procedures employed in conducting this research, the scope of the study is presented to lay the foundation for further deliberations. The scope of the study highlights the time frame of the study and the institutions involved.

4.2 Scope of Study

The Nigerian banking sector is regulated and supervised by the Central Bank of Nigeria (CBN) and the Nigerian Deposit Insurance Corporation (NDIC). The CBN and NDIC are the two main regulatory authorities in Nigeria, and they are saddled with the task of safeguarding the banking industry and ensuring the efficiency and soundness of banking institutions. The CBN and NDIC oversee the activities of commercial banks, merchant banks, micro-finance banks and mortgage banks operating in Nigeria. Nonetheless, only banks termed as Deposit Money Banks (DMBs) by the Nigerian banking regulatory authorities are examined in this study. Deposit money banks in the Nigerian banking sector include only commercial and merchant banks. Additionally, some commercial banks either acquired or merged with the merchant banks, and for that reason, all the banks that survived the banking consolidation reforms of 2005 operate under commercial banking licences. In broad terms, this study examines the impact of the activities of the CBN and NDIC on the efficiency and performance of DMBs in Nigeria. Hence, the institutions of focus are the CBN, NDIC and Nigerian Deposit Money Banks.

The efficiency, performance, and stability of Nigerian DMBs are examined over a period of fourteen years (2000 – 2013). This period is chosen by virtue of the events that transpired in the Nigerian banking industry and the world. In view of the Nigerian banking sector, the banking system went through two banking reforms that changed the landscape of the industry. The Nigerian banking sector went through the 2005 and 2009 banking reforms within a period of five years. More so, Nigerian regulators bailed-out eight DMBs in 2009, and adopted the bridge banking model to resolve three (3) distressed banks in 2011. While in

general, the global financial crisis that affected global economies and financial institutions started in the second half of 2007.

In conjunction with the above, the periods before the 2005 banking reforms (i.e. 2000 – 2004) are examined in order to present a robust picture of the Nigerian banking sector before the consolidation exercise that trimmed down the number of banking institutions. In like manner, the period 2010 – 2013 is included in the study to evaluate how the banks fared after the global financial crisis and the 2009 banking reforms.

4.3   Research Philosophy

One significant and initial aspect of the research process is the research philosophy. Research philosophy relates to the development of knowledge and the nature of that knowledge in relation to research (Saunders and Lewis, 2012). The philosophical position of the researcher influences the way in which the entire research process is conducted. Thus the research philosophy highlights the researcher's perspective of the study, the variables adopted, the relationships uncovered, influencing factors, and the desired outcome. The philosophical choice of the researcher also defends the position taken in relation to the alternatives that could have been adopted.

It is important to examine the philosophical issues in research because it enables the researcher to evaluate research critically. A review of the philosophy adopted is essential to discern the fundamental and conceivable contentious, assumptions upon which research reports are established even when these are not explicit, and therefore to be able to examine the aptness of the methods that have been utilized and the validity of the conclusions reached (Walliman, 2009). Research philosophy covers the entire research and includes distinct and significant assumptions concerning the study. It expresses the philosophical stand of the researcher in relation to the nature of reality, what is acceptable knowledge and values in research. The research philosophy also dwells on the research strategy and the methods the researcher adopts. Nonetheless, before individual philosophical standpoints are presented, this study aligns with Saunders et al (2009) who opines that no research is superior in relation to the other. They hold that it is, however, crucial to select the most appropriate philosophy or

philosophies that will assist in providing a valid conclusion to the research aims and objectives.

According to Saunders and Lewis (2012), the main strands of research philosophy are positivism, realism, interpretivism, and pragmatism.

4.3.1 Positivism

Positivism or the positivist approach is an epistemological position that supports the application of natural scientific methods to the study of social sciences (Bryman & Bell, 2011). The positivist approach entails collecting data around an observable reality and searching for regularities and casual relationships in data to build law-like generalizations like those produced by scientists (Myers, 2013). Positivist research generally assumes that reality is objectively given and can be described by measurable properties, which are independent of the observer (researcher) and his or her instruments. The theory of knowledge according to positivists excludes evidence such as emotions, personal insight and opinion (Henning, Rensburg & Smit, 2004). Simply put, positivism aims to describe an experience or test a theory through observation and measurement (O'Leary, 2004). The Positivist philosophy accepts that the growth of knowledge is to all intents and purposes a cumulative process in which new insight is added to the existing stock of knowledge. Positivist research is most commonly associated with quantitative methods of data collection and analysis (Mackenzie & Knipe, 2006). However, positivists hold that observation through the senses must also be tested through the senses.

4.3.2 Realism

Realism as a research philosophy holds that objects exist independently of our knowledge of their existence. Just like positivism, realism relates to scientific inquiry (Saunders and Lewis, 2012). Scientific experiments are conducted specifically considering the open character of the world where events are subject to several casual variations. In natural sciences, the idea of experiments is to create closed systems by creating the appropriate intrinsic and extrinsic conditions in order that regular sequences of events may occur in the empirical domain.

Realism lays emphasis on experimentation just like positivism, even though it disagrees with the possibility of generalizing experimental findings because of the nature of reality that is stratified and dynamic consisting of underlying contingent structures (Bechara & Van de Ven, 2007). Positivism relies on the regular sequence of events generated under controlled experimental conditions contingent upon the Humean conception of causality. While realism, on the other hand, regards experiments in the light of providing ideal conditions for the study of mechanisms (Pawson & Tilley, 1997; Tsang, 2014). Realism as a philosophy offers a methodology that neither pursues the particular nor the general, instead it measures casual relationships in the core of the object of study, in accordance with processes or structure and mechanisms. These powers are activated in accordance with the contingent relations or contextual conditions that are peculiar to the object. The advantage of this philosophical view is its ability to engage with causality and complexity in context (Smyth & Morris, 2007).

4.3.3 Interpretivism

Interpretivism aims at understanding the world of human experience and it is the view that reality is socially constructed (Cohen & Manion, 1994, Mertens, 2005). It understands phenomena through the context that people assign to these phenomena. (Trauth, 2001). Interpretivists assume that individuals have inner capabilities that stimulate agency. They also believe that cause and effect are mutually interdependent and that achieving complete objectivity is difficult. Interpretivism holds that an understanding of individual circumstances is ideal and should be held over predictive generalizations. Interpretivists opine that the world is constituted of multifaceted realities that are best studied from the perspective of different individuals. They are also of the view that inquiry is always swayed by the researcher's values (Naidoo, 2011). In sum, the interpretivist approach relies on the views of the participants in a study. Consequently, it is the presumption that the background and experiences of participants' impact on the research. Interpretivists inductively develop theories or patterns of meaning throughout the research process. This is a deviation from the positivist approach which begins with a theory. Interpretivism is largely subject to qualitative methods of data collection and analysis; however, it sometimes combines both qualitative and quantitative methods (Mackenzie & Knipe, 2006).

4.3.4 Pragmatism

Each philosophy of science above presents its unique problem (ontology), the means of knowing the problem (epistemology), the methods for explaining or understanding the problem, and the model for evaluating solutions. Consequent on these different outcomes, the dilemma exists on which direction researchers should pursue. An alternative is the adoption of a philosophy that is not committed to any particular paradigm or reality but at the same time relies on all. The **pragmatic paradigm** or philosophy focuses on using common or convergent outcomes from each perspective (Bechara & Van de Ven, 2015). Pragmatists engage in triangulation which refers to the use of multiple data sources, theories and methods. They focus on the "what" and "how" of the research problem (Creswell, 2009; Mackenzie & Knipe, 2006). Early Pragmatists were of the notion that social inquiry is not only likely to present the truth about real world situations by relying on a single scientific method (Mertens, 2005). Pragmatism hinges on the procedure for establishing the convergent and discriminant validity of measures (Bechara & Van de Ven, 2015). The triangulation of philosophies or paradigms assumes that the bias inherent in any particular method, theory, or data source will be eliminated, or minimized, by relying on the convergent information from the diverse methods and approaches (Mathison, 1988). Thus, pragmatism is perceived as the approach that offers the underlying philosophical framework for research combining both qualitative and quantitative methods – mixed methods (Mackenzie & Knipe, 2006; Somekh & Lewin, 2005). However, although mixed methods can be used in any paradigm, "the research problem" is cardinal in the pragmatic paradigm and it applies all approaches to understanding the problem (Creswell & Plano-Clerk, 2011). Most importantly, pragmatist employs the use of multiple data collection methods to best answer the research question. The pragmatic approach allows the collection of qualitative and quantitative data from various sources with a singular focus on the practical implications of the research. In sum, it emphasizes the importance of steering research that best addresses the research problem (Creswell, 2015).

Consequently, for the reason that this study does not limit itself to any particular paradigm and it resorts to the triangulation of data collection methods and analysis, it can be discerned that this study leans towards the pragmatic paradigm. This study adopts pragmatism because of its flexibility and its ability to allow the triangulation of philosophies, data collection sources, and methods of analysis. Pragmatism is problem-centred and its application ensures that data obtained and methods of data analysis are specifically chosen with the singular

purpose of providing answers to the research questions in order to achieve the aims and objectives of the study.

4.4   Research Approach

Research approach can be divided into two main groups: deductive and inductive (Saunders et al, 2012). There also exists a third research approach called abduction, which sways between deduction and induction (Saunders et al, 2012; Bryman & Bell, 2015).

The deductive approach is known as theory testing, where the researcher develops a theory or hypothesis, and designs a research strategy to test the formulated theory (Saunders et al, 2012). According to Ang (2014), the deduction approach is theoretically driven. It starts with the establishment of relationships between concepts with the aid of theories. These theories are then narrowed down to unambiguous hypotheses. Consecutively, the generated hypotheses are then tested using data. The test will reveal if the designed hypotheses are supported or not, before conclusions and implications are derived from the obtained results. The simple diagram below illustrates the flow of the deductive approach.

Figure 4.1: Deductive Approach

Theory	Hypotheses	Observations

On the other hand, the inductive approach is known as a building procedure, where data is collected and analyzed to understand the research phenomenon in an attempt to develop a theory (Saunders et al, 2012). The inductive approach is grounded on observations that seek to explain what was observed. Inductive researchers make observations and attempt to uncover patterns from these observations. Propositions and hypotheses are formulated to aid in explaining what was observed. And in line with the formulated hypotheses, conclusions, and a theoretical framework are established. More so, the inductive approach attempts to make broader conclusions based only on a part of the evidence. The strength of the

generalizations that emerge from indicative reasoning is dependent on the extent of coverage of the observations and the number of observations. To be concise, the validity of the inductive approach is fortified as the number, scope, and diversity of observations increase (Ang, 2014). The diagram below is a simple illustration of the inductive approach.

Figure 4.2: Inductive Approach

Observations	Hypotheses	Theory
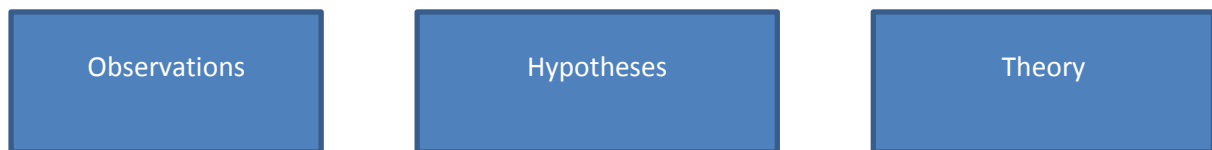
However, it is essential to note that even though the deductive and inductive approaches are mutually exclusive, they are often used simultaneously (abduction). Abduction has grown in popularity in business research and in other social scientific disciples. Abduction, just like the deductive and inductive approaches is used to make logical inferences and build theories. It is proposed as a way of navigating through the limitations associated with the deductive and inductive approaches. In particular, the deductive approach is subject to a strict logic of theory-testing and the fabrication of hypotheses; however, problems emerge because the path of selecting theories to be tested is usually obscure. Also, the shortcoming of the inductive approach stems from the reproach that no amount of empirical data will certainly enable theory-building. Hence, the abductive approach is proposed to overcome the limitations of deduction and induction (Bryman & Bell, 2015).

Abduction starts with a dilemma or surprise and then seeks to explain it. Issues or dilemmas may arise when researchers run into empirical phenomena which existing theory cannot account for. Abduction, therefore, seeks to identify the conditions that would make the phenomenon less of a mystery, while also turning the surprising facts into a matter of course. This process entails going back and forth with the engagement of the social world as an empirical source for theoretical ideas, as well as literature, in a bid to promote analytic shuttling. In brief, the abduction approach involves selecting the most appropriate explanation from an array of competing explanations or interpretations of obtained data (Mantere & Ketokivi, 2013; Bryman & Bell, 2015).

According to Fann (1970), Charles Pierce (1839-1914) who is viewed as the father of abduction was of the opinion that abduction is based on the pragmatist philosophy. More so, the pragmatic approach relies on abductive reasoning that seesaws between induction and deduction by converting observations into theories and subsequently assessing the theories through action (Onwuegbuzie, Johnson, & Collins, 2011).

Consequent on the adoption of the pragmatic philosophy in this study, this study also seesaws between deduction and induction in order to achieve the aims and objectives of the study. To be specific, the evaluation of the performance of DMBs with particular reference to the banking reforms of 2005 and 2009 is deduction. While seeking to understand what happened in the Nigerian banking sector during the 2005 and 2009 banking reforms, in order to make recommendations that enhance bank performance and efficiency and promote financial stability in the Nigerian banking sector is induction. In effect, this study incorporates deduction and induction, and as such it adopts the abduction approach.

4.5   Research Strategy

In line with the combination of the deductive and inductive research approaches, this study adopts a mixed method strategy. That is the triangulation of qualitative and quantitative methods of data collection and analysis. The mixed method strategy essentially entails the incorporation of qualitative and quantitative methods of investigation in a single study (Ang, 2014; Bryman & Bell, 2015). Additionally, a mixed method research strategy involves the collation of both numeric and text information so that the final database embodies both quantitative and qualitative information (Creswell, 2015). Another definition advanced by Johnson et al (2007) holds that mixed methods research combines the elements of quantitative and qualitative research approaches (for instance, use of quantitative and qualitative viewpoints, data collection, analysis, inference techniques) for the all-expansive purpose of breadth and depth of understanding and authentication (Johnson et al , 2007; Carayon et al, 2015).

Qualitative data and analysis involve the description of phenomena and text, while quantitative data involves numbers and categories, where statistical methods are employed to describe phenomena. Even though mixed methods research implies the triangulation of

qualitative and quantitative methods of data collection and analysis, both methods can be exclusively employed (Howe, 2012).

Several scholars have made submissions to the advantages of mixed methods research. Denzin (1978) opined that the triangulation of the methods leads to the elimination of bias inherent in any particular data source and any innate bias will be cancelled out when various data sources and methods are utilized. Progressively, Jick (1979) was of the view that triangulation allows researchers to be more confident of their finding and results; encourages the development of creative ways of gathering data; leads to thicker and richer data; leads to integration or unification of theories; may lead to the unearthing of contradictions; and it may serve as a litmus test for opposing theories. More so, Greene, Caracelli, & Graham (1989) offered five rationales: (a) triangulation – seeking convergence and confirmation of different results from various methods studying the same phenomenon; (b) complementarity – in search of elaboration, enhancement, illustration, and clarification of the results from one method to help inform the other method; (c) development – utilizing the findings from one method to help inform the other method; (d) initiation – developing paradoxes and contradictions that result in the reframing of the research question; (e) expansion – seeking to expand the scope and range of inquiry by using various methods for different inquiry components.

The above highlight the advantages of the mixed research method and they reinforce the choice of the researcher to adopt it for this study. However, even though mixed methods research is full of numerous advantages because of its complementary nature, it also has some disadvantages. For one, conducting mixed methods research is not easy (Creswell, 2015). It requires a lot more work and financial resources and tends to take additional time. The combination of strategies extends the time frame for research design, data collection, and analysis (Denscombe, 2010). More so, the researcher needs to develop a broader array of skills that spans both qualitative and quantitative research. This increases the demands on the researcher and advances the possibility of missing the mark on both fronts (Denscombe, 2010; Cameron & Price, 2010). Furthermore, the underlying philosophy of mixed methods research "pragmatism" is vulnerable to misinterpretation. The common sense of the word "pragmatic" suggests expediency and a certain lack of principles underlying a course of action. Hence, the possibility exists that mixed methods research is often times mistaken to the extent it is perceived as "anything goes". Moreover, results from different methods might not corroborate each other, which may force the researcher to extend the study in order to

unravel reasons for this (Denscombe, 2010). Notwithstanding the disadvantages of the mixed methods research, the advantages of adopting both qualitative and quantitative methods downplay the disadvantages of adopting both methods.

Conversely, Denscombe (2014) articulated the purpose of mixed methods research which downplays its disadvantages and is also the reason for the employment of the mixed method research in this study. Denscombe (2014) reviewed several mixed methods research and suggested that:

- Some researchers employ the use of the mixed method strategy to improve the accuracy of data;
- Mixed methods is employed to produce a more thorough representation by combining information from complementary types and sources of data;
- Mixed methods are also utilized as a means of circumventing biases intrinsic to single-method strategies, as a way of compensating for strengths and weaknesses associated with individual methods.
- Mixed methods are used as a way of developing the analysis process and building on a preliminary finding by using different types of data or methods.

Therefore, consequent on the above and in addition to the views expressed by Myers (2013) and Saunders et al (2012), the triangulation of qualitative and quantitative methods is adopted in this study to overcome the weaknesses associated with using one method, and provide the scope for richer data collection, analysis and interpretation.

Finally, in view of the peculiarity of this study, the mixed methods approach is employed to obtain primary information from bank regulators and bank executives that complement the financial figures of deposit money banks (DMBs). Even though the financial figures utilized in this study cover the periods Nigerian DMBs went through the 2005 and 2009 banking reforms and the global financial crisis periods, interview responses were obtained from professionals who are players in the Nigerian banking sector. Bank regulators were involved in initiating the reforms and supervising DMBs through the global financial crisis, while bank executives implemented the reforms and initiated internal control practices to mitigate risk and manage the effects of the global financial crisis on individual DMBs. The use of statistical models in this study eliminates the bias usually ascribed to qualitative interview data because of its great level of human involvement. Therefore, the use of qualitative and

quantitative techniques in this study ensures that they compensate for the strengths and weaknesses of the individual techniques. Lastly, the use of content analysis, DEA window analysis, and regression analysis in a single study is exploratory as this study has so far been unable to find another study based on the Nigerian banking sector that utilized the same techniques.

4.6   Methods of Data Collection

The qualitative and quantitative data utilized in this study were obtained from a wide variety of sources. Qualitative data was obtained from primary and secondary sources, while quantitative data was acquired from a secondary database.

4.6.1   Primary Data (Interview Process)

Saunders and Lewis (2012) describe primary data as data collected explicitly for the research project being undertaken. To that effect, primary data was obtained through face-to-face interviews and Skype interviews. Interviews are referred to as 'conversation with purpose' (Cameron & Price, 2009). An interview is a two-way conversation initiated by an interviewer to obtain information from an interviewee or participant (Blumberg, Cooper & Schindler, 2014). The differences in the roles of the interviewer and interviewee or participant are pronounced. Ordinarily, the interviewer controls the topics and patterns of discussion. The interview technique allows the researcher or interviewer to steer conversations in directions suggested by responses, in order to prompt and probe, explore meanings and in the long run generate rich qualitative information (Blumberg, Cooper & Schindler, 2014; Cameron & Price, 2009; Kvale & Brinkmann, 2009).

In relation to this study, the interview technique was employed in order to obtain up-to-date information from participants as quantitative data mostly offers only historical data. Interviews offer flexibility, informality, and interactivity. The flexibility of the technique ensured that the questions asked were designed to meet and match the researchers' specifications. This study also adopted this method in a bid to obtain in-depth information

bordering on regulation and supervision, in addition to the perception of experienced players in the Nigerian banking sector.

While secondary data and the quantitative analysis was able to capture financial data from almost all the banks that existed in the Nigerian banking industry from 2000 – 2013, the interview technique was only able to solicit responses from the surviving deposit money banks and the two main regulatory agencies in the Nigerian banking industry. Although it was the desire of the researcher to obtain responses from a total of twenty-three individuals, one from each deposit money bank and one each from the regulatory authorities, only a total of seventeen individuals were interviewed. That is, fifteen senior bank managers from fifteen different DMBs were interviewed, in addition to the director of banking supervision from the CBN and a senior research officer from NDIC. It is, however, worth noting that the response from the director of banking supervision was received as a PDF attachment via email, as access for a face-to-face interview was not sanctioned.

However, before data was collected, approval was sought from the University of Salford Research Ethics Committee. Ethical approval (Appendix 3) was obtained on May 14, 2014, to embark on field study. Data collection involved face-to-face interviews; hence, the researcher had to travel to Nigeria in June 2014. The Interviewer (Researcher) spent a total of three months (July – September) in Nigeria. In order to gain access to the appropriate personnel and obtain relevant information, official letters were delivered by the researcher to the head offices of all the organizations involved in the study. Follow-up telephone calls were also made and those that responded were interviewed. The entire month of July 2014 was spent on the delivery of interview access letters and making the follow-up calls. The entire process was cumbersome as some phone calls to gain access were not returned and some DMBs did not grant the required access. A total of 12 interview responses were obtained by the end of September 2014. 10 interviews were obtained from the DMBs and 2 from the banking regulators. Apart from the written response to the interview questions from the CBN directorate of banking supervision, the other 11 interviews were conducted face-to-face.

Furthermore, the 12 interviews collected during the fieldwork in Nigeria were inadequate to draw conclusions. On this account, the researcher relied on Skye calls to increase the number of interview participants. These additional 5 interviews were conducted within the span of 6 months (January – June 2015). To that end, a total of 17 interviews were conducted as at the end of June 2015. Persistent calls to further increase the number of interview responses did

not receive favourable feedback. Hence, the content analysis of qualitative data relied on the interview responses of 15 senior bank managers and 2 senior bank regulators. A sample of the official letter presented to gain access in shown in appendix (Appendix 4).

Additionally, the interview questions were largely "open-ended" in order to generate in-depth responses that explore various perspectives. Though the questions asked were structured to meet the needs of the research, follow-up questions in the bid to obtain clarifications were also posed. The participants (interviewees) from the CBN and NDIC answered similar questions (Appendix 1), while participants from the surviving DMBs responded to different questions (Appendix 2). The questions asked are unique to the functions of the different institutions in order to obtain valid and reliable responses.

Despite the various advantages ascribed to the use of the interview technique, it is also weighed down by a couple of disadvantages. For one, human beings possess different perspectives even when they experience the same phenomenon. Hence, the accuracy of interview responses is dependent on the knowledge and experience of the participant; the participant's willingness to divulge vital information; and the ability of the participant to understand the questions asked and articulate responses. In sum, interviews are susceptible to influence and bias.

Additionally, the interview method is not a simple method to undertake. For instance, not all bank staff are right participants as their work schedule does not entail them to understand the interaction of banks with regulatory authorities. In like manner, not all the staff of CBN and NDIC are suitable to respond to the interview questions meant for bank regulators as they do not belong to the banking regulation and supervision departments of the regulatory authorities and their duties and responsibilities does not afford the opportunity to understand the interactions between regulators and banks. As such, only senior bank managers that were working in the banking industry during the two Nigerian banking reforms were interviewed. The positions they held ensured that they have risk management experience in addition to the workings of the CBN and NDIC. In relation to the participants from the regulatory authorities, responses were sought from the highest-ranking regulatory officers. The Director of Banking provided responses to the interview questions, while the NDIC mandated a Senior Research Officer with vast experience to respond to the interview questions. To sum up, the researcher ensured in this study that the appropriate participants responded to the interview questions.

Cameron & Price (2009) and Kvale & Brinkmann (2009) opined that the interview technique is time-consuming when compared to other techniques. It entails obtaining access, fixing appointments for the interview, the interview session, recording, transcribing, interpretation and analysis. These processes are cumbersome and time-consuming. Consequent on the cumbersome and time-consuming nature of interviews, small sample sizes are usually used. A large sample size is generally preferred but this is not always feasible with interviews. In relation to this study, only seventeen interviews were conducted but the interview submissions were detailed.

Even though the number of interview responses was not large, its effect is downplayed in this study by the employment of various secondary data sources. The reliability and validity of the data sources employed to augment the small sample size of interview responses are discussed below. However, the study set out to obtain interview responses from twenty-three participants and achieved a 73.9% response rate. Additional, the triangulation of data sources and techniques of analysis make amends for perceived limitations.

4.6.2 Secondary Data

Secondary data forms an integral part of data used for this research. Banking regulations are laws and guidelines that are found in circulars, reports, gazettes, and organizational documents. Therefore, in order to achieve the aims and objectives of this study, data on the two banking reforms, interventions by regulatory authorities, sanctions meted out by regulatory authorities and information on major events that affected the banking system were obtained from the financial stability reports of the CBN and the annual reports of the NDIC. More so, annual regulatory indices were also obtained from the CBN and NDIC reports. Circulars from the CBN and NDIC to commercial banks, in addition to the websites of the regulatory agencies, were also utilized as sources of up-to-date secondary data.

Still more, secondary data is essential to this study because of the richness of information which is well beyond the resources of an individual researcher. The financial stability reports of the CBN and the annual reports of the NDIC are produced annually by the research departments of both regulatory authorities. The information contained in the publications includes submission made by banking institutions and those obtained through on-site bank

visits and surveillance. Additionally, the information obtained from the various reports are vital pieces of information as third party users like foreign investors and global regulatory agencies like BCBS, World Bank, and IMF rely on them. Moreover, secondary data is employed in this study to validate and complement interview responses (primary data). The secondary data used in this study adds depth to the interview responses and broadens the database in order to allow for wider articulation and generalization of findings (Adams, Khan, Raeside, White, 2007).

Likewise, even though further information is presented on the variables used for the DEA Window analysis and multiple regression analysis, it is worth noting where they are acquired. The input and output variables used to calculate efficiency scores using the DEA window analysis technique, the bank-specific CAMELS ratios, and Z-Score adopted for various regression models were obtained from the BANKSCOPE Database. While the consumer price index (inflation) used to calculate bank size and GDP growth are obtained from the National Bureau of Statistics. Further discussions on the variables are presented in subsequent sections of this chapter.

Conversely, disadvantages of secondary data exist which studies that rely on must consider. Secondary data are historical in nature and may not be relevant to contemporary issues. In relation to this limitation, most financial figures and indices are mostly historical in nature. However, this study goes back in time to examine the performance of Nigerian DMBs, so that forward-looking recommendations can be made. More so, an understanding of history ensures past mistakes are not repeated.

Similarly, secondary data are sometimes manipulated from their original source and manipulated data are plagued by errors and inconsistencies which result in false findings and conclusions. Likewise, secondary data can spring from unreliable sources which did not pass through rigorous scientific sources. In order to ensure that the secondary data employed in this study are not manipulated, only reliable databases (BANKSCOPE) and government prepared documents are used.

So far, the chosen research philosophy, adopted research approach, research strategy, and the sources of data used to achieve the aims and objectives of this study have been discussed. They all form the background to the techniques employed to analyze obtained data. Therefore, subsequent sections of this chapter will dwell on the in-depth review of the analysis techniques and the variables used.

4.7　Data Analysis Techniques

As mentioned in earlier sections of this chapter, this study triangulates qualitative and quantitative methods. As such, various techniques are utilized for the presentation and analysis of data. Three techniques are employed for the presentation and analysis of data. Content analysis is adopted for the analysis of interview responses and other regulatory documents. DEA Window analysis is used for the evaluation of bank performance and efficiency. Whereas, multiple regression analysis is employed to examine the relationship between capital adequacy, asset quality, management quality, earning capacity, liquidity, sensitivity to risk, bank size, and GDP on bank efficiency, bank performance, and financial stability. Thus, the content analysis process used to analyze interview responses and regulatory documents is first presented.

4.7.1　Content Analysis

Content analysis is utilized to evaluate data obtained from interview responses, CBN financial stability reports, NDIC annual reports, circulars, banking supervision reports and implementation guidelines. In sum, content analysis is used for the analysis of qualitative data in this study.

Byrman and Bell (2015) view content analysis as an approach to the analysis of documents and texts that try to quantify content in terms of prearranged categories and in a systematic and replicable manner. In like manner, content analysis is viewed as a research methodology which analyses textual data for patterns and structures, drawing out key features to which researchers base their attention, develop categories, and incorporate them into perceptible constructs in order to derive text meaning (Gray & Densten, 1998; Shoemaker & Reese, 1996; Vitouladiti, 2014).

4.7.1.1 Justification for the Adoption of Content Analysis

Several advantages, which have been ascribed to content analysis, facilitated its adoption in this study.

Foremost, content analysis provides an avenue for a replicable methodology that can access deep individual and collective structures such as values, intentions, attitudes, and cognitions. Additionally, the flexibility of content analysis magnifies the desire for its adoption.

Furthermore, the strengths of content analysis (Vitouladiti, 2014), which justifies its utilization in this study, are presented below:

- Content analysis can be applied to examine written documents as well as pictures, videos, and situations.
- It is widely used and easily understood.
- It can help in interpreting trends in individuals or groups.
- It is not an expensive method and it can be easily repeated in the event problems arise.
- It is not obstructive and does not necessarily entail contact with people.
- It is convenient for analyzing archival material.
- Establishing reliability is simple and straightforward.
- Content analysis, when compared to other research methods, scores highest with regard to ease of replication. Materials used can be made available for others to validate.

Conversely, content analysis also has some weaknesses (Vitouladiti, 2014):

- It is purely a descriptive methodology. Thus, it describes what there is, but may not disclose cause and effect. In other words, content analysis might not reveal the underlying motives for the observed pattern.
- Most importantly, the analysis is limited by the availability and authenticity of data.

This study acknowledges that content analysis has some inherent weaknesses; however, steps have been taken to downplay these shortcomings. Owing to the notion that content analysis is largely descriptive and it might not reveal cause and effect, this study obtained data from various sources that triangulate responses from different sets of participants. For instance, participants from regulatory authorities commented on the performance of banks, while

senior bank managers responded to inquiries bordering on the role of regulators in promoting bank performance and financial stability. Likewise, this study was not limited by the availability of data, as information from several sources were utilized. Interview responses were solicited from experienced individuals from reputable institutions and the financial stability reports and annual reports are official government sanctioned documents from the CBN and NDIC.

Consequent on the advantages of content analysis and the various sources of data employed to minimize the weaknesses of the technique, quotations have been used to buttress the views of interview participants. In addition, the broad concepts of banking reforms, risk management, financial safety nets, and financial stability/soundness are x-rayed. Progressively, the key terms and concepts under the above mentioned broad concepts that guide the qualitative analysis of data include: banking reforms, recapitalization, consolidation, risk management credit risk, non-performing loans/credits, credit committee, loan approval, loan approval officers, market risk, interest rate, liquidity, liquidity risk, liquidity ratio, excess liquidity, operational risk, fraud and forgeries, composite risk rating, financial safety nets, deposit insurance, deposit insurance contributions, deposit insurance scheme, bank bailouts, bridge banking, purchase and assumption technique, capital injections, and financial Stability.

It is worth noting that the content analysis used in this study reviewed all the information brought to the attention of the researcher in the course of the interview. However, the terms mentioned above guided the researcher in analyzing interview responses and served as launch pads for the probing of CBN financial stability reports and NDIC annual reports. Progressively, the sections below dwell on the two quantitative techniques employed to complement the qualitative content analysis of interview responses.

Additionally, the justification for adopting of two quantitative techniques (DEA window analysis and multiple regression analysis) would have been appropriate at this junction. However, the position of this thesis on the rationale behind the adoption of both techniques is better presented after both techniques have been individually discussed.

4.7.2 Data Envelopment Analysis (DEA)

The Seminal work of Charnes, Cooper, & Rhodes (1978) followed the works of Farrell (1957) and brought the DEA model to prominence. DEA is a non-parametric linear approach, which is capable of employing the use of multiple inputs and multiple outputs. It is a 'data oriented' methodology for evaluating the performance of Decision Making Units (DMUs). Avkiran (2011) refers to DEA as a non-parametric linear programming technique used to develop empirical production frontiers and to assess the performance of Decision Making Units (DMUs). For the sake of this study, banks are the Decision Making Units (Farrell, 1957; Charnes et al., 1978).

In the last three decades, the application of DEA to evaluate the performance of various entities and activities in different countries has become commonplace. For the reason that DEA requires little assumptions, it has opened up possibilities for use in instances that have previously appeared resistant to other approaches because of the multifarious nature of the relations between the numerous inputs and outputs involved in DMUs. The DEA approach has been utilized to provide insight into activities that have been examined by other methods. For instance, DEA is used in studies for benchmarking inefficient organizations against efficient ones. Since the seminal work of Charnes et al (1978), academics and researchers have recognised that the DEA is an excellent methodology for modelling organizational activities and operations for performance evaluation (Charnes et al., 1978; Cooper, Seiford, & Zhu, 2011; Cooper, Seiford, Tone, & Zhu, 2007).

Charnes et al (1978) referred to DEA as a mathematical programming model that is applied to observational data to provide novel ways of obtaining empirical estimates of relationship. The DEA methodology is directed to frontiers and not central tendencies. Cooper et al (2011) are of the view that rather than trying to fit a regression plane through the center of data as in statistical regressions, the DEA approach floats a piecewise linear surface to rest on observations. Owing to this assertion, the DEA methodology is able to uncover relationships that would remain hidden from other measures. The DEA technique is able to ascertain the efficiency and performance of organizations in a straightforward manner without the recourse to assumptions and variations that are usually required in other models such as linear and nonlinear regression models (Cooper et al, 2011).

In evaluating the performance and efficiency of DMUs, the DEA approach does not assign any priori measures or information of relative importance to any input or output variable. The DEA approach calculates the distance of each DMU from the efficient frontier by determining by how much each DMU input should be reduced and each output should be increased for each DMU to reach the frontier. Thus, in line with the 'Pareto Principle', a DMU is said to be efficient (100%) if and only if none of its inputs or outputs can be improved without negatively affecting its other inputs or outputs. A DMU is regarded as been fully efficient (100%) on the premise of presented evidence if and only if the performances of similar DMUs do not indicate that some of their inputs or outputs can be improved without negatively affecting some of their other inputs or outputs. Likewise, inefficient DMUs have scores that are less than 100%. Therefore, in a standard DEA approach, a DMU is said to be efficient if its performance relative to other DMUs cannot be enhanced (Cook, Seiford, & Zhu, 2013; Paradi & Zhu, 2013).

Furthermore, the efficiency of a DMU is determined by its ability to transform inputs into desired outputs. Put differently, DEA assigns an efficiency score of 100% to an efficient DMU, and less than 100% to inefficient DMUs. A score less than 100% indicate that a linear combination of other DMUs from the sample could produce the same vector of outputs, using a small vector of inputs. The efficiency score reveals the radial distance from the estimated production frontier to the DMUs under evaluation, that is, the minimum proportional decrease in inputs yielding efficiency. Thus, DEA provides an efficiency rating (efficiency score) for efficient and inefficient DMUs. The efficiency score of DMUs is defined as:

$$Efficiency = \frac{Weighted\ Sum\ of\ Outputs}{Weighted\ Sum\ of\ Inputs}$$

In essence, the DEA approach considers how much total productivity can be improved, and ranks (efficiency scores) the productivity of individual DMUs (Ho & Zhu, 2004). Therefore, in this study, efficient DMBs will have efficiency scores of 100%, whereas inefficient DMBs will have less than 100%. However, efficiency scores are sensitive to changes in data and hinge greatly on the number and type of input and output factors considered (Casu & Molyneux, 2003). To that end, the specific input and output variables and the chosen period of evaluation will determine the efficiency scores of the examined Nigerian DMBs.

The advantages of the DEA model over other approaches for evaluating bank performance serves as the rationale for the choice of DEA for this study. The ability of the DEA approach

to concurrently capture the relationship between multiple inputs and multiple outputs is a common motivation for employing the DEA to measure performance. Specifically, DEA is conditioned to a broader view of performance measurement and this is regarded as its superior advantage over traditional financial ratio analysis, which typically depends on two variables in a ratio (Avkiran, 2011).

One advantage of the DEA model is that it does not institute any biased structure on data when determining efficient organizations (in this case, banks). In other words, DEA approach does not assume a specific production technology or correspondence. It distinguishes inefficient banks from efficient ones by comparing them (that is comparing similar firms), rather than associating or correlating a bank's performance with statistical averages (Paul & Kourouche, 2008).

In general, the non-parametric DEA approach is simple and easy to compute because it is not required to impose any assumptions about functional form, and it does not take into account the effect of random error and environmental noise (Sharma et al., 2013).

However, as with other techniques, the DEA has some disadvantages. One major downside is the need for homogeneity of the DMUs, which denotes that the analyzed institutions should use the same types of resources, generate similar classes of products and the conditions that contextualize the productive process should be identical (Cooper, Seiford & Tone, 2007).

Another drawback is that the DEA analysis technique is a deterministic model. It assumes that resulting inefficiencies are based absolutely and entirely on the mismanagement of the DMUs, thereby ignoring any possibility of random influences. Likewise, the DEA techniques demand that extra care should be taken in the selection of variables, owing to the reason that there are no applicable tests for the selection and evaluation of significance (Coelli, Rao, O'Donnell & Battese, 2005; Fuentes, Fuster & Lillo-Banuls, 2016).

Notwithstanding the disadvantages of the DEA analysis technique, the advantages of employing it to evaluate the performance of banks are greater and more significant than any potential drawbacks. For that reason and due to its use in similar studies, as presented in the literature review chapter, this method was selected for this study.

4.7.2.1 DEA Efficiency Measures

Efficiency is referred to as a technical term, and it is a sign of efficacy. The DEA technique holds that any producing unit (bank) is said to be technically efficient when it can produce the maximum amount of output while using a given level of input. The non-parametric frontier requires that for the chosen inputs, the highest level of output realizable from those chosen inputs are in line with the available DMU data under alternative assumptions that could be made about production. For instance, under the DEA methodology, it might be assumed that banks operate under the constant returns to scale (CRS) or under variable returns to scale (VRS) (Cooper et al., 2007).

Farrell (1957) asserted that components of efficiency are technical efficiency and allocative efficiency. Farrell opined that a DMU is technically efficient when it is able to obtain maximum output from a given set of inputs. Whereas allocative efficiency indicates a DMU's ability to utilize inputs in optimal proportions, given their respective prices and production technology (Coelli et al, 2005). Therefore, the technical efficiency of Nigerian DMBs are evaluated under the variable returns to scale (VRS) assumption.

To further drill down, Farell (1957) referred to 'technical efficiency' in terms of an organization's success at producing the maximum amount of output, given a particular set of inputs. The DEA generated technical efficiency scores for a DMU (bank) is a relative measure indicating the particular DMU's input-output conversion performance in comparison to what is possible according to the frontier. It is worth noting that the measure is specific to the sample and a DMU is only 100 per cent efficient in the event that there is no evidence of inefficiency when compared against all other DMUs. In line with assumptions of Farrell (1957), the production frontier is composed of the most efficient DMUs evaluated, whereas relatively inefficient DMUs fall below the frontier.

In this study, DMBs are benchmarked against the most efficient DMBs in the industry, that is, the relative efficiency of each DMB is measured against the frontier. The fully efficient DMBs form a best practice production frontier and are 'benchmark' peers for inefficient DMBs (Rouse, Harrison, & Chen, 2010). Therefore, a bank is technically efficient when it is able to convert multiple resources at its disposal to multiple financial services at a profit (Bhattacharyya & Kumbhakar, 1997). On the contrary, a DMB is said to be technically inefficient if it operates underneath the frontier.

Furthermore, in evaluating technical efficiency, two extended DEA models can be operated. These are the CCR model and the BCC model. Brief discussions about the two models are presented below.

4.7.2.2 CCR Model

CCR Model denotes Charnes, Cooper, and Rhodes (1978), the originators of the model. Their work extended the works of Farrell (1957) by incorporating the concept of multiple inputs and multiple outputs. The CCR model is anchored on the assumptions of constant return to scale (CRS). The CCR model assumes that a constant relationship exists between inputs and outputs. For example, if one input yields three outputs, then two inputs would yield six outputs. Additionally, the CCR model does not discern between pure technical inefficiencies and inefficiencies due to variable returns. Hence, the assumption of constant returns to scale (CCR) is only justified when all DMUs in a sample are operating at an optimal scale. Thus if the CRS assumption is made when some of the DMUs are not operating at an optimal scale, the computed technical efficiency scores will be tainted with scale efficiency (SE) (Cooper et al., 2007; Lin et al., 2009; Sufian & Habibullah, 2012).

A pictorial representation of the CCR model is shown in figure 4.3 below.

Figure 4.3: The CCR Production Frontier
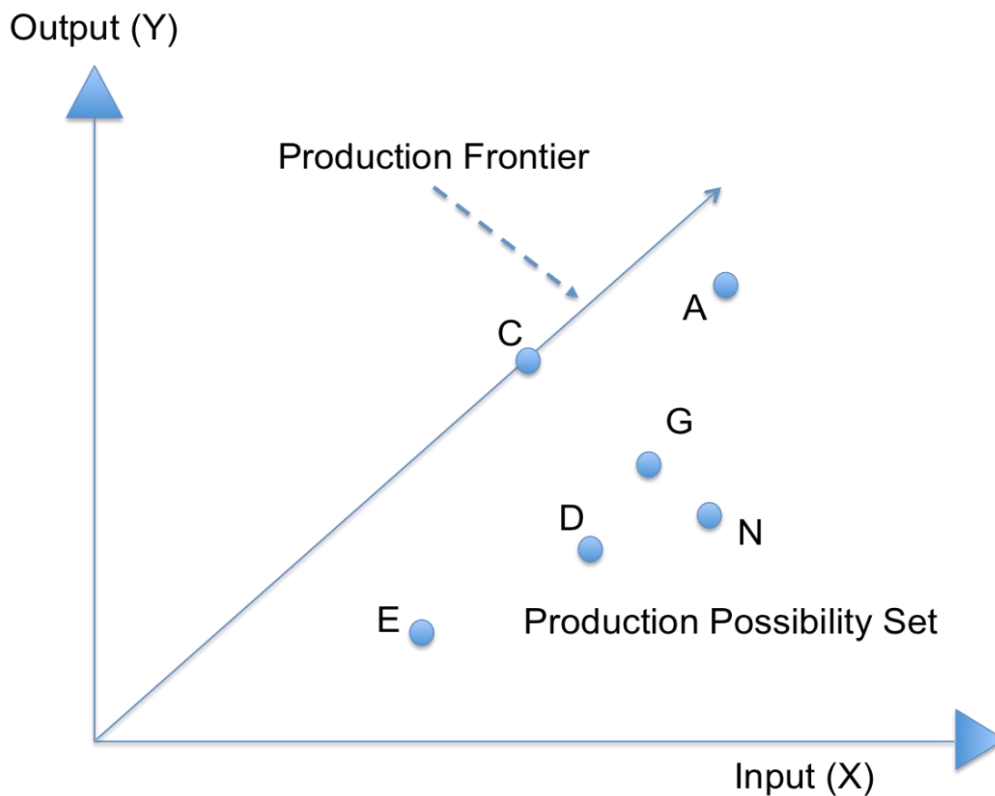
Adapted from Cooper, Lawrence, & Tone (2006)

In relation to figure 4.3 above, it is assumed that there is only one input and one output. Centered on the constant returns to scale assumption (CCR model), the DMU at point *C* situated on the efficient (production) frontier is the sole CCR-efficient DMU for the reason that its efficiency score equal 100% or 1. The other DMUs (i.e. *A, D, E, G*, and *N*) are inefficient owing to their efficiency scores being less than 100% or 1. Moreover, the CCR model implies that no DMU situated under the frontier (straight line) is more efficient than DMU *C*. In, like manner, no input/output combination in the inefficient DMUs could produce efficiency scores higher than that of DMU-*C*.

4.7.2.3 BCC Model

Likewise, the **BCC Model**, Banker, Charnes, Cooper (1984) broadened the previous works of Farrell (1957) and the 1978 CCR model. They were of the view that if efficiency is

hypothetically measured under the CRS assumption, a DMU may be inefficient and might not have allocative efficiency, scale efficiency, and technical efficiency. Consequently, Banker et al (1984) introduced the variable returns to scale (VRS) hypothesis that breaks down technical efficiency (TE) into pure technical efficiency (PTE) and scale efficiency (SE), and it is called the BCC model. Theoretically, the VRS assumption offers the measurement of pure technical efficiency (PTE), and it is the measurement of technical efficiency (TE) without the effects of scale efficiency (SE). The BCC model assumes that a variable relationship subsists between inputs and outputs. Therefore, if a proportional increase (or decrease) in inputs transpires into a different proportional increase (or decrease) in outputs, it can be opined that variable returns to scale are present (Cooper et al., 2007). For instance, if one input yields three outputs, but two inputs yields five outputs, it can be suggested that variable returns to scale subsist.

Furthermore, in view of the BCC model (variable returns to scale assumption), the best practice frontier encases the inefficient points more tightly. Hence, the distance between the inefficient DMUs and the efficient DMUs (best practice frontier) is less. As such, the efficiency scores under the BCC model are usually higher than the CCR efficiency scores (Cooper et al., 2007).

A pictorial representation of the BCC model is shown in figure 4.4 below:

Figure 4.4: The BCC Production Frontier
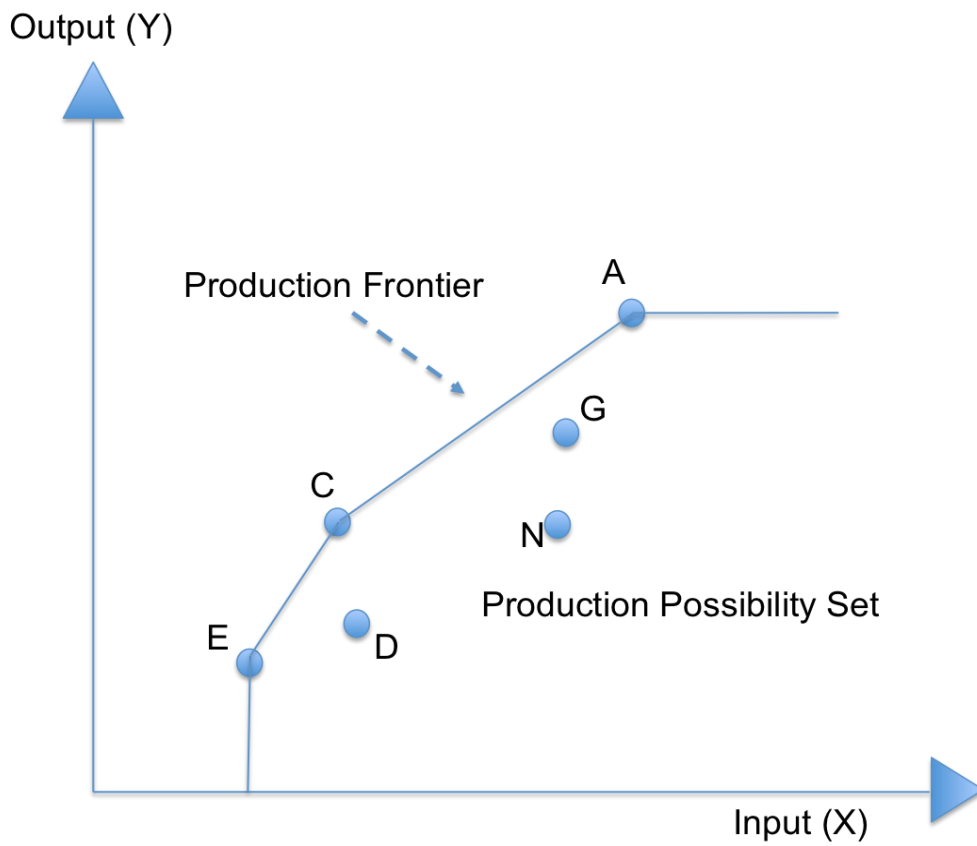
Adapted from Cooper et al. (2006)

Assuming the case of one input to one output, the production frontier of the BCC model depicted in figure 4.4 shows three efficient DMUs, which are DMUs *A, C,* and *E*. The line section that connects point *A* and point *C* indicates the increasing returns to scale (IRS) portion of the efficiency frontier, whereas the line segment that joins point *C* to *E* shows the decreasing returns to scale (DRS) portion of the efficiency frontier. And just like figure 4.3, *C* indicates the constant returns to scale (CRS) portion of the efficiency frontier. Apart from showing DMUs at increasing, decreasing, and constant returns to scale, figure 4.4, indicates that more DMUs appear efficient under the BCC model.

Therefore, based on the above theoretical descriptions, the mathematical depictions of the CCR and BCC models are presented below, as the variant of the DEA analysis (DEA Window Analysis) adopted for this study is discussed. However, even though both the CCR and BCC efficiency scores are calculated, this study relies largely on the BCC model for the analysis of efficiency. The BCC model is specifically adopted because it is viewed as an

upgrade on the CCR model. The CCR model is a specific type of the BCC model (Toloo & Nalchigar, 2009) and as such the BCC model is utilised in this study due to its capacity to take into consideration scale effects in order to ascertain the most productive scale size for each DMU. Put differently, by adjusting for "scale effects", the BCC model is in a better position to evaluate "pure" technical efficiency. Likewise, the BCC model is adopted because it ensures the discretization of technical efficiency from the effects of scale efficiency (Sahin, Gokdemir, & Ozturk, 2016). To that end, the BCC model is better than the CCR model in relation to providing policy recommendations, like the introduction of performance measures to embolden operations at the most productive scale size or the fine-tuning of performance outcomes in order to be able to control for scale differences (Alrashidi, 2015). More so, DMBs are determined to be more efficient under the BCC model which is based on the variable returns to scale assumption results in higher efficiency scores than under the CCR model. As such, DMBs may be efficient under the BCC model but not under the CCR model. Equally, an inefficient DMB (DMU) may have different efficiency scores depending on the model adopted.

4.7.2.4   DEA Window Analysis

As a model, window analysis tries to offer a more comprehensive treatment to the evaluation of efficiency changes over a time period (Charnes, Clark, Cooper, & Golany, 1985; Cook & Seiford, 2009). The DEA window analysis technique is based on the principle of moving averages (Cooper et al., 2007; Gu & Yue, 2011; Yue, 1992). A DMU in each different period is evaluated as if it were a different DMU in a different window. Explicitly, the performance of a DMU in a particular period (window) is compared against its own performance in other periods (windows) in addition to the performance of the other DMUs (Cooper et al., 2011).

Webb, Bryce, & Watson (2010) in line with Webb (2003) are of the view that the DEA window analysis technique is of advantage when examining the performance of the entire banking sector as well as units within individual organizations. They enumerated the advantages that also serve as motivation for the adoption of the DEA window analysis technique as follows:

- The technique makes it easy to analyse the performance of DMUs (banks) over a specified period of time taking into consideration cost/expenses and income/profits.

- The technique can also be utilized to examine stability and other properties of efficiency and performance across as well as within windows.

- DEA is at most useful when analysing closely homogenous organizations that operate in closely homogenous markets. For instance, comparing a bank in 2000 with another one in 2013 could render relative results meaningless. On this account, analysing banks in a three-year period "windows" reduces the problem and may be considered an improvement on the traditional DEA panel model.

- Each bank in the sample is treated as a different bank in a different period. This treatment increases the number of data points. Put differently, each bank in a different period is evaluated as if it was a different bank (independent) but remains comparable in the same period (Repkova, 2014). Therefore, the problem of small sample sizes is solved with this approach.

- The performance of a bank being analysed by the DEA windows technique in a period can be compared to itself and other banks over the course of time (Asmild, Paradi, Aggarwall, & Schaffnit, 2004; Repkova, 2014).

The window analysis has been only used in a handful of studies to ascertain the performance of banking institutions over a time period (examples of studies include Asmild et al., (2004) – Canadian banking industry, Gu & Yue (2011) – Chinese Listed banks, Sufian (2007) – Singapore commercial banking group, Kisielewska, Guzowska, Nellis, & Zarzecki, (2007) – Polish banking industry, Repkova (2014) – Czech banking sector).

Therefore, the performances of Nigerian DMBs have been evaluated using the DEA window analysis based on the advantages enumerated above and following the listed adaptations of the approach in various banking industries.

Consequently, this study has considered the following formulas in line with Asmild et al., (2004), Gu & Yue (2011)and Repkova (2014), where N DMUs ($n = 1, 2, …, N$) observed in T ($t = 1, 2, …, T$) periods using r inputs to produce s outputs. Let DMU_n^t represents a DMU_n in period t *with a r* dimensional input vector $x_n^t = (x_n^{1t}, x_n^{2t}, … x_n^{rt})'$ and s dimensional input vector $y_n^t = (y_n^{1t}, y_n^{2t}, … y_n^{st})'$. If windows start time k ($1 \leq k \leq T$) with window width w ($1 \leq w \leq t - k$), then the metric of inputs is given as follows:

$$X_{kw} = (x_1^k, x_2^k \ldots, x_N^{k+1}, x_2^{k+1}, \ldots, x_N^{k+1}, \ldots, x_1^{k+w}, x_2^{k+w}, \ldots, x_N^{k+w})'$$

And the metric of outputs as:

$$Y_{kw} = (y_1^k, y_2^k \ldots, y_N^{k+1}, y_2^{k+1}, \ldots, y_N^{k+1}, \ldots, y_1^{k+w}, y_2^{k+w}, \ldots, y_N^{k+w})'$$

The CCR model (constant returns to scales, CRS) of DEA window problem for DMU_n^t is given by solving the following linear program:

$$\min \quad \theta$$

Subject to $\qquad \theta'X_t - \lambda'X_{kw} \geq 0$

$$\lambda'Y_{kw} - Y_t \geq 0$$

$$\lambda_n \geq 0 \ (n = 1, 2, \ldots, N \times w).$$

The BCC model -variable returns to scales (VRS) formulation can be obtained by adding the restriction $\sum_{n=1}^{N} \lambda_n = 1$ (Banker *et al.,* 1984). The objective value of the CCR model is given as technical efficiency (TE), and the objective of BCC model is pure technical efficiency (PTE). The BCC model is given as follows:

$$\min \quad \theta$$

subject to $\qquad \theta'X_t - \lambda'X_{kw} \geq 0$

$$\lambda'Y_{kw} - Y_t \geq 0$$

$$\sum_{n=1}^{N} \lambda_n = 1$$

$$\lambda_n \geq 0 \ (n = 1, 2, \ldots, N \times w)$$

Importantly, there is no theory that justifies the most appropriate window size (Sufian, 2007). Asmild et al., (2004) in line with Charnes (1995) opined that major technological and environmental changes do not usually occur in narrow window widths, thus they suggested

that the adoption of a three or four-year window will result in more reliable comparable results. Likewise, Sufian (2007), Repkova (2014) and Reisman, Daouas, Oral, Rebai, & Gatoufi (2003) adopted the three-year window to examine bank performance in Malaysia, Czech, and Tunisia respectively. More so, the only study on DEA window analysis of the Nigerian banking sector by Tankoano (2013) adopted a three year window. Tankoano (2013) insinuated that the three-year window was used because banking institutions in a narrow window usually operated within the same technological and regulatory bracket. Additionally, radical environmental changes do not occur within narrow windows. Hence, the evaluation of banking institutions in a three-year window will offer more reliable results. Thus in a bid to ensure the reliability and credibility of the results of this study, the three-year window, which is consistent with the seminal DEA window analysis work of Charnes et al., (1985) and the Nigerian banking study by Tankoano (2013) is adopted.

To illustrate from table 4.1 below, the first window incorporates years 2000, 2001, and 2002. The earliest period is dropped anytime a new period is introduced. Looking at the table, the year 2000 is dropped in window two, and year 2003 is added to the window. Successively, years 2002, 2003 and 2004 are assessed in window three. The window analysis is performed in twelve (12) windows and ending in the analysis of years 2011, 2012 and 2013. And as suggested that each DMB is treated as a different entity in each year and there are 82 banks used in this study, the DEA window analysis technique results in 1,164 observations.

Table 4.1: Definition of Three-Year Window Analysis Period

Window 1	2000 2001 2002
Window 2	2001 2002 2003
Window 3	2002 2003 2004
Window 4	2003 2004 2005
Window 5	2004 2005 2006
Window 6	2005 2006 2007
Window 7	2006 2007 2008
Window 8	2007 2008 2009
Window 9	2008 2009 2010
Window 10	2009 2010 2011
Window 11	2010 2011 2012
Window 12	2011 2012 2013

4.7.2.5 Determining Input-Output Specifications

An important element of DEA rests on the appropriate selection of the input and output variables. Judging from the literature presented above, there is no consensus amongst researchers on the best combination of input and output variables. Even though there are various models for selecting inputs and outputs, the production and the intermediation approaches are the two main approaches competing in literature in regards to the definition and measurement of the input and output variables (Avkiran, 2006). Avkiran submitted that the other models are the value-added approach and the user-cost approach.

The production approach views financial institutions as the producers of services for account holders. The producers process documents and perform transactions on deposit accounts such as loans. According to the production approach, the number of accounts and related transactions is the best measure of output, while the number of employees and physical capital is considered as inputs (Ferrier & Lovell, 1990; Fried, Lovell, & Vandeneeckaut, 1993; Sherman & Gold, 1985). Neal (2004) and Sathye (2003), followed this approach.

The value-added approach is a variation of the production approach. Under the value-added approach, labour, purchased funds and physical capital are categorized as inputs, whereas high value generating activities requiring large expenditures on labour, as well as physical capital such as making loans and taking deposits are categorized as outputs(Avkiran, 2006; Berger & Humphrey, 1992; Wheelock & Wilson, 1995).

The user-cost approach on the other hand, describes an asset as an output if the financial returns outweigh the opportunity cost of funds. Likewise, a liability item is considered an output if its financial costs are less than its opportunity costs. However, if none of the conditions above are satisfied, both the assets and liabilities are classified as inputs (Hancock, 1991). Hancock (1986) is considered as the pioneer of the user-cost approach and he opined that the user-cost approach can be applied for the computation of all the assets and liabilities on the balance sheet. In application, the user-cost approach is somewhat confusing as the designation of assets and liability items as inputs and outputs are subject to change in accordance with movements in service charges and interest rates (Berger & Humphrey, 1992; Grigorian & Manole, 2002; Hancock, 1986, 1991).

The Intermediation approach views banks as the intermediaries that transform and transfer financial assets from the surplus side of the economy to the deficit side of the economy. This study follows this approach. Additionally, this approach consists of several conceptualizations when defining the appropriate inputs and outputs. Some of these conceptualizations define inputs in terms of capital costs, deposits, and labour and define outputs in terms of financial investments and loans (Kirkwood & Nahim, 2006). Another conceptualization defines inputs in terms of expenses and outputs in terms of revenue (Paul & Kourouche, 2008). This study follows a variant of the intermediation approach which makes use of elements of the two conceptualizations as used by Yue in his study of the performance of Missouri banks in1992.

Table 4.2: Input and Output Variables

Inputs	Outputs
Interest Expenses (IE)	Interest Income (IC)
Non-Interest Expenses (NIE)	Non-Interest Income (NIC)
Total Deposits (TD)	Total Loans (TL)

The advantage of employing these particular variables is that they capture all the costs incurred by banks in running their operations and the revenue they generated as a result of their activities. Therefore, how successful DMBs are in maximising profitability and efficiency in the Nigerian banking sector is the motivation for adopting the intermediation approach that utilises the particular input and output variables (Table 4.2). More so, the inputs and outputs were specifically chosen because they cover revenue and costs of DMBs. Additionally, the inputs (interest expenses, non-interest expenses), and the outputs (interest income and non-interest income) are variables from the income statements of DMBs. While the input "total deposits" and the output "total loans" are variables from the balance sheet.

Furthermore, DEA studies are either input-oriented or output-oriented. Input-oriented models are used to examine if DMUs can reduce their inputs while keeping outputs at current levels. The input-oriented model therefore seeks to identify technical inefficiency as a proportional reduction in input usage. On the other hand, the output-oriented model is used to determine if DMUs can be increase their outputs while keeping inputs at their current levels. Also an inefficient DMU is made efficient through the proportional increase of its output, whereas its inputs remain unchanged in an output-oriented model. Furthermore, inefficient DMUs can be made more efficient by projections onto the frontier. However, model orientation controls the direction of the projection for inefficient DMUs. Efficiency can be improved in the input-oriented model via the proportional reduction of inputs, whereas improving efficiency in the output-oriented model entails proportional augmentation of outputs (Martic, Novakovic, & Baggia, 2009; Zhu, 2014).

On account of the above, this study adopts the input-oriented model. Although theoretical literature is inconclusive as to the best choice amongst the alternative orientations, most studies have tended to adopt the input-oriented model. More so, proponent users of the input-oriented model are of the view that input quantities appear to be the primary decision variables. However, it is crucial to highlight that the input- and output-oriented models will estimate the same frontier and hence, by definition, identify the same set of efficient DMUs (Casu & Molyneux). In particular, the Nigerian banking reforms were aimed at increasing the capacity (efficiency, profitability, and stability) of DMBs. Therefore, the Nigerian banking reforms sought to minimise inputs with the view of producing a given level of output or increasing the level of output of Nigerian DMBs. On that account, the input-oriented DEA approach is adopted in this study.

Finally, the inputs and outputs variables based on the intermediation approach, were also chosen based on the effects of the 2005 and 2009 banking reforms on DMBs financial statements. On the premise that the 2005 and 2009 banking reforms affected all aspects of Nigerian banking operations, the DEA efficiency scores are calculated only from the financial statements of DMBs.

4.7.2.6 Description and Sources of DEA Data

The data set covering the period of 2000 − 2013 of the selected input and output variables from eighty-two DMBs is used in this study. Prior to the 2005 banking reforms, the Nigerian banking sector had a total of eighty-nine (89) DMBs. Due to the various mergers and acquisitions, and purchase and assumption agreements, the numbers of DMBs were reduced to twenty-five (25) at the end of 2005. However, at the time of data collection and at the beginning of this study, the Central Bank of Nigeria put the number of DMBs operating in Nigeria at twenty-one (21). The data used in this study was obtained from the Bureau Van Dijk Bankscope Database. The choice of eighty-two DMBs was due to the availability of data in the database. Even though it was the intention of this study to include input and output data from all the eighty-nine (legacy) DMBs, the database only had information on eighty-two (82).

It is also worth noting that the number of DMBs utilized in this study is limited to the availability of data, and for the sake of uniformity, only data from the Van Djik Bankscope Database is used. The number of DMBs continuously fluctuates throughout the span of the study due to the merger and acquisitions, and the purchase and assumption agreements that occurred during and after the 2005 banking consolidation reforms. More so, the names and numbers of DMBs kept changing as a result of the host merger and acquisitions that transpired and the nationalisation of three banks into bridge banks. This study includes the three bridge banks because the utilisation of the bridge banking model is novel to the Nigerian banking sector with the view of uncovering if the performance of the nationalised DMBs have improved. As a result, an unbalanced panel is used in this study.

4.7.2.7 Justification for Using DEA Window Analysis

Although advantages of the traditional DEA technique and those of the DEA Window analysis technique have been discussed in previous sections of this chapter, this section centers particularly on the reasons the DEA Window Analysis technique is appropriate for this study.

The conventional DEA is only performed in a single period, therefore limiting the measurement of performance changes when there is more than a single period as it is the case in this study. Therefore, as the window analysis technique is anchored on the principle of moving averages, it is suitable for measuring performance in cross-sectional and time-varying data. As a result, its adoption in this study is to detect changes in the performance of Nigerian DMBs from 2000 - 2013(Charnes et al, 1985; Savic, Radosavljevic, & Ilievski, 2012).

An additional defence to the employment of the DEA window analysis is its ability to capture chronological changes in the performance of banks and show the short-term evolution from one window to another. Therefore, the DEA window analysis technique is a more robust way of measuring bank performance (Repkova, 2014). In view of this study, and in relation to the reforms that took place in the Nigerian banking sector, the technique is able to evaluate the performance of DMBs both before and after the reforms in several windows. The results obtained show how DMB performance slowly evolved in different periods and if a particular event had an impact on the performance of the DMBs.

Another main justification for utilizing the DEA window analysis in this study stems from its relative little application in the Nigerian banking industry. The relative application of this approach suggests that this study will contribute to DEA and bank performance literature. As one of the first studies to utilize the DEA window analysis in bank performance studies in Nigeria, it sets precedence for further application of the approach in banking performance studies in Africa and other emerging economies.

The Nigerian banking sector consists of few DMBs (twenty-one to be specific). Several studies share the view that the DEA window analysis technique is appropriate for the analysis of small sized banking industries, as banks are treated as different entities in different windows (Asmild et al., 2004; Nguyen, Roca, & Sharma, 2014; Sufian 2007). Hence, the application of the technique will provide the opportunity of obtaining a robust view of efficiency changes and performance of Nigerian DMBs from 2000 -2013.

Equally, the unavailability of other sources of robust data makes the choice of adopting the DEA window analysis easy. DEA makes use of data from annual financial statements. The availability of a database with data from annual financial statements ensures that results obtained can be relied upon and validated.

Finally, the disadvantages of the DEA approach already mentioned also apply to the DEA window analysis. However, the above submissions buttress the view that it is suitable for application to the evaluation of the performance of commercial banks.

Progressively, the next section of this chapter will focus on multiple regression estimations. The various regression models adopted for uncovering the relationship of bank performance variables, banking stability variables, and the calculated DEA efficiency scores are presented and discussed.

4.7.3   Multiple Regression Analysis

This section dwells on the multiple regression analysis of bank performance, efficiency and stability of Nigerian deposit money banks (DMBs) from 2000 to 2013. The regression models to suit the aims and objectives of the study are also presented. Additionally, the efficiency scores obtained from the DEA window analysis and the Z-Score (a proxy for banking

stability) are regressed against the bank specific CAMELS proxies to infer whether the methods, when harmonized, uncover any further disparity in the performance of DMBs. More so, the variables employed in this study that draw inferences and establish relationships that were influenced by the 2005 and 2009 banking reforms and the global financial crisis in the Nigerian banking sector are presented and explained in this section.

The general purpose of multiple regression analysis is to learn more about the relationship between a dependent variable and several independent or predictor variables. Multiple regression analysis describes the relationship between a dependent variable and numerous independent variables. It examines the simultaneous effects that some independent variables have over one dependent variable (Hinton, 2014).

There are several multiple regression analyses techniques that dwell on either time series or cross-sectional data. However, for the purpose of this study, panel data regression is employed because available data contain both time series and cross-sectional elements. A panel of data embodies information across time and space and most importantly, a panel retains the same entities and measures some quantity about them over time (Brooks, 2008). As such, this study employs the use of the panel data regression to analyse the performance of Nigerian DMBs from 2000 – 2013.

Additionally, the advantages of Panel Data (Baltagi, 2013; Gujarati & Porter, 2009), that reinforced the utilization of panel data regressions are presented below:

1. Panel data relates to individuals, firms, states, countries, regions, etc., over time, and as such, there is bound to be heterogeneity in these units. And estimation techniques for panel data can take such heterogeneity explicitly into account by allowing for subject specific variables.
2. Panel data combines time series of cross-section observations, thus providing more informative data, more variability, less collinearity among variables, more degrees of freedom and most importantly more efficiency.
3. By repeatedly studying cross sections of observations, panel data estimation techniques are better suited to study the dynamics of change.
4. Panel data estimation techniques can better detect and measure effects that cross-section or pure time series cannot.

5. Panel data enables the study of more complicated behavioural models. For instance, phenomena like economies of scale and technological change are better handled by panel data estimation techniques than by pure cross-section or pure time series data.

6. Panel data minimizes the bias that might arise when individuals or firms are aggregated into broad categories due to the availability of several thousand units.

Econometrically, the panel data standard linear model can be written as follows (Verbeek, 2012; Brooks, 2014):

$$Y_{it} = \beta_0 + X_{it}\beta + \varepsilon_{it}$$

Where Y_{it} is the dependent variable for firm $-I$ at time-t; β_0 is the intercept term; X_{it} is a k-dimensional vector of independent variables; ε_{it} is the error term; the error term changes over individuals and time, and encompasses all unobservable factors that affect Y_{it}.

Moreover, in examining the panel data set through multiple regression techniques, this study is aware of the treatment of the possibilities of individual effects in the adopted models. Individual effect implies that each individual has a divergent effect. There are two core individual effects models in panel data analysis: the fixed effects model and the random effects model (Koop, 2008).

The **Fixed Effects Model (FEM)** takes into account the existence of each individual effect of the observations in a particular model. Put differently, the FEM allows for heterogeneity or individuality among entities by allowing them have separate intercept values. Hence, the individual effect subsists when it is assumed that each entity can have diverse intercepts in a particular model. Econometrically, the fixed effects model can be expressed as the equation below (Koop, 2008).

$$Y_{it} = a_i + X_{it}\beta + \varepsilon_{it}$$

The above equation is almost similar with the common pooled model. Where, a_i symbolizes a fixed (individual) effect. The difference resides in a_i, which varies across entities. Hence, it allows each entity to have its own separate intercept.

While the **Random Effects Model (REM)** just like the fixed effects model suggests different intercept terms for each entity and again these intercepts are constant over time, with the relationships between independent and dependent variables assumed to be same, both cross-sectionally and temporally (Brooks, 2014).

Nonetheless, the divergent view is that under the random effects model, the intercepts for each cross-sectional unit are presumed to originate from a common intercept, which is the same for all cross-sectional units and over time, in addition to a random variable that varies cross-sectionally but remains constant over time.

The random effects model can be written as:

$$Y_{it} = \beta_0 + X_{it}\beta + a_i + u_{it}$$

Where, X_{it} is a k-dimensional vector of independent variables, but unlike the FEM, there are no dummy variables to capture the heterogeneity (variation) in the cross-sectional element; $\varepsilon_{it} = a_i + u_{it}$, which implies that the error term consist of two components: an individual specific component that does not vary over time, and a remainder component that is assumed to be uncorrelated over time (Brooks, 2014; Verbeek, 2012).

Moreover, in deciding whether to adopt either the FEM or the REM, this study employs the *Hausman-test*. According to Koop (2008), the idea behind the *Hausman-test* rests on the assumption that if $H0$ (the individual effect is uncorrelated with any of the independent variables) is true, then both the FEM and REM estimators are consistent and provide relatively identical results. But, in the instance where '$H0'$ is false, the REM will be inappropriate, while FEM will be suitable, and the results obtained could be quite dissimilar.

In a nutshell, multiple regression analysis makes it possible to analyse the relationships between background variables (CAMELS proxies and macroeconomic variables) and the dependent variables (bank efficiency scores, bank performance indicators, and bank stability indicator) of interest under the fixed effects or random effects models. In essence, panel data regression analysis is employed to evaluate the relationship between the efficiency scores (obtained from the Data Envelopment Window Analysis), ROA (proxy for bank performance) and Z-Score (proxy for bank stability) against bank specific CAMELS proxies, bank size, and GDP.

4.7.3.1 Multiple Regression Models

The regression models below dwell on the effects the capital adequacy, asset quality, management quality, earning capacity, liquidity profile, sensitivity to market risk, the size of Nigerian deposit money banks, and the Gross Domestic Product on bank efficiency, bank performance, and financial stability. The first three models are the base models on which the extensions are generated to further ascertain the effects of the independent variables on efficiency, performance, and financial stability.

Bank Efficiency

Base Model 1: $BCC_{it} = \beta_0 + \beta_1 ETA_{it} + \beta_2 ILGL_{it} + \beta_3 CIR_{it} + \beta_4 NIM_{it} + \beta_5 LADSTF_{it} + \beta_6 TSTA_{it} + \beta_7 SIZE_{it} + \beta_8 GDP_{it} + \varepsilon_{it}$

BCC (dependent variable) is the proxy for bank efficiency in model 1a. Thus, BCC is regressed against capital adequacy (ETA), asset quality (ILGL), management quality (CIR), earning capacity (NIM), liquidity (LADSTF), sensitivity to risk (TSTA), bank size, and GDP in model 1.

Bank Performance

Return on assets (ROA) it the proxies for bank performance and it is the dependent variable used to ascertain the impact of capital adequacy (ETA), asset quality (ILGL), management quality (CIR), earning capacity (NIM), liquidity (LADSTF), sensitivity to risk (TSTA), bank size, and GDP on bank performance. ROA is the dependent variable in model 2.

Base Model 2: $ROA_{it} = \beta_0 + \beta_1 ETA_{it} + \beta_2 ILGL_{it} + \beta_3 CIR_{it} + \beta_4 NIM_{it} + \beta_5 LADSTF_{it} + \beta_6 TSTA_{it} + \beta_7 SIZE_{it} + \beta_8 GDP_{it} + \varepsilon_{it}$

Financial Stability

Similarly, Model 3 employs the Z-Score as the dependent variable.

Base Model 3: $ZScore_{it} = \beta_0 + \beta_1 ILGL_{it} + \beta_2 CIR_{it} + \beta_3 NIM_{it} + \beta_4 LADSTF_{it} + \beta_5 TSTA_{it} + \beta_6 SIZE_{it} + \beta_7 GDP_{it} + \varepsilon_{it}$

Z-score is employed as a dependent variable to examine if the stability of banking institutions is affected by bank-specific CAMELS variables, bank size, and GDP. Put differently, the model seeks to empirically test the relationship between the bank stability measure (Z-Score) and asset quality, management quality, earning capacity, liquidity, sensitivity to risk, bank size, and GDP. Capital adequacy (ETA) is removed from this model because it is used for the calculation of the dependent variable (Z-score).

Additionally, in order to ascertain the effects of the 2005 and 2009 banking reforms on efficiency, bank performance and financial stability, the sample period is divided into three periods. The sample period was divided as follows, pre-2005 reforms period (2000 – 2004), 2005 reforms and global financial crisis period (2005 – 2008), and 2009 reforms and post-global financial crisis period (2009 – 2013). Hence, the results obtained from the various periods are compared with the results of the entire period (2000 – 2013).

4.7.3.2 Model Extensions

Introduction of Dummy Variables

To further confirm the effects of the 2005 and 2009 banking reforms on the efficiency, performance, and stability of Nigerian DMBs, dummy variables are introduced. Dummy variables are used in the analysis of efficiency, performance, and stability to split data into periods where DMBs went through reforms and normal periods. On that account, a dummy variable taking the value of '1' for reforms periods and a value of '0' for normal periods is introduced. Dummy 1 which is the proxy for the 2005 banking reforms starts from 2005 and ends in 2008. Hence, the period of 2005 to 2008 take the value of '1', while other periods assume the value of '0'. In like manner, Dummy 2 which is the proxy for the 2009 banking reforms starts from 2009 and ends in 2013. To that end, the period of 2009 to 2013 assume the value of '1', while all other years (2000 – 2008) take on the value of '0'. Consequently, in line with the base regression models (model 1 – model 3) the extended models (model 4 – model 6) are redefined as follows:

Bank Efficiency

Extension Model 4: $BCC_{it} = \beta_0 + \beta_1 ETA_{it} + \beta_2 ILGL_{it} + \beta_3 CIR_{it} + \beta_4 NIM_{it} + \beta_5 LADSTF_{it} + \beta_6 TSTA_{it} + \beta_7 SIZE_{it} + \beta_8 GDP_{it} + \beta_9 DU1_{it} + \beta_{10} DU2_{it} + \varepsilon_{it}$

Bank Performance

Extension Model 5: $ROA_{it} = \beta_0 + \beta_1 ETA_{it} + \beta_2 ILGL_{it} + \beta_3 CIR_{it} + \beta_4 NIM_{it} + \beta_5 LADSTF_{it} + \beta_6 TSTA_{it} + \beta_7 SIZE_{it} + \beta_8 GDP_{it} + \beta_9 DU1_{it} + \beta_{10} DU2_{it} + \varepsilon_{it}$

Financial Stability

Extension Model 6: $ZScore_{it} = \beta_0 + \beta_1 ILGL_{it} + \beta_2 CIR_{it} + \beta_3 NIM_{it} + \beta_4 LADSTF_{it} + \beta_5 TSTA_{it} + \beta_6 SIZE_{it} + \beta_7 GDP_{it} + \beta_8 DU1_{it} + \beta_9 DU2_{it} + \varepsilon_{it}$

It is worth noting that apart from the inclusion of the dummy variables, the independent variables of model 4 – model 6 remain the same as those of the base models (model 1 – model 3).

Introduction of Lagged Independent Variables

Additionally, it is not uncommon to find that the efficiency, performance and stability of banking institutions in the current period depend, amongst other things, on the operations of the previous period. To that end, the independent variables are lagged by 1 year as follows.

Bank Efficiency

Extension Model 7: $BCC_{it} = \beta_0 + \beta_1 ETA_{it-1} + \beta_2 ILGL_{it-1} + \beta_3 CIR_{it-1} + \beta_4 NIM_{it-1} + \beta_5 LADSTF_{it-1} + \beta_6 TSTA_{it-1} + \beta_7 SIZE_{it-1} + \beta_8 GDP_{it-1} + \varepsilon_{it}$

Bank Performance

Extension Model 8: $ROA_{it} = \beta_0 + \beta_1 ETA_{it-1} + \beta_2 ILGL_{it-1} + \beta_3 CIR_{it-1} + \beta_4 NIM_{it-1} + \beta_5 LADSTF_{it-1} + \beta_6 TSTA_{it-1} + \beta_7 SIZE_{it-1} + \beta_8 GDP_{it-1} + \varepsilon_{it}$

Financial Stability

Extension Model 9: $ZScore_{it} = \beta_0 + \beta_1 ILGL_{it-1} + \beta_2 CIR_{it-1} + \beta_3 NIM_{it-1} + \beta_4 LADSTF_{it-1} + \beta_5 TSTA_{it-1} + \beta_6 SIZE_{it-1} + \beta_7 GDP_{it-1} + \varepsilon_{it}$

Furthermore, the independent variables are lagged because regulatory submissions (chapter 2) held that Nigerian DMBs were still settling down in 2006 in reaction to the host of changes engineered by the 2005 banking reforms. More so, the independent variables are lagged to handle the two-way causality problem and bad control problems.

4.7.3.3 Multiple Regression Variable Definition

Dependent Variables

- ❖ DEA Window Analysis Efficiency Scores: Average Annual BCC Efficiency Scores
- ❖ Bank Performance Variables: Return on Assets (ROA)
- ❖ Bank Stability: Z-Score

Independent Variables

- ❖ CAMELS
  - Capital Adequacy – Equity/Total Assets Ratio (ETA)
  - Asset Quality – Impaired Loans/Gross Loans Ratio (ILGL)
  - Management Quality – Cost to Income Ratio (CIR)
  - Earnings – Net Interest Margin (NIM)
  - Liquidity – Liquid Assets/Deposits & Short Term Funding Ratio (LADSTF)
  - Sensitivity to Risk – Total Securities/Total Assets Ratio (TSTA)

❖ Non-CAMELS Variables

- Bank Size – Natural log of Total Assets (SIZENLTA)

❖ Macroeconomic Variables

- Gross Domestic Product Growth – GDP

4.7.3.4 Multiple Regression Variable Explanation

Bank Efficiency: Average Annual BCC Efficiency Scores

DEA efficiency scores have been used as dependent variables in various banking studies. For instance, Seelanatha (2012) regressed the efficiency scores of Sri Lankan commercial banks against a range of explanatory variables. Chortareas et al (2012) engaged in a second stage analysis and used efficiency scores as dependent variables in a truncated regression analysis of banks in the European Union. Sathye (2001) examined the efficiency of Australian banks and used overall efficiency from DEA analysis as a dependent variable. Maghyereh & Awartani (2014) in examining the effect of market structure, regulation and risk on bank efficiency in Gulf Cooperation Council Countries adopted technical efficiency scores as a dependent variable in a truncated panel data regression.

In like manner, this study adopts the average annual BCC efficiency score as the proxy for efficiency. This study relies on the BCC efficiency scores of the window technique to ascertain the efficiency level of individual DMBs. Given that a three-year window is used and there are mostly three efficiency scores for a single year. The average yearly efficiency score for the examined DMBs are utilised. Therefore, due to the elaborate review of the DEA technique in subsequent sections, the DEA technique is not extensively reviewed here. However, the target of the employment of the average annual BCC efficiency score is to ascertain the influence of bank-specific CAMELS ratios and macroeconomic factors on efficiency.

Bank Performance Indicators: Return on Assets (ROA)

The performance of banking institutions can be measured by several variables. And as such, there is no specific theoretical viewpoint or sufficient empirical evidence that upholds the superiority of any specific performance proxy over others. On this account, this study adopts the Return on Assets (ROA) as the preferred proxy for bank performance. More so, the Return on Assets (ROA) is one of the most commonly used proxies of bank performance adopted in banking performance literature.

ROA determines profitability which is net income after taxes for the year relative to total average assets. ROA is an internal performance measure of shareholder value, and it is a very popular measure of performance due to: (1) it presents an avenue for the direct assessment of the financial returns of shareholders; (2) it is easily accessible for analysts, investors and researchers who rely on public information; and (3) it also allows for comparison between different institution or different sectors of the economy (Daly & Zhang, 2014). Nonetheless, the ROA is biased upwards for banks that make substantial portions of their profits from off-balance sheet operations, for instance, derivative activities, as these activities generate revenue and expenses that are not recorded as assets (Rhoades, 1998).

Numerous studies have emphasized the importance of the ROA as an adequate measure for evaluating bank performance. Amongst various studies, the following studies recently made use of the ROA as proxy of bank performance. Ghosh (2015) utilised the ROA to evaluate the performance of MENA banks during the Arab Spring. Tunay, Tunay, & Akhisar (2015) used the ROA as a measure of performance to estimate the interaction of Internet banking and bank performance. Daly & Zhang (2014) employed the ROA to comparatively analysis the performance of Chinese-owned in Hong Kong. Shah & Jan (2014) also utilised the ROA as a dependent variable to analyse the financial performance of private banks in Pakistan. Though ROE was also used as a measure of performance in some of the studies above, the ROA is adopted as the preferred indicator of performance in this study because it takes debt into account (Lui, 2013).

Additionally, the Nigerian banking consolidation reforms of 2005 and 2009 banking reforms centered on recapitalization, translated to increase in bank assets. All the surviving banks after the 2005 banking consolidation reforms either raised funds through public offers or private placements. More so, various mergers and acquisitions transpired, in addition to purchase and assumption transactions boosted the asset level of Nigerian banks (CBN, 2006;

NDIC, 2006). Thus, the utilization of the ROA as a dependent variable is based on the above and as well as its use in literature.

Financial Stability Indicator: Z-Score

The Z-score is a book-based indicator that is used as a proxy for banks' distance to default. The Z-score has been widely used in literature as a stability indicator (Cihak & Hesse, 2010; Demirguc-Kunt & Detragiache, 2011; Fu et al., 2014; Ghosh, 2014; Laeven & Levine, 2009). Thus, it is used to indicate the stability of each DMB in the sample within the period of 2000 − 2013.

Additionally, from a statistical point of view, the Z-score indicates the critical threshold of standard deviations that a ROA realization has to drop below its expected value before equity is exhausted and a DMB becomes insolvent. Whereas, from an economic viewpoint, the Z-score initially measures the probability of a DMB becoming insolvent when the value of assets becomes lower than the value of debt. Hence, a higher (lower) Z-score implies a lower (higher) probability of insolvency risk (Uhde & Heimeshoff, 2009).

The Z-score formula as used in Boyd & Runkle (1993) Chiaramonte et al., (2015) Cihak & Hesse (2010) and Kasman & Carvallo (2014) and adopted in this study is defined below as:

$$Z_i = \frac{\overline{ROA_i} + \overline{E_i/Q_i}}{\sigma_{ROA}^i}$$

Where Z_i is the Z-Score for bank i, $\overline{ROA_i}$ and $\overline{E_i/Q_i}$ are the mean return on assets and ratio of equity to assets, respectively, for bank i during the sample period, and σ_{ROA}^i is the ROA standard deviation for bank i during the sample period.

The attractiveness of the Z-score measure rests on the fact that it does not require strong assumptions and can be used for the assessment of small and large banks. As opposed to the market-based risk measures, which can only be calculated for listed institutions, the Z-score can be computed for both listed and unlisted banks. It is a more direct measure of soundness compared to other measures of risk (Ghosh, 2014).

Despite the above advantages, the Z-score is also plagued by a few disadvantages. Firstly, its reliability depends on the quality of the accounting and auditing framework employed. In addition, the Z-score may offer positive assessments of bank distress/soundness if banks smooth accounting data over time. Secondly, the Z-score and market-based measures like the distance-to-default assess banks individually, thus potentially downplaying the risk that the failure of one bank may impact negatively on other financial institutions in the system (Chiaramonte et al., 2015).

Regardless of the disadvantages ascribed to the Z-score, it is employed as a proxy for bank soundness and stability in this study. In relation to the view that the accuracy of the Z-score can be hampered by the reliability of the accounting and auditing framework, this study makes use of variables obtained from the Bankscope database to calculate the Z-Score for individual DMBs.

Bank-Specific CAMELS Variables

Capital Adequacy Proxy – Equity/Total Assets Ratio (ETA)

This proxy determines how well banks are able to cope with shocks to their bottom-line. Capital adequacy is measured in relation to the relative risk weights apportioned to the diverse category of assets held both on and off balance sheet items (Sahut & Mili, 2011). It is assumed that better-capitalised banks are less exposed to distress. A low Equity to Total Assets Ratio means high leverage, which implies that a bank is less likely to be able to withstand shocks (Chiaramonte et al. 2015; Naceur & Kandil, 2009; Petria et al., 2015; Sufian et al., 2016).

Asset Quality Proxy – Impaired Loans/Gross Loans Ratio (IL/GL)

Asset quality indicators reveal symptoms of difficulties with the loan portfolio of banks. Problems with the asset quality of banks are typically assumed to lower profitability. More so, the solvency of banks is typically at risk when their assets become impaired. Therefore, it is essential that the asset quality indicators of banks are monitored in order to spot upsurge in specific risk areas such as an increase in the volume of non-performing loans (Sahut & Mili, 2011). A bank whose borrowers default on their repayments may likely encounter cash flow

problems that eventually impact on its liquidity. Thus, the Impaired Loans (NPL) to Gross Loans ratio is utilised as an indicator of asset quality because it captures the quality of disbursed loans and the effect of credit risk on bank performance. The higher the ratio of impaired loans to gross loans, the lower the quality of the bank's loan portfolio, other things being equal. Thus, an increase in the ratio should lead to an increase in the probability of bank distress (Chiaramonte et al., 2015; Growe, DeBruine, Lee, & Maldonado, 2014; Ongore & Kusa, 2013). Other users of impaired loans to gross loans to ascertain the determinants of efficiency, performance and stability include Kirkpatrick et al. (2008), Sufian. (2011), Petria et al. (2015), and Uhde & Heimeshoff (2009).

Management Quality – Cost to Income Ratio (CIR)

The Cost to Income ratio is adopted to show the managerial ability of bank management to properly manage cost against generated income. Put differently, it expresses the capacity of a bank to cover its operational expenses from the income generated. It is defined as the operational cost to operational income. Low values of CIR indicate better managerial quality (Chiaramonte et al., 2015; Roman & Sargu, 2013). Studies who adopted CIR as a proxy for management quality include, Sufian, (2011), Das & Ghosh, (2006), Berger & DeYoung, (1997), Petria et al. (2015), Rashid & Jabeen, (2016), Uhde & Heimeshoff, (2009), and Bourkhis & Nabi, (2013)

Earnings Proxy – Net Interest Margin (NIM)

The Net Interest Margin (NIM) is defined as net interest divided by total earning assets. It is a measure of the difference between interest income generated and the amount of interest paid, relative to the amount of interest-earning assets. NIM is usually expressed as what financial institutions earn on loans in a particular time period in addition to other assets minus the interest paid on borrowed funds divided by the average amount of the assets on which income was earned in that time period (Ongore & Kusa, 2013). More so, NIM measures the gap between interest income accruable to banks based on receipts from loans and securities and interest cost from borrowed funds. Thus, it depicts the cost of bank intermediation activities and consequently, bank efficiency. Therefore, the higher the NIM of a financial institution, the higher is its earning margin. Nonetheless, a high NIM could also reflect deep-rooted risky

lending practices which could translate to substantial loan loss provisions (Khrawish, 2011). Few studies utilise the net interest margin as a proxy for earnings, however Sufian, (2011), Daly & Zhang, (2014), Uhde & Heimeshoff, (2009) adopted NIM to ascertain if it determines efficiency, performance, and financial stability.

Liquidity – Liquid Assets/Deposit & Short Term Funding Ratio (LADSTF)

The importance of liquidity cannot be downplayed in banking as the inability to meet liquidity and funding obligations may lead to failure if external support is not obtained. This covariate measures the ability of banks to continuously use their deposits and short term liquidity position to meet its customer needs and short-term liabilities. It is a deposit run-off ratio and it shows the percentage of customer deposits and short-term funding that could be realised when funds are suddenly withdrawn. And the higher the value of this ratio, the more liquid a bank is said to be and the less vulnerable to a classic run (Bunda & Desquilbet, 2003; Pasiouras, Tanna, & Zopounidis, 2007). Users of the liquid assets to deposit & short term funding ratio include Assaf et al. (2011), Salim et al. (2016), Ghosh, (2015), Flamini et al. (2009), Heffernan & Fu, (2010), Al-Jafari & Alchami, (2014), Almumani, (2013), Ayaydin & Karakaya, (2014), Chiaramonte et al. (2015), and Marques et al. (2013).

Sensitivity to Risk – Total Securities/Total Assets Ratio (TSTA)

The concern of this CAMELS quotient is the impact on banks from shifts and fluctuations in the financial market. Market forces affect the viability of banks. For instance, price movements that favour the portfolio of a bank may positively impact the bank's balance sheet, whereas unfavourable movements may have negative effects on the bank. This proxy shows the relationship between the total securities portfolio of banks and their assets. It provides the percentage change of the portfolio in changes related to interest rates or other issues related to the issuers of the securities. Thus, a low value of the total securities to total assets ratio is an indication that a bank's reaction towards market is appropriate. While a high value of the ratio depicts that the bank's portfolio is vulnerable to market risks (Christopoulos et al. 2011; Mayes & Stremmel, 2012).

Non- CAMELS Ratio: Bank Size – Natural Logarithm of Total Assets

The natural Logarithm of Total Assets is the Non-CAMELS bank-specific variable employed for this study. However, to arrive at the Natural Logarithm, total assets inflation-adjusted values are calculated. The total assets of banks are divided by the yearly (2000-2013) Consumer Price Index (CPI) and then multiplied by 100 before obtaining the Natural Logarithm. More so, 'natural logarithm' is a logarithm to the base of e (2.71828183……). Thus, bank size is defined in this study as the logarithm of total assets to the base of e. Increased bank size is presumed to confer benefits that can improve performance and profitability. Perceived benefits of increased bank size include improved technological efficiency, greater market power, and the capacity to secure funding at a lower cost. Nonetheless, increasing size beyond certain levels may bring about scale inefficiencies as bureaucracy disrupts communication (Growe et al., 2014). Larger banks are more prone to diversification, which could have effects on risk, profitability and decision-making. As a result, the relationship between size and performance may be positive or negative. Due to the ambiguous relationship of size and bank performance in literature and in various financial jurisdictions, size is included as an independent variable in the regression models (Sufian, 2011; Pasiouras & Kosmidou, 2007; Heffernan & Fu, 2008; Tan & Floros, 2013; Ben Naceur & Goaied, 2008; Menicucci & Paolucci, 2016; Koutsomanoli-Filippaki et al., 2009; Fu et al., 2014; Carretta et al., 2015). More so, the wave of bank mergers and acquisitions, in addition to the purchase and assumption transactions that were witnessed in the Nigerian banking industry as a consequence of the banking reforms within the span of the study supports the inclusion of this variable.

Macroeconomic Variable: Gross Domestic Product (GDP)

Economic growth is believed to impact bank performance favourably, through increases in loan demand and decreases in loan default rates while favouring banks to charge higher fees for their services. However, this may be balanced by the increasing supply of banking services, as developments and new bank entrants are motivated by observed favourable conditions. Conversely, literature also depicts that there are several negative ways that in which unfavourable economic cycles affect bank performance. In economic downturns, bank lending is more likely to decelerate, the quality of loans more likely to depreciate, and default risk also more likely to surge (Alam, 2013; Bourkhis & Nabi, 2013; Flamini, Mcdonald, &

Schumacher, 2009; Growe et al., 2014; Heffernan & Fu, 2008; Koetter et al., 2007; Lee & Kim, 2013; Rashid & Jabeen, 2016; Safrali & Gumush, 2012; Uhde & Heimeshoff, 2009). Macroeconomic variables are expected to assume significant importance in our study due to the episode of the global financial crisis that started in the second half of 2007. Hence the real change in gross domestic product (GDP) is incorporated in this study.

Table 4.3: Expected Coefficient Sign of Independent Variables

Variable	Measure	Notation	Expected Sign (Efficiency)	Expected Sign (Performance)	Expected Sign (Stability)
Capital Adequacy	Equity to Total Assets Ratio	ETA	+	+	
Asset Quality	Impaired Loans (NPL) to Gross Loans Ratio	ILGL	-	-	-
Management Quality	Operating Expenses to Operating Income Ratio (CIR)	CIR	-	-	-
Earnings	Net Interest(Interest received – Interest paid) to Total Earning Assets Ratio	NIM	+	+	+
Liquidity	Liquid Assets to Deposits & Short Term Funding Ratio	LADSTF	+	+/-	+/-
Sensitivity to Market Risk Proxy	Total Securities to Total Assets Ratio	TSTA	-	-	-
Bank Size	Natural Logarithm of Total Assets	SIZENLTA	+/-	+/-	+/-
Macroeconomic Variable	Gross Domestic Product Growth	GDP	+	+	+/-

4.8   Justification for Adopting Two Quantitative Techniques

The DEA window analysis and multiple regression analysis are jointly employed in this study due to the reasons below.

DEA window analysis examines the efficiency of individual DMBs, whereas regression analysis aggregates financial ratios of all DMBs to indicate the impact of a range of CAMELS bank-specific variables, size and GDP on efficiency (efficiency scores). Additionally, regression analysis also examines the impact of CAMELS bank specific, size and GDP on bank performance and financial stability. Recent studies have engaged in the second stage analysis of bank efficiency by using efficiency scores as dependent variables (examples include Assaf, Barros, & Matousek, 2011; Chortareas, Girardone, & Ventouri, 2012; Sufian, 2011; Wang, Lu, & Liu, 2014; Wu et al 2016). This makes the examination of efficiency more robust as the regression analysis indicates the determinants of efficiency. More so, the inclusion of additional dependent variables (ROA proxy for bank performance and Z-Score proxy for banking stability) in similar regression models (model 2 and model 3) provides avenues to discover the determinants of bank performance and financial stability. Moreover, the results of the regression models make for interesting comparison.

Furthermore, the employment of the DEA window analysis and multiple regression analysis are complementary. DEA window analysis is based on the moving averages analogue, while regression analysis can be manipulated to account for the effects of independent variables in different periods. Therefore, the results from both techniques are used in this study to shed light on the effects of the 2005 and 2009 Nigerian banking reform on the efficiency, performance, and stability of Nigerian DMBs.

More so, the use of two quantitative techniques increases the reliability of the results of this thesis. As both techniques can be easily replicated, the results obtained in this study can be relied upon. To this end, the validity and reliability of this thesis which adopts two quantitative methods and one qualitative method in a mixed methods research are elaborated upon below.

4.9   Validity and Reliability

4.9.1 Validity

The question that should be asked here is "are we measuring what we think we are measuring?" Kumar (2005) opines that validity is the ability of an instrument to measure what it is designed to measure. Hence, validity is defined as the degree to which the researcher has measured what he or she set out to measure (Denscombe, 2014). To further the definition of validity, Saunders & Lewis (2012) suggest that validity is the extent to which a data collection method or methods accurately measure what they set out to measure and the research findings are really about what they acknowledge to be about. Simply put, validity is concerned with whether research findings are actually about what they seem to be about. Validity is a crucial factor that should be considered in research strategy design. This is owing to the view that various factors can render research findings invalid. Thus, to arrive at valid research conclusions, the factors that threaten the validity of findings must be eliminated (Saunders & Lewis, 2012; Saunders et al., 2012).

Consequently, the principal factors that threaten validity (Saunders & Lewis, 2012) and how this particular study navigates through them in order to draw valid conclusions are presented below:

Subject Selection – This points to the notion that biases may exist as a result of selecting research subjects, which are not representative of the general population. However, in a bid to ensure that the population used in this research are valid and can be used to draw conclusions, this study makes use of data that covers all the institutions involved. The data collected from the Central Bank of Nigeria and the Nigeria Deposit Insurance Corporation have aggregated information of all the commercial banks that operated in Nigeria. This indicates that the information used is a true representation of the general population, and thus valid generalisations can be made. Though it was the desire of this study to interview one individual each from all the twenty-three institutions (twenty-one commercial banks and the two regulatory agencies) presently in existence, only seventeen individuals were eventually interviewed. But to scale down this limitation and increase validity, financial figures covering all the banks still in existence and those that operated in the country before the consolidation reforms of 2005 are examined in this study.

History – Specific events, which occur in the history of the observed phenomenon, may have a significant effect on research findings. Due to the effect of such events, the research strategy employed should be able to incorporate the history. Accordingly, in order to ensure validity, the scope of this study is fourteen (14) years (2000 – 2013). The periods before and after the 2005 banking reforms, the 2009 banking reforms, the global financial crisis that started in the second half of 2007, and the periods before some banks were nationalised and transformed into bridge banks are all covered within the scope of the study. All these events that are perceived to have some impact on the performance of banking institutions are discussed in this study and interview questions solicited answers, which sought to bring to light the effects of these events.

Testing – This factor suggests that the process of collecting data may have effects on the subjects. For instance, respondents may try to impress the interviewer, and in the process, stray from providing valid responses. In relation to this study, responses were only obtained from seasoned, experienced bankers who had no reason to impress the interviewer because they acted in positions of trust and had their reputation and those of their institutions to protect. More so, the information collected from regulatory documents, the financial stability reports of the CBN and the annual reports of the NDIC are documents that were carefully prepared because of the audience. Likewise, the data obtained from the BUREAU VAN DJIK Bankscope database are adaptations from original bank financial statements, and this database is renowned to be used for academic and professional research. Thus, to ensure the validity of this study, only trusted data sources as mentioned have been used.

Mortality – This is mainly an important issue for the conduct of longitudinal research if it happens that the research subject is lost. However, institutions matter in this particular study but not individuals. Even though some banks ceased to exist during the period covered, their non-existence is integral to this study.

Furthermore, validity can be viewed under two perspectives (internal and external validity). The factors discussed above are predominantly viewed as internal validity. External validity refers to the extent to which conclusions are generalizable under different research settings. This dwells on whether the institutions used can be relied upon to guarantee generalisations. The concern of this research is to x-ray the regulatory terrain in the Nigerian banking sector, and it does not make recommendations that should exactly fit into the scope of another banking sector. However, the generalisations made can be used as a reference source

especially to developing countries in Africa, while the methods employed can be adopted to be applied in other jurisdictions (Heukelom, 2009; Saunders & Lewis, 2012).

4.9.2 Reliability

When a research tool is consistent and stable, for this reason, predictable and accurate, it is said to be reliable. As a result, the greater the degree of consistency and stability of a method, the greater is its reliability (Kumar, 2005).

Equally, for a research to be reliable, it must adopt data collection methods and analysis procedures, which are bound to produce consistent findings. The consistency referred to points to the degree to which the questions below can be answered:

- Will the measures used produce the same results if used on other occasions?
- Will other researchers' produce the same results if they adopt the same methods and procedures?
- Will those interpreting the research clearly understand how conclusions were drawn from the data collected (Saunders & Lewis, 2012)?

The adopted research strategy, data collection methods, and analysis techniques were carefully chosen to ensure reliability. In answering the questions above, the responses obtained from interviewees even though from different banks provided similar results. Thus, using the same research questions to obtain responses from different interviewees (experienced bank executives) will generate the similar results. More so, the technique used to analyse data (content analysis, DEA window analysis, and multiple regression analysis) can be replicated. While enumerating the strengths of content analysis, Vitouladiti (2014), suggested that establishing reliability is easy and straightforward. Whereas, the DEA window analysis technique will reveal the same results as long as the same input and output variables are used to examine the efficiency of banking institutions. Equally, the multiple regression analysis carried out will present the same results as long as the same variables and tests are employed. As already discussed in the literature chapter, the techniques utilized for analysing data have been used severally in the estimation of bank performance. Hence results and findings obtained via the utilization of the DEA window analysis and multiple regression

analysis can be relied upon. Additionally, the conclusions to be drawn in this study will be able to be understood in line with the collected data.

Conclusively, proponents of mixed research methods of which this study adopts are of the view that triangulation leads to thicker and richer data and complementary data analysis techniques which ensure validity and reliability (Onwuegbuzie et al., 2011).

4.10   Chapter Conclusion

This chapter centered on the comprehensive presentation of the procedures adopted to achieve the aims and objectives of this study. The philosophical stand of the research study; the adopted research approach; the appropriate research strategies; the research study period; and the data collection and analysis techniques employed in this study were examined in this chapter. In summary, this research leans towards the pragmatic paradigm as it relies on elements of both the positivist and interpretivist in order to answer the research questions. In like manner, the abduction research was also discussed as the preferred research approach as it seesaws between induction and deduction in order to achieve the aims and objectives of the study. Progressively, the chapter also highlighted triangulation of data collection methods as qualitative and quantitative research strategies were employed to obtain data for analysis. Furthermore, presentations that center on the three data analysis techniques were made. Firstly, content analysis is used in this study to analyse interview responses and regulatory documents. Secondly, DEA window analysis which is anchored largely on either the CCR model (constant returns to scale assumption) and the BCC model (variable returns to scale assumption) are comprehensively discussed, before indicating that the BCC efficiency scores are relied upon instead of the CCR efficiency scores due to the inability of the CCR model to identify scale effects. Thirdly, panel data variant of multiple regression estimations is used to ascertain the relationship between the dependent variables proxies of bank efficiency, bank performance, and bank stability, and the independent variables proxies of capital adequacy, asset quality, management quality, earning capacity, liquidity, sensitivity to market risk, bank size, and GDP. Finally, the validity and reliability of this are justified to round up the chapter.

Chapter Five: DEA Window Analysis Technique

5.1 Introduction

This chapter dwells on the analysis of the performance of Nigerian DMBs based on efficiency scores obtained through the utilisation of the DEA window technique. As mentioned in previous chapters of this thesis, the DEA window method measures the performance of a DMU against other DMUs and itself within a particular window. Therefore, the performances of Nigerian Deposit Money Banks (DMBs) are analysed in twelve windows (window 1 – window 12) to ascertain the effects of the 2005 and 2009 banking reforms, and the global financial crisis on efficiency. Put differently; this chapter examines efficiency scores based on the inputs and output relationship influenced by the 2005 and 2009 banking reforms, the event of the global financial crisis, the bailout strategy and the bridge banking mechanism. Therefore, the performance of Nigerian Tier I (big DMBs) and Tier II (medium & small sized DMBs), bailed-out DMBs, and bridge banks are x-rayed within the period of 2000 - 2013.

As presented and discussed in the literature and methodology chapters of this study, the basic DEA models are based on two broad assumptions i.e. the constant returns to scale (CCR) and the variable returns to scale (BCC). This study initially set out to ascertain the efficiency of Nigerian banks based on the calculated CCR and BCC efficiency scores for the period of 2000 to 2013. However, this section relies primarily on the BCC efficiency scores to draw conclusions owing to the similarity in the pattern of efficiency scores. More so, due to the premise that CCR indicates the overall technical efficiency (OTE) of banking institutions, while BCC is more comprehensive as it decomposes overall technical efficiency (OTE) into pure technical efficiency (PTE) and scale efficiency (SE). The BCC model estimates whether organisations are operating under increasing, decreasing or constant returns to scale. Therefore, the BCC model is picked over the CCR model in the assessment of the efficiency of Nigerian DMBs.

Consequently, BCC efficiency scores obtained from the interaction of Nigerian DMBs inputs (interest expenses, non-interest expenses, and total deposits) that produced outputs (interest income, non-interest income, and total loans) are trusted in the evaluation of the performance

of individual DMBs and classes of DMBs in the Nigerian banking sector from 2000 – 2013. The analysis of the efficiency scores of DMBs, therefore, shows the extent to which the initiatives and strategies of Nigerian regulators influenced inputs and output production.

In addition, the similarity in the slope of the aggregate efficiency scores of both the CCR and BCC models as depicted in the diagram below affirms the position of the study to rely on the efficiency scores of one out of the two models.

Figure 5.1 BCC and CCR Aggregate Average Efficiency Score
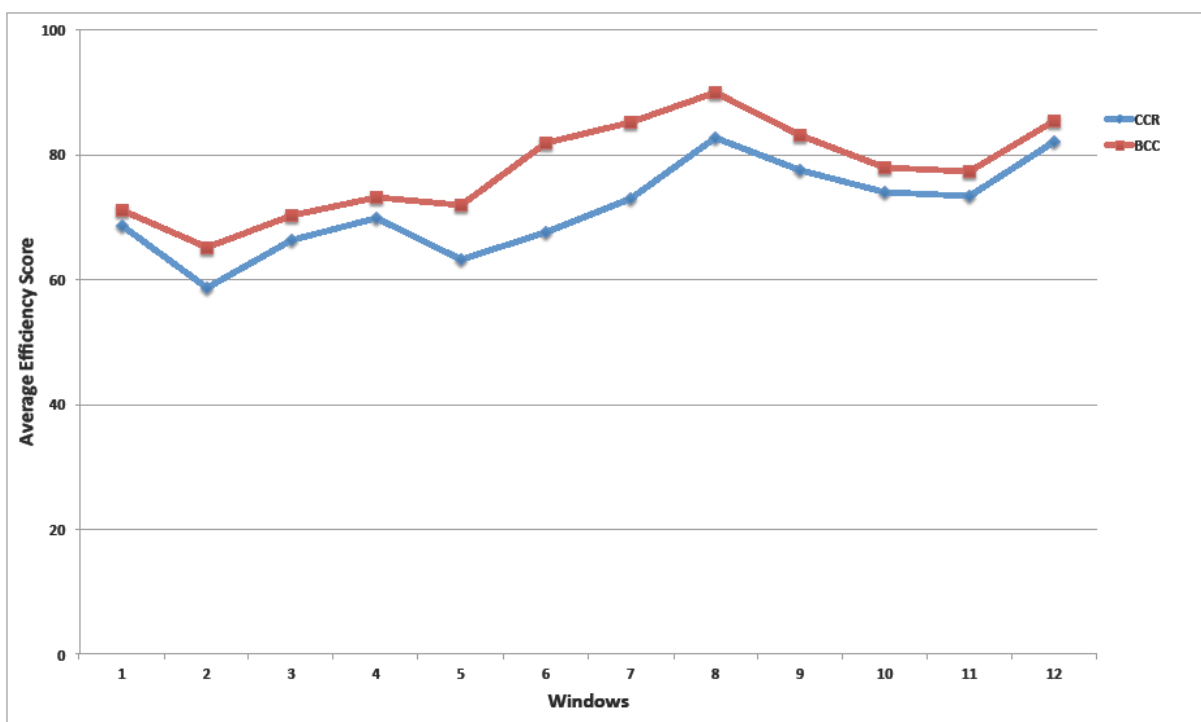
The superior slope of the BCC is an indication that the BCC (VRS) efficiency scores are higher than the CCR (CRS) efficiency scores. Hence, when the results of the BCC model are compared against those of the CCR model, the DMUs under the BCC model show higher degrees of efficiency, although there are instances where they are the same. Therefore, the number of efficient banks (DMUs), the percentage of efficient banks, and the average efficiency score under the BCC model are higher than those of the CCR model.

Although the efficiency scores under the constant returns to scale assumption (CCR) are not discussed in conjunction with the adopted variable returns to scale assumption model (BCC),

the CCR efficiency scores are presented in the appendix section to validate the conclusions of the study. In addition, the CCR efficiency scores are attached to increase the robustness of our results. Likewise, only the BCC efficiency scores are used as dependent variables in the estimation of the effects of bank-specific CAMELS variables, size and GDP on efficiency.

5.2   Banker – Charnes – Cooper (BCC) Model

As depicted above, the BCC model relies on the variable returns to scale assumption. Therefore, the efficiency of Nigerians DMBs are measured using different returns to scale (increasing, decreasing or constant returns to scale). This section dwells on the analysis of the BCC efficiency scores.

The table below is a summary of the BCC model analysis, and it shows the number of DMBs in each window, the number of DMUs or observations, the number of efficient and inefficient DMUs, the percentage of efficient and inefficient DMUs, and the average efficiency score of DMUs in each window.

Table 5.1: BCC Outcome

Windows	1	2	3	4	5	6	7	8	9	10	11	12
Years	2000 – 2002	2001 – 2003	2002 - 2004	2003 - 2005	2004 - 2006	2005 - 2007	2006 - 2008	2007 - 2009	2008 - 2010	2009 - 2011	2010 - 2012	2011 - 2013
No. of Banks	75	73	70	62	40	29	24	23	23	25	24	20
No. of DMUs	187	186	163	127	89	72	65	64	63	63	61	60
Efficient DMUs	21	14	13	20	22	21	21	26	18	16	18	23
Inefficient DMUs	166	172	150	107	67	51	44	38	45	47	43	37
Efficient DMUs	11.23%	7.53%	7.98%	15.75%	24.72%	29.17%	32.31%	40.63%	28.57%	25.4%	29.51%	38.33%
% of Inefficient DMUs	88.77%	92.47%	92.02%	84.25%	75.28%	70.83%	67.69%	59.38%	71.43%	74.6%	70.49%	61.67%
Average Efficiency Score	71.04%	65.07%	70.15%	73.07%	71.85%	81.83%	85.1%	89.83%	82.92%	77.91%	77.23%	85.26%

5.3   Window 1: BCC (2000, 2001, and 2002)

The table above shows that 75 DMBs with data translated to 187 DMUS or observations in window 1 in line with the three-year window size adopted for this study. The results revealed 21 efficient DMUs and 166 inefficient DMUs. Thus, 11.23% of the DMUs are efficient, while 88.77% are inefficient. The lowly 11.23% is a poor showing for the Nigerian banking sector, in particular for a period that consists of 187 DMUs. The average efficiency score of 71.04% is 28.96% less of the efficiency mark of 100%. Therefore, in line with the principles of DEA, the aggregate performance of Nigerian DMBs in window 1 is not good enough to be tagged as efficient.

The table below shows efficient Nigerian DMBs that were at least efficient in one of the three years in window 1.

Table 5.2: Window 1 List of Efficient DMUs (DMBs)

Efficient Banks	2000	2001	2002
CitiBank Nigeria	✓	✓	✓
First Bank			✓
Skye Bank			✓
IBTC Bank		✓	✓
Sterling Bank			✓
Manny Bank	✓		
Bank of the North	✓		✓
Assurance Bank		✓	
Cooperative Dev			✓
Centre-Point Bank		✓	
National Bank	✓	✓	
Lead Bank		✓	✓
NUB Bank		✓	
Fortune Bank			✓
Indo-Nigerian Bank	✓		

Regarding the performance of individual DMBs within window 1, 15 DMBs were efficient in at least one of the three years covered. Table 5.2 indicates that Citibank was the most efficient DMB with efficiency scores of 100% in all the three years. IBTC Bank, Bank of the North, National Bank and Lead Bank were all efficient in two years within the window. And the remaining banks on the table were only efficient in a year each within the window.

Based on the classes of the efficient DMUs, Table 5.2 consist of mostly small-sized DMBs. The large presence of small banks on the efficiency frontier is an indication that small banks in Nigerian within the period of 2000 to 2002 made better use of their inputs. Therefore, suggesting most of the large banks were not efficient in the utilisation of inputs at their

disposal. However, the only exceptions to the lax performance of large banks within window 1 are First Bank and Bank of the North. Bank of the North was efficient in 2000 and 2002, whereas First Bank was only efficient in 2002. The fact that Bank of the North and First Bank are the only big banks on Table 5.2 highlights the superior performance of small DMBs over large DMBs in window 1 of this study. In addition, apart from Oceanic Bank which had an efficiency score of 93.27 in 2001 in window 1, the efficiency scores of big banks like GTB, Union Bank, Intercontinental Bank and Zenith Bank were below 90% in all three years. More so, some big banks had efficiency scores that were below 50% in some years in window 1. For example, Afribank had an efficiency score of 48.4 in 2000, while UBA had an efficiency score of 46.67 in 2001. As such, these results suggest that large DMBs were inefficient within window 1.

Conversely, though small DMBs operating in Nigeria are depicted to have more DMUs on the efficiency frontier, some the small DMBs had efficiency scores that were below 50% within the window. The small-sized DMBs with efficiency scores below 50% include: Metropolitan Bank which had an efficiency score of 36.06 in 2000; Broad bank had an efficiency score of 31.52 in 2001; NNB International Bank had an efficiency score of 39.35 in 2002; Societe Generale bank had efficiency scores of 40.58 and 36.75 in 2000 and 2001; Platinum bank had efficiency scores of 44.41and 40.2 in 2001 and 2002; Fountain bank had efficiency scores of 39.28 and 37 in 2001 and 2002; and Fidelity Bank had an efficiency score of 39.81 in 2001. Though there are more small DMBs with efficiency scores that are below 50%, it should also be noted that the number of small DMBs outweighs the number of large banks in the Nigerian banking sector. Hence, the BCC efficiency scores suggest that the performance of small-sized DMBs showed conflicting results, with some exhibiting excellent efficiency scores, while others produced unsatisfactory scores.

Furthermore, the efficiency scores of NUB international bank present an unusual position. NUB International bank was on the efficiency frontier with a score of 100 in 2001 but plunged to 23.68 in 2002. The performance of NUB indicates that the performance of a banking institution can radically change within one year. Thus suggesting the regular assessment of banks to mitigate against sharp decreases in efficiency levels.

Additionally, the foreign DMBs with operations in the Nigerian banking sector in the pre-2005 era include Citibank, Ecobank Nigeria, Indo-Nigeria Merchant Bank, Centre-Point Merchant Bank, NBM Bank, Regent Bank, Reliance Bank, Standard Chartered, and Stanbic

Nigeria. Three foreign banks are at least efficient in one year within the window (Citibank, Centre-Point bank, and Indo-Nigerian bank). Citibank is the most efficient DMB in window 1 with 100% efficiency scores in all the years. Therefore, suggesting mixed results in the performance of foreign DMBs in the Nigerian banking sector within the window. The limited amount of foreign DMBs in the Nigerian banking sector does not make an accurate comparison between local and foreign DMBs. A review of the foreign DMBs within the window reveals that most of the efficiency scores range from 50% to 90%. Hence given the performance of small local DMBs within the window, there are more local Nigerian DMBs with efficiency scores below 50%, as Reliance Bank is the only foreign DMB with an efficiency score that is below 50% (43.53 in 2002).

In conclusion, small-sized DMBs dominate the efficiency frontier of window 1, while the most efficient DMB in the Nigerian banking sector is a foreign DMB (Citibank). Also, large DMBs are sparsely represented on the efficiency frontier as only two large DMBs (3 DMUs) are on the table of efficient DMUs (DMBs).

5.4   Window 2: BCC (2001, 2002, and 2003)

73 banking institutions with a total of 186 DMUs are examined in window 2. 14 out of the 186 DMUs in window 2 are efficient whereas 172 are inefficient. Therefore, the proportion of efficient DMUs stood at 7.53%, while the remaining 92.47% of the DMUs were inefficient. When compared to the results of window 1, the results of window 2 reveal an aggregate fall in the efficiency level of Nigerian DMBs. Equally, the average efficiency score in window 2 plummeted to 65.07% by 5.97% from that of window 1. Despite the fact that the performance of this window was worse than that of window 1, it has the same conclusion. Nigerian DMBs when compared to themselves and their peers in the years, 2001, 2002, and 2003 indicate that the summative performance of the banking sector was also inefficient.

Table 5.3: Window 2 List of Efficient DMUs (DMBs)

Efficient Banks	2001	2002	2003
CitiBank Nigeria	✓		✓
First Bank		✓	✓
Skye Bank		✓	
IBTC Bank	✓	✓	✓
Bank of the North		✓	
Assurance Bank	✓		
Centre-Point Bank	✓		
National Bank	✓		
NUB Bank	✓		
Fortune Bank		✓	

The number of efficient DMBs and in general DMUs plummeted in window 2. The most efficient DMB in this window is IBTC Bank because it is efficient in the three years of the window. IBTC was efficient in 2001 and 2002 in window 1, therefore its efficiency in all the three years examined in this window signify sustained performance. Consequently, IBTC replaced Citibank as the most efficient bank. And it can be seen from the table above that Citibank is efficient in two years (2001 and 2003) within window 2. However, it is not efficient in 2002 even though it was efficient in the same year in window 1. Thus indicating that the most efficient frontier in the analysis has changed and the performance of Citibank in 2001 and 2003 was better than the performance of the bank in 2002, even though the efficiency score of 2002 was good enough to be on the efficiency frontier in window 1. Therefore, suggesting that the performance of Citibank dropped in 2002 before picking up again in 2003.

Furthermore, given the performance of foreign banks in window 2, Citibank and Centre-Point bank are the only foreign banks to make it to the efficiency frontier. As mentioned above,

Citibank is efficient in 2001 and 2003 (i.e. is two years). It was the most efficient bank in the Nigerian banking sector in window 1 according to the BCC efficiency scores obtained. However, it can only be viewed as the most efficient foreign bank in window 2, as IBTC bank revealed perfect efficiency scores in all three years in the window. Whereas Centre-Point bank maintained its 2001 efficiency score of window 1 in window 2, but the absence of data for subsequent years derailed the further assessment of the performance of Centre-Point bank in this study. In the light of the general performance of foreign DMBs in the Nigerian banking sector, the results obtained reveal the limited presence of foreign DMBs on the efficiency frontier. More so, the efficiency scores of the foreign DMBs were not superior to those of Indigenous Nigerian DMBs.

Simultaneously, only two of the large Nigerian DMBs are on the table of efficient DMUs (DMBs) within window 2. First Bank is efficient in two years (i.e. 2002 and 2003) in this window is First Bank, while Bank of the North is efficient in 2002. The result of First Bank in this window is an improvement on its performance in window 1, as it was only efficient in one year within window 1. The absence of Bank of the North disclosed financial statements hindered further analysis of the performance of the bank in this study. However, the bank merged with other banks in 2005 during the consolidation exercise of the 2005 Nigerian banking reforms. In sum, the limited presence of large DMBs on the efficiency frontier continued in window 2. The performance of the large DMBs hovered around 50% to 90% just like most of the other banks in the Nigerian banking sector. Thus the performance of the large DMBs within window 2 did not stand out.

Moreover, a look at the table of efficient DMUs (DMBs) indicates that there were more efficient small deposit money banks. Nonetheless, the efficiency level of the smaller DMBs within the window is not significant as the performance of DMBs in the entire banking sector was worse than the performance of window 1. However, given the principles of DEA, it is possible that the reduced number of efficient DMUs (DMBs) in window 2 was due to the increased efficiency of the efficient frontier of within the window.

More so, Nigerian banking regulators increased regulatory capital from N500 million to N1 billion for existing DMBs, and from N1 billion to N2 billion for new DMBs in 2001. The efficiency level of DMBs increased in 2001 in window 1, although there were more efficient DMUs in 2002. In like manner, the performance of DMBs in 2001 was superior to the performance of DMBs in 2002 and 2003. Thus the result obtained in 2001 might be

connected to the capital increase. More so, the reduced number of efficient DMBs in 2002 and 2003 suggests that efficiency level increases immediately capital is injected in Nigerian DMBs, but such surges in efficiency levels are not sustained. Also, the number of efficient DMBs in 2002 and 2003 also suggest that the efficiency of Nigerian DMBs is not dependent on capital regulation and capital requirement.

5.5   Window 3: BCC (2002, 2003, and 2004)

Window 3 consists of 70 DMBs and 163 DMUs, analysed in the years 2002, 2003 and 2004. Owing to the three-year window size adopted in this study, 2002 is the first year to appear in all three windows thus far. The performances of banks in 2000 are only examined in window 1, while the performances of banks in 2001 are examined in window 1 and window 2. The results showed 13 efficient DMUs out of 163. Therefore, 150 out of the 163 DMUs examined in window 3 were inefficient. The percentage of efficient DMUs stood at 7.98%, while that of the inefficient DMUs was 92.02%. However, even though window 2 had more efficient DMUs, a slight positive movement in the percentage of efficient DMUs in window 3 was noticed. In the same manner, the average efficiency score witnessed a growth of 5.08% to tally up at 70.15% in this window. Conversely, though a positive movement occurred in the aggregate efficiency score of the Nigerian banking sector, the performance of the Nigerian banking sector was inefficient in line with the principles of the DEA methodology.

Table 5.4: Window 3 List of Efficient DMUs (DMBs)

Efficient Banks	2002	2003	2004
CitiBank Nigeria		✓	
First Bank	✓	✓	✓
Guaranty Trust Bank			✓
Skye Bank	✓		
IBTC Bank	✓	✓	
Wema Bank			✓
Manny Bank			✓
Bank of the North	✓		
Fortune Bank	✓		
Co-operative Bank		✓	

Dwelling on the particular performance of individual DMBs in window 3 under the BCC model, First Bank is the only bank to be efficient in all the three years. Thus First Bank is the most efficient bank in window 3, and this is also the first time a big bank is the most efficient bank in any particular window. The performance of First Bank is an improvement on its performance in window 2, as it moved from being efficient in 2 years to being efficient in all 3 years in this window.

More so, this window witnessed an increase in the number of big banks on the efficiency frontier with GTB joining First Bank and Bank of the North on the table of efficient DMUs (DMBs). The results show GTB to be efficient in 2004 which is an increase on the 2002 and 2003 of the bank. The surge in the performance of GTB was not marked by any significant event in the Nigerian banking sector, although the surge could be associated to the pronouncement of 2005 banking reforms on July 6, 2004.

Furthermore, apart from First Bank, IBTC is the only DMB to the efficient in two years in window 3, as all the other banks on the table have efficiency scores of 100% in not more than

one year each. IBTC was the most efficient DMB in window 2, but its efficiency score of 85.57 in 2004, ensured it lost its position as the top bank according to the BCC efficiency scores.

With the change in the years examined in every window, Citibank, which was efficient in two years in window 2, was only efficient in one year (2003). A look at the table of efficient DMUs (DMBs) reveals that Citibank is the only foreign DMB on the efficiency frontier within window 3. Thus suggesting the performance of foreign DMBs in Nigeria within window 3 are not superior to those of indigenous DMBs.

Progressively, apart from the few big banks and the sole foreign DMB on the table of efficient DMUs (DMBs), the other efficient DMBs on the efficiency frontier are the smaller Nigerian DMBs. Thus given the classification of banking institutions in the Nigerian banking sector, medium or small DMBs are more efficient in the utilisation of their inputs.

5.6   Window 4: BCC (2003, 2004, and 2005)

Following the announcement of the commencement of the banking reform programme that culminated on 31 December 2005, banking institutions embarked on various capital raising initiatives within this window. For that reason, the number of money deposit banks examined in this window reduced to 62, which then amounted to 127 DMUs. The number of efficient DMUs under the BCC model increased to 20, with the inefficient banks amounting to 107. As such, the percentage of efficient DMUs stood at 15.75%, with the remaining 84.25% being inefficient. In like manner, the average efficiency score increased to 73.07% (window 4) from 70.15% (window 3). Therefore, the average efficiency score of 73.07% suggest that the Nigerian banking sector is inefficient.

Table 5.5: Window 4 List of Efficient DMUs (DMBs)

Efficient Banks	2003	2004	2005
CitiBank	✓		✓
First Bank of Nigeria	✓	✓	✓
Guaranty Trust Bank			✓
IBTC Bank	✓		✓
UBA			✓
Wema Bank		✓	✓
Zenith Bank			✓
Oceanic Bank			✓
Intercontinental Bank			✓
Manny Bank		✓	
Chartered Bank		✓	
National Bank		✓	
Lead Bank	✓		
Fortune Bank	✓		
Co-operative Bank	✓		

A look at the table above shows that 6 DMUs are efficient in 2003, while 5 DMUs are efficient in 2004. The year 2005 has the highest number of efficient DMUs with nine (9) efficient DMUs within the window. Therefore, the capital requirement increase of the 2005 banking reforms might have probably led to the increased number of DMUs within the window and in the year 2005 to be particular.

Just as in window 3, First Bank is efficient in all the three years of the window, thus it retains its position as the most efficient DMB in window 4 according to the BCC efficiency scores.

First Bank is a large Nigerian DMB (Tier I), and it can be seen from the above table that the number of large DMBs on the efficiency frontier has increased. The increase in the number of efficient DMBs is visible in 2005. The 2005 banking reforms mandated DMBs to increase their regulatory capital to N25 billion before the end of 31 December 2005. Some DMBs simply raised capital from the capital market, while most banks merged or were acquired before they raised additional capital through the capital market. Thus a host of banking institutions seized to exist. The DMBs that emerged after the 2005 banking reforms are listed in Appendix 8.

The small or medium-sized DMBs dominated the efficiency frontier in 2003 and 2004, while the big banks dominated in 2005. The BCC efficiency scores indicate that more DMBs in the window were efficient in 2005 compared to 2003 and 2004, thus suggesting that the 2005 banking reforms had positive effects on the performance of Nigerian DMBs.

Furthermore, the consolidation exercise of the 2005 banking reforms affected Nigerian DMBs in different ways. To ascertain the effects of the reforms on the performance of DMBs, this study will rely in large part on the scenario presented by the banks on the table of efficient DMUs (banks) above. The results show that Lead bank was efficient in 2003 in window 4 but its performance dipped to 96.57 in 2004. Afribank acquired Lead bank due to the inability of the bank to raise additional capital to meet the N25 billion minimum capital base. Although Afribank was considered a big bank, the acquisition of Lead Bank did not lead to a significant increase in the efficiency score of the bank, as the 2005 efficiency score of Afribank for window 4 stood at 68.39. This scenario reveals that bank acquisitions do not necessarily translate into efficiency.

In the case of Fortune bank, even though it was efficient in 2003 and the efficiency scores of the bank in previous windows ranged between 70 and 100, the bank was unable to raise additional capital to meet the minimum capital requirement. Consequently, it was liquidated by the NDIC in 2006.

Similarly, Co-operative Bank had an efficiency score of 100 in 2003. It merged with Prudent Bank, EIB International Plc, Bond Bank, and Reliance Bank to form Skye bank after the 2005 banking reforms. Prudent Bank was only efficient in the year 2002 in window 1 to window 3. While Reliance Bank, Bond Bank and EIB International Bank were not efficient in any of the windows and years, they had data before the merger. Given the efficiency of the resulting DMB, the merger did not translate into healthier efficiency levels. Thus, suggesting

that the consolidation exercise of the 2005 banking reforms did not lead to improved efficiency levels.

Manny bank was one of the banks acquired by Fidelity Bank, alongside FSB International Bank. Even though Manny bank was efficient in 2004 within window 4 before the deadline of the 2005 banking reforms, its merger with Fidelity Bank did not make Fidelity Bank 100% efficient. However, the merger led to a surge in the efficiency score of Fidelity Bank within the window, as efficiency increased from 62.52 in 2004 to 82.83. The results of Fidelity Bank in this window is an indication that the consolidation exercise of the 2005 banking reforms had a positive effect on the efficiency of some DMBs.

Chartered Bank was for the first time efficient (efficiency score of 100) in any of the windows examined thus far. Its efficiency score of 100% in 2004 (window 4) was a slight increase from its 2003 efficiency score of 91.63. However, the efficiency score plunged to 93.98 in 2005. Although it can be posited that the declining efficiency score was due to the preparation for the merger of the bank with IBTC bank which happened at the end of 2005. More so, IBTC Bank which merged with Chartered Bank had an efficiency score of 100 in 2005. The impact of the merger on the performance of the resulting bank is examined in window 5 when the bank became IBTC Chartered Bank.

Furthermore, National Bank, which was efficient in 2004, merged with Wema Bank in 2005. The results obtained reveal that Wema Bank was efficient in 2005. Consequently, suggesting that the consolidation exercise of the 2005 banking reforms had a positive impact on the performance of the new Wema bank.

The performance of large DMUs (Tier I) in the Nigerian banking sector improved in 2005 as depicted in the table of efficient DMUs (DMBs) above. Apart from First Bank that is the most efficient bank within the window and is efficient in all the three years, all the other large DMBs (GTB, UBA, Zenith Bank, Oceanic Bank and Intercontinental Bank) on the table of efficient DMUs are only efficient in 2005. First Bank merged with FBN Merchant Bankers and MBC International Bank. Hence, the 100% efficiency score of First Bank in 2005 opines that the merger of the DMB with different DMBs did not impact negatively on the efficiency scores of the DMB as it maintained its efficiency level.

In the same vein, UBA merged with Standard Chartered Bank and Commercial Bank but retained the name UBA. All the three banks that merged to make up the new UBA were

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individually not efficient according to the DEA efficiency frontier technique in any of the windows examined before this window. The merger further consolidated the position of the DMB as one of largest DMBs in Nigeria. Therefore, the 100% efficiency score of the bank in 2005 is an indication of the positive impact of the 2005 banking reforms. Given the inputs employed to ascertain the efficiency of banking institutions in Nigeria, the surge in the performance of UBA in the merger year could be down to increased deposits that accrued to the bank due to the increase in branch network and customer base. Also, the surge in efficiency scores could be down to the increased regulatory capital. Nonetheless, although all the banks that survived the 2005 banking reforms had N25 billion or more as regulatory capital, the 2005 efficiency scores suggest only nine DMBs were efficient. Hence, signifying that surviving DMBs reacted differently to the new capital base and size due to the various mergers and acquisitions that might have overwhelmed some institutions.

Oceanic Bank acquired International Trust Bank, while Intercontinental Bank merged with Global Bank, Equity Bank, and Gateway Bank. Both Oceanic and Intercontinental Bank were not efficient in any of the examined windows, and they were not efficient in any of the years before 2005. Therefore, it can be posited that the increase in regulatory capital and the increased bank size, branch network and customer base of Oceanic Bank and Intercontinental Bank which was fostered by the event of the 2005 banking reforms led to the efficiency of the DMBs in 2005.

Additionally, GTB and Zenith bank were not involved in any mergers and acquisitions but witnessed improved efficiency levels in 2005, as depicted in Table 5.4. The presence of GTB and Zenith Bank on the efficiency frontier is most likely due to the increased regulatory capital; however not all the surviving banking institutions were efficient in 2005 within the window. Consequently, the efficiency of Nigerian DMBs is not hinged on capital requirement.

Citibank is the only foreign bank on the table of efficient DMUs (DMBs), and it is efficient in 2003 and 2005. The number of foreign DMBs dwindled in 2005 during the 2005 banking consolidation exercise as bigger Nigerian banks acquired some of them (Appendix 8). Been a member of the American Citi group, Citibank met the minimum capital requirement without merging with other Nigerian DMBs. Thus the bank was not weighed down by the rigours of merging with another bank, which could in addition to the increased regulatory capital be responsible for the 100% efficiency in 2005.

In conclusion, the results suggest that the 2005 banking reforms enhanced the efficiency of Nigerian DMBs, even though different DMBs reacted differently to the mergers and acquisitions that transpired during the consolidation exercise of the reforms. The large DMBs reacted positively to the reforms as they dominated the efficiency frontier in 2005. Additionally, the numbers of foreign DMBs on the efficiency frontier were limited as Nigerian DMBs became bigger, although some of the foreign DMBs merged with indigenous Nigerian DMBs during the consolidation exercise.

5.7   Window 5: BCC (2004, 2005, and 2006)

The years examined in this window are integral to achieving the aims and objectives of this study. Although the number of DMUs decreased because of the consolidation exercise of the 2005 banking reforms, the number of efficient DMUs positively increased to 22, while the number of inefficient DMUs conversely fell to 67. In like manner, the percentage of the efficient DMUs amounted to 24.72%, with the percentage of inefficient DMUs totalling up to 75.28%. Though the number of efficient DMUs increased and translated to an increase in the proportion of efficient DMUs, the average efficiency score plunged to 71.85%. The drop in the average efficiency score indicates that although a larger number of banks were efficient in this window; other DMUs within the window had inferior efficiency scores that pulled down the efficiency level of the window. In a similar vein, the aggregate efficiency scores of all the banks in the window just like in previous Windows signifies inefficiency.

Table 5.6: Window 5 List of Efficient DMUs (DMBs)

Efficient Banks	2004	2005	2006
Access Bank			✓
CitiBank Nigeria		✓	✓
First Bank	✓	✓	✓
IBTC Bank	✓	✓	✓
Standard Chartered			✓
Stanbic Bank Nigeria			✓
UBA		✓	✓
Wema Bank		✓	✓
Zenith Bank		✓	✓
Oceanic Bank		✓	✓
Intercontinental Bank		✓	✓
National Bank	✓		

The table above shows that 2006 is the most efficient year in the window as it has 11 efficient DMUs. DMUs in 2005 are more efficient to DMUs in 2004, as 2005 has eight efficient DMUs, whereas 2004 has only three DMUs. The 2006 efficiency scores indicate that there was an improvement in the performance of banking institutions when compared with the efficiency scores of 2004 and 2005. Therefore, the efficiency scores of this window reveal that the 2005 banking reforms had a positive impact on the performance of DMBs.

The table above shows that two DMBs (First Bank and IBTC Bank) had efficiency scores of 100% in all three years of the window (6 DMUs). First Bank maintained its performance in this window, as it was the only bank with 100% efficiency scores in all three years in window 4. IBTC bank was efficient in 2 years (2003 and 2005) within window 4; however, the results of window 5 show that IBTC was efficient in 2004. The performance of a DMB is measured in every window without consideration to the performance of the same DMB in other windows. Hence, the parameters for comparison must have changed as the efficiency frontier in every window differs in line with the principles of the DEA window technique. As such,

the change in the efficiency frontier of window 5 led to the efficiency of IBTC bank in 2004. More so, the results of IBTC in this window suggest that its merger with Chartered Bank to become IBTC Chartered Bank was beneficial as the DMB continued to be efficient even as other DMBs were trying to get their acts together following the consolidation exercise of the 2005 banking reforms.

Apart from First Bank and IBTC Bank, National Bank is the only other efficient bank in 2004 in window 5. Manny bank, Chartered bank, and Wema bank were efficient in 2004 in window 4; however, the results of this window showed that they are not on the efficiency frontier for the same period. Therefore, the efficiency level of Manny bank, Chartered bank, and Wema bank in 2004 fell below the efficiency frontier when compared against more efficient DMUs in 2005 and 2006. Furthermore, National Bank is the only bank that did not survive the consolidation exercise on the table of efficient DMUs.

As presented in the previous window, Wema Bank acquired National Bank during the consolidation exercise, which could be responsible for the efficiency of the bank in 2006 even though Wema bank was also efficient in 2005 within window 5. As a result, the performance of Wema Bank in 2006 is commendable as it was able to muster an efficiency score of 100 immediately after its merger with National Bank. In like manner, the performance of Wema Bank highlights the positive effect of the 2005 banking reforms.

Additionally, Zenith Bank, UBA, Oceanic bank, and Intercontinental bank improved on their window 4 performances in this window as they are all efficient in 2 years (2005 and 2006) in this window. The efficiency scores of these big banks and those of First Bank in the entire window and the 2006 efficiency score of Access Bank highlights the positive effect of the 2005 banking reforms on the performance of large DMBs and the banking sector in general.

Conversely, GTB had an efficiency score of 100 in 2005 in window 4 but was not on the efficiency frontier in either 2005 or 2006 of window 5. The efficiency scores of GTB dropped to 99.05 in 2005, and further fell to 95.61 in 2006. The slight decline of the 2005 efficiency score of GTB in this window is an indication that the other DMBs on the frontier are more efficient when compared to the performance of GTB. Similarly, a host of DMBs just like GTB had their efficiency scores below 100% in window 5. The DMBs that survived the banking consolidation reforms with efficiency scores below 100% in window 5 include Diamond Bank, Fidelity Bank, FCMB, Skye Bank, Sterling Bank, Union Bank, Bank PHB, ETB, and Afribank. The performance of these DMBs reveals that the 2005 banking reforms

did not immediately translate to 100% efficiency scores as most of the DMBs had efficiency scores below 100%. However, even though most of the DMBs were not 100% efficient, there were improvements in their efficiency scores. More so, the several mergers and acquisitions that occurred in the Nigerian banking sector between 2005 and 2006 could be responsible for the inability of some DMBs to post 100% efficiency scores. As most DMBs were striving to come to terms with changes such as the integration of banking IT packages, banking cultures, and personnel. Thus, it is possible that these changes affected the ability of inputs to produce optimum output in the DMBs that either merged or were acquired.

Continuously, the performance of foreign DMBs in this window fell below the performance of Indigenous DMBs. Citibank, Standard Chartered, and Stanbic Bank are the only foreign DMBs on the efficiency frontier in window 5. The number of foreign DMBs in the Nigerian banking sector was reduced to four after the 2005 banking reforms. Hence, Ecobank is the only foreign DMB not to make it to the efficiency frontier within the window. Citibank is the most efficient of the foreign DMBs as it is efficient in 2 years (2005 and 2006) within the window. Citibank was not efficient in 2004 in the previous window, and this did not change in this window, however, the 100% perfect efficiency scores of the DMB in 2005 and 2006 lead to the conclusion that the increased regulatory capital impacted positively on the efficiency level of the DMB. In the same vein, Stanbic Bank and Standard Chartered Bank were not on the efficiency frontier in window 4 but both banks made entrances after the 2005 banking reforms in 2006. The perfect efficiency scores of these banks in 2006 is a further confirmation to the positive effect of the 2005 banking reforms on the performance of DMBs operating in Nigeria.

In conclusion, the efficiency levels of DMBs in this window attest to the notion that the 2005 banking reforms positively impacted on the performance of DMBs. Correspondingly, this window indicates that Indigenous DMBs performed better than their foreign counterparts within the Nigerian banking sector.

5.8   Window 6: BCC (2005, 2006, and 2007)

With the elimination of 2004 from the window and the introduction of the year 2007, the number of Nigerian DMBs further dropped to 29 in all the years x-rayed. 21 out of the 72

DMUs in this window were efficient, while 51 DMUs were inefficient. The percentage of efficient DMUs in window 6 tallied up to 29.17%, with the remaining 70.83% were inefficient. The average efficiency score improved by nearly 10% from 71.85% in window 5 to 81.83% in window 6. And just like in previous Windows, the aggregate efficiency of the Nigerian banking sector remains unsatisfactory. However, the improvement in the average efficiency score even though is still far from the efficiency level of 100% indicates that the 2005 banking reforms had a positive effect on the Nigerian banking sector.

Table 5.7 shows that there are more efficient DMUs in 2007, thus signifying improved efficiency in the Nigerian banking sector as the performance of DMBs in 2007 are better than the performance of DMBs in 2006, while the performance of DMBs in 2006 are also better than the performance of DMBs in 2005. In sum, this also leads to the notion that the 2005 banking reforms impacted positively on the performance of DMBs in the Nigerian banking sector.

About the performance of individual DMBs in window 6, IBTC was one of the two DMBs to be efficient in all three years in the previous window. The table of efficient DMUs (DMBs) in this window shows that IBTC Chartered Bank is the only DMB with 100% efficiency scores in all the three years in the window. Thus, the results make it the most efficient DMB in window 6. More so, IBTC Chartered was efficient as a purely indigenous Nigerian DMB before it merged with Stanbic bank in 2007 to become a foreign controlled DMB. Similarly, Stanbic bank was efficient in 2006 in both this window and window 5. Hence, the merger was of two efficient DMBs according to the obtained BCC efficiency scores. Also, the merger of two efficient DMBs, in this case, led to the birth of another efficient DMB in 2007 (Stanbic IBTC Bank).

Table 5.7: Window 6 List of Efficient DMUs (DMBs)

Efficient Banks	2005	2006	2007
Access Bank			✓
CitiBank Nigeria	✓	✓	
Ecobank Nigeria			✓
First Bank	✓	✓	
IBTC Chartered Bank	✓	✓	✓
Standard Chartered		✓	
Stanbic Bank		✓	
UBA	✓		✓
Unity Bank			✓
Wema Bank	✓	✓	
Oceanic Bank			✓
Intercontinental Bank		✓	✓
Bank PHB			✓
Afribank			✓

In like manner, Citibank another foreign DMB is efficient in two years (2005 and 2006) within this window. The performance of the DMB in this window mirrors the performance of the bank in window 5. Citibank was not involved in any merger or acquisition during the consolidation exercise of the 2005 banking reforms, as such the DMB only increased its regulatory capital to N25 billion. Hence the branch network of the DMB remained the same, but the DMB was able to at least stay efficient in years within the window, even though much larger DMBs were not able to produce 100% efficiency scores in any single year immediately after the 2005 banking reforms. Therefore, an extensive branch network does not guarantee the efficiency.

Furthermore, Standard Chartered Bank and Ecobank are the other foreign DMBs on the efficiency frontier of window 6. Standard Chartered bank was efficient in 2006, while Ecobank was efficient in 2007. Standard Chartered was efficient in 2006 in window 5,

whereas Ecobank a Pan-African foreign bank made it to the table of efficient DMUs (DMBs) for the first time as it was efficient in 2007. Taking into consideration the merger between IBTC Bank and Stanbic Bank, 6 of the efficient 21 DMUs in this window are mostly foreign owned. However, the limited number of foreign DMBs in the Nigerian banking sector indicates that Indigenous DMBs dominate the banking sector. Hence, it is rational for the indigenous DMBs to have more of the efficient DMUs although the possibility exists based on the efficiency scores in this window that foreign banks would have performed better than the Indigenous DMBs if they were of the same number.

Additionally, First Bank lost its position as the most efficient DMB after its spell as the most efficient DMB in window 4 and window 5. First Bank had 100% efficiency scores in 2005 and 2006 within this window, while its 2007 efficiency score plummeted to 73.91%. The efficiency scores on its own cannot provide justifications for the sudden fall, although the plunge can be attributed to the episode of the 2007 banking reforms which started in the second half of 2007. More so, it is likely that the euphoria of the 2005 banking reforms began to wane off and the performance of banking institutions going forward depended on the effective utilisation of inputs.

In furtherance of the performance of DMBs in this window, Access Bank was efficient in 2006 in window 5 but is not efficient in the same year within this window. However, it was efficient in 2007. In like Manner, UBA is efficient in 2005 and 2007 in this window, but it also had an efficiency score of 100% in 2006 in window 5. The same can be said of Oceanic Bank which was also efficient in 2006 in window 5 but is only efficient in 2007 in window 6. The efficiency scores of these banks suggest that their performance in 2007 was superior to their 2006 performance, which led to their inability to be on the efficiency frontier. More so, the failure of some DMBs to replicate their 2005 performance in 2006 submits that efficiency levels surged in reaction to increased regulatory capital before slightly falling in 2006.

Conversely, DMBs like Wema Bank and Intercontinental Bank maintained their 2006 position on the efficiency frontier in this window. However, Intercontinental Bank lost its 2005 position on the efficiency frontier. Therefore, the results of this window indicate that the improvement in the performance of the DMB was progressive, as the 2006 and 2007 performance of the DMB was better than its performance in 2005. On the other hand, the 2005 and 2006 efficiency scores of Wema Bank were better than its 2007 efficiency score as efficiency dropped to 97.59%. Just like the performance of First Bank in this window, it is

more likely that the 2005 and 2006 perfect efficiency scores of Wema Bank was hinged on the 2005 increase in regulatory capital and the merger of the DMB with National Bank. In the same vein, it can also be claimed that the decline in the performance of the DMB in 2007 is related to the event of the global financial crisis which started in the second half of 2007.

Correspondingly, in addition to Ecobank mentioned in the review of the performance of foreign DMBs in this window, Unity Bank, Bank PHB, and Afribank appeared on the efficiency frontier for the first time with 100% efficiency scores in 2007. Apart from Ecobank which is a foreign DMB, Unity Bank, Bank PHB and Afribank were all involved in mergers and acquisitions. The fact that all three DMBs were not efficient in 2005 and 2006 could be down to the cumbersome nature of merger and acquisition strategies. Hence the inability of the DMBs to muster 100% efficiency scores in 2005 and 2006. Nonetheless, the merger and acquisition process the DMBs went through accorded them larger branch networks and larger customer bases which should rationally translate to more deposits and business opportunities (further inputs and outputs). Therefore, it is likely these benefits account for the 100% efficiency score of the DMBs in 2007.

In conclusion, all the DMBs that survived the consolidation exercise of the 2005 banking reforms had regulatory capital of N25 billion and above. Hence, all the DMBs in the banking sector had the capacity of competing on the same level based on the general push in inputs. However, based on the efficiency scores, not all the DMBs were able to attain efficiency levels of 100% after the 2005 reforms. Nevertheless, even though not all the DMBs on the table are efficient in all the years and not all the DMBs that survived the consolidation exercise are efficient for at least one year within the window. The results indicate an improvement in the performance of DMBs because of the 2005 banking reforms and the various mergers and acquisitions that the reforms facilitated.

5.9   Window 7: BCC (2006, 2007, and 2008)

With the conclusion of the 2005 Nigerian banking reforms, DMBs in the first year of this window were saddled with the task of integrating people, processes, systems and culture. Unfortunately, as the money deposit banks were still trying to settle down, the global financial crisis started in the second half of 2007 and continued all through 2008.

Due to the 2005 banking reforms, a total of 24 DMBs which translated to 65 DMUs (observations) is examined in this window. There are 21 efficient DMUs and 44 inefficient DMUs in this window. Put differently, 32.31% of the DMUs are efficient, while the remaining 67.69% are inefficient. The percentage of efficient DMUs is an improvement on the 29.17% of window 6, even as the financial crisis started and took root within this window. Similarly, the average efficiency score of this window is also greater than that of window 6, as the efficiency scores of DMUs in the years 2006, 2007 and 2008 tallied up to 85.1%.

In the whole and based on the principles of DEA, the average efficiency score, just like in all the windows examined thus far falls below the efficiency level of 100%. However, the raising average efficiency score even in difficult periods like the global financial crisis indicates that the 2005 banking reforms made DMBs more formidable.

Table 5.8: Window 7 List of Efficient DMUs (DMBs)

Efficient Banks	2006	2007	2008
CitiBank Nigeria	✓		
Fidelity Bank			✓
First Bank	✓		✓
First City Monument			✓
Guaranty Trust Bank			✓
IBTC/Stanbic IBTC	✓	✓	✓
Standard Chartered	✓	✓	
Stanbic Bank	✓		
Unity Bank		✓	
Wema Bank	✓		
Zenith Bank			✓
Oceanic Bank			✓
Intercontinental Bank		✓	✓
Bank PHB		✓	✓
Afribank		✓	

Given the performance of individual banks within window 7, the table of efficient DMBs shows that IBTC Bank, which became Stanbic IBTC Bank in 2007 is the most efficient bank with efficiency scores of 100% in all the three years. Stanbic IBTC Bank as it is presently called retains its position as the most efficient DMB in this window based on the BCC efficiency scores obtained. And just like the window 6, the most efficient DMB in the banking sector is a foreign DMB. Also, Stanbic Bank also maintains it's 2006 100% efficiency score in this window before its merger with IBTC Bank in 2007.

In like manner, Citibank another foreign DMB is only efficient in 2006, whereas Standard Chartered Bank has 100% efficiency scores in 2006 and 2007. Thus, suggesting a decline in the performance of foreign DMBs especially in 2008 which could most likely be due to the episode of the global financial crisis. Conversely, Ecobank dropped out of the efficiency

frontier in this window as it was efficient in 2007 in window 6. Consequently, the absence of Ecobank on the efficiency frontier in this window is an indication that the efficiency frontier of this window is superior to the efficiency frontier of window 6. More so, the table of efficient DMUs (DMBs) indicates that there were more efficient foreign DMBs when compared against the efficiency level of Indigenous DMBs in the Nigerian banking sector in 2006.

Moreover, in addition to the four foreign DMBs with 100%, efficiency scores in 2006 within this window, First Bank, and Wema Bank are the only other banks with 100% efficiency scores. Therefore, confirming the superior efficiency frontier of this window over that of window 6. In conjunction with the above notion, the inability of Intercontinental Bank to post a 100% efficiency score in 2006 in this window confirms the superiority of the efficiency frontier of this window. Also, an upgrade of the efficiency frontier is an indication of an improvement in the measure of comparison within the window and the Nigerian banking sector.

Furthermore, an examination of the table above reveals that Unity Bank, Intercontinental Bank, Bank PHB and Afribank maintained their 100% efficiency scores of 2007 in this window. However, only Intercontinental Bank and Bank PHB are efficient in 2008 as Unity Bank posted efficiency score of 87.25%, while there was an absence of 2008 data to examine the performance of Afribank.

Simultaneously, apart from Stanbic IBTC Bank which became a foreign controlled DMB in 2007, all the other efficient DMBs in 2008 within this window are Indigenous DMBs. Hence, suggesting that Indigenous DMBs performed better than foreign DMBs in the Nigerian banking sector during the global financial crisis. At the same time, the 2008 efficiency scores of this window also reveal an improvement in the performance of large DMBs.

Finally, the results of this window further indicate that the performance of Nigerian DMBs improved in the post-2005 banking reforms era. However, the performances of foreign DMBs were superior to the performance of Indigenous DMBs in 2006. Also, the efficiency scores of 2007 and 2008 indicate that the episode of the global financial crisis negatively affected the performance of the foreign DMBs more than it affected the performance of Indigenous DMBs.

5.10 Window 8: BCC (2007, 2008, and 2009)

The years x-rayed in this window predominately covers the entire period of the global financial crisis. 23 DMBs that translate to 64 DMUs (observations) are examined in this window. According to the results obtained, there are 26 efficient DMUs in this window, while 38 DMUs are inefficient. As such, 40.63% of the DMUs are efficient while 59.38% of the total numbers of DMUs are inefficient. The increase in the percentage of efficient DMUs from 32.31% (window 7) to 40.63% (window 8) is a substantial leap. In the same vein, the average efficiency score increased to 89.83%. Even though the average efficiency score falls short of the efficiency level of 100% by 10.17%, this result is impressive given that the three years examined in this window are the years in which the global financial crisis took root and ran its course. However, is should be noted that the efficiency scores of organisations are dependent on the most efficient frontier, and that is the reason why some DMUs (DMBs) are efficient in a particular year in one window and are not efficient in that same year in another window. In summary, the efficiency of a DMU in a particular window is hinged on the efficiency of the best performing DMU and the best performing DMU is determined by the optimal utilisation of inputs to generate maximum outputs.

Table 5.9: Window 8 List of Efficient DMUs (DMBs)

Efficient Banks	2007	2008	2009
Access Bank		✓	✓
CitiBank Nigeria	✓	✓	✓
Fidelity Bank		✓	
First Bank		✓	✓
First City Monument		✓	
Guaranty Trust Bank		✓	✓
Stanbic IBTC	✓	✓	
Standard Chartered	✓		✓
Union Bank	✓	✓	
UBA			✓
Zenith Bank		✓	✓
Oceanic Bank			✓
Intercontinental Bank	✓	✓	
Bank PHB		✓	✓
Afribank			✓

Regarding the optimum utilisation of inputs by individual DMBs, the number of DMBs with efficiency scores of 100% in at least one year within this window is the largest of all the windows. 15 DMBs with 26 DMUs or observations are on the efficiency frontier.

Citibank is the only DMB with efficiency scores of 100% in all the years. Citibank was not efficient in 2007 in the previous window but is efficient in this window. There are instances that the efficiency frontier of a particular window is lower than that of a previous window. In such an instance, a DMU that was not efficient in a previous window might become efficient in another. Therefore, it is possible that the efficiency of Citibank in 2007 within this window is an indication that the efficiency frontier of this window is below the efficiency of the

previous window. Just like in the last window, the most efficient DMB in the Nigerian banking sector is a foreign institution.

Similarly, Stanbic IBTC Bank and Standard Chartered Bank are the other foreign DMBs on the efficiency frontier within the window. Stanbic IBTC Bank is efficient in 2007 and 2008, whereas Standard Chartered Bank is efficient in 2007and 2009. The results of this window suggest that the inability of Standard Chartered Bank to post a 100% efficiency score in 2008 and failure of Stanbic IBTC Bank to muster a 100% efficiency score in 2009 was likely due to the adverse effect of the global financial crisis. The results of this window, in general, show that foreign DMBs in Nigeria (apart from Ecobank) were efficient in at least two years. Hence they fared well during the global financial crisis. Nonetheless, the possibility exists that the efficiency frontier of this window is less superior to the efficiency frontier of the last window that is why some DMUs were not efficient in window 7 but are efficient in window 8. However, the next window will most likely confirm the extent to which foreign DMBs operating in the Nigerian banking sector were affected by the episode of the global financial crisis.

Moreover, Intercontinental Bank and Union Bank are the only Indigenous DMBs with 100% efficiency scores in 2007 in this window. The unsatisfactory performance of Indigenous banks in 2007 within this window highlights the inability of DMBs in Nigeria to sustain the benefits of the 2005 banking reforms. Consequently, the results of this window posit that increased regulatory capital does not guarantee high-efficiency levels, as efficiency improves immediately after capital injections but plummets after just a year or two. Consequently, the inability of some DMBs to remain efficient and build on the N25 billion capital base led to the bailout of eight DMBs. Likewise, after appearing to be efficient in 2007 and 2008 within the window, both Intercontinental Bank and Union Bank were bailed out in 2009 due to high levels of non-performing loans. The 2008 performance of both DMBs did not show the banks were in grave danger. Even though Intercontinental Bank and Union Bank received capital injections in 2009 as a result of the bailout from Nigerian regulators, they were unable to muster efficiency scores of 100% in 2009. Intercontinental Bank had a score of 74.34, while Union Bank had a score of 69.23. The efficiency scores of these DMBs in 2009 show that the performance of DMBs can depreciate severely within one year. Therefore, the bailout strategy was unable to reserve negative trends in the utilisation of inputs.

In like manner, Afribank, Bank PHB and Unity Bank were efficient in 2007 in window 7 but are not efficient for the same period in window 8. The 2007 efficiency scores of this window cast doubt on the notion that the efficiency frontier of this window is less superior to that of window 7. However, it is pertinent to state that the DEA window technique calculates efficiency scores of each window without considering the efficiency scores of other windows. Therefore, the make-up of the inputs and outputs of the efficiency frontier could alter the composition of the DMUs on the efficiency frontier. Afribank, Bank PHB and Unity Bank were also bailed out in 2009. Unity Bank was not on the efficiency frontier in the entire window, thus confirming the opinion above that the bailout out strategy did not immediately change the fortunes of distressed banks. On the other hand, the bailout positively impacted on the performance of Afribank and Bank PHB as both DMBs posted 100% efficiency scores in 2009, although Bank PHB had a 100% efficiency score in 2008. In sum, the efficiency scores of this window show that the bailout strategy of Nigerian regulators affected DMBs in different ways. Most of the bailed out DMBs did not become efficient immediately after the capital injection, while some instantly stretched their efficiency levels to 100%. For instance, Oceanic Bank was only efficient in this window in 2009 after it received the bailout funds.

In continuation, Fidelity Bank and FCMB are only efficient in 2008 within this window. Both DMBs did not carry on their 2008 efficiency levels into 2009 which could be as a result of the effect of the global financial crisis. Access Bank, First Bank, GTB, and Zenith Bank are efficient in 2008 and 2009 within this window. All four DMBs are classified as large Nigerian DMBs with international operations, and in line with the requirements of the 2009 banking reforms, they all increased their regulatory capital to N100 billion. On that account, the perfect efficiency scores of these four DMBs could be anchored on the capital base of the DMBs, the large size of the DMBs, the 2009 banking reforms in general, or the ability of the banks to actually manage inputs that generate maximum outputs. Furthermore, UBA another large DMB is only efficient in 2009 in this window. And the reason for the efficiency of the DMB in 2009 could likely be due to the same reasons the four large DMBs above are efficient in 2009.

In conclusion, the results of this window draw down on several issues. First, the foreign DMBs in the Nigerian banking sector posted impressive results that suggest they were not severely plagued by the episode of the global financial crisis in the initial stages of the crisis. In relation to the global financial crisis, Nigerian regulators due to high non-performing loans and the adverse effects of the global financial crisis bailed out eight Nigerian DMBs. The

efficiency scores of this window indicate that the bailout strategy was not able to return most of the banks to efficiency. Finally, the efficiency scores of the large DMBs suggest that the 2009 banking reforms shielded the DMBs from the adverse effects of the global financial crisis as efficiency levels peaked during the global financial crisis. However, some of the efficiency scores in the window somewhat propose that the efficiency frontier in this window is less superior to the efficiency frontier of window 7 as DMUs that were not efficient in window 7 are efficient in window 8.

5.11   Window 9: BCC (2008, 2009, and 2010)

This window is significant to achieving the aims and objectives of this study because of the array of events that occurred in the three years examined. The global financial crisis became full-blown in 2008, eight DMBs were bailed out in 2009, and the dateline to increase capital requirements in line with the four-tier banking model, in addition to the review of corporate governance principles all ensued within this window.

Just as in the previous window, there are 23 banks in this window. The banks with data translated to 63 DMUs, of which there are 18 efficient DMUs and 45 inefficient DMUs. As a result, 28.57% of the DMUs were efficient, while the remaining 71.43% were inefficient. In the same vein, the average efficiency score of this window also plunged to 82.92% after attaining the average efficiency score of 89.83% in window 8. The plummeting average efficiency score could be due to the adverse effect of the global financial crisis and in general the changing economic landscape of the Nigerian banking sector. In conclusion, just like all the windows reviewed thus far, the average efficiency score falls short of the 100% efficiency mark of the DEA technique.

Table 5.10: Window 9 List of Efficient DMUs (DMBs)

Efficient Banks	2008	2009	2010
Access Bank		✓	
Fidelity Bank	✓		
First Bank	✓	✓	✓
First City Monument	✓		
Guaranty Trust Bank	✓	✓	
Stanbic IBTC			✓
Standard Chartered			✓
Unity Bank			✓
Zenith Bank	✓	✓	✓
Oceanic Bank		✓	
Intercontinental Bank	✓		
Bank PHB	✓		
Afribank		✓	

As regards the performance of individual DMBs within this window, there are less foreign DMBs on the table. Stanbic IBTC and Standard Chartered Bank are only efficient in 2010.Consequently, of the 18 efficient DMUs within the window; a solitary 2 are foreign. On this account, this indicates that foreign DMBs were severely affected by the global financial crisis than the previous window let on. For instance, Citibank has been a consistent feature on the table of efficient DMUs and was the most efficient DMB in the last window. Therefore, Citibank was efficient in 2008 and 2009 in window 8 but are not efficient in any of the years in this window. The performance of Citibank in this window suggests that the efficiency frontier in this window is superior to the efficiency frontier of window 8.

More so, the results of this window show that First Bank and Zenith Bank with perfect efficiency scores of 100% in all three years are the most efficient DMBs in the window. Both DMBs in line with the four-tier banking model of the 2009 banking reforms increased their regulatory capital to N100 billion. The 100% efficiency scores of the DMBs in 2008 allege

that the global financial crisis did not negatively impact on the performance of the DMBs. In the same vein, it is also possible that the increased regulatory capital of the large DMBs ensured the continuous efficiency of the DMBs within the window.

In like manner, Guaranty Trust Bank (GTB) is efficient in two years (2008 and 2009) within this window. The 100% efficiency scores of the DMB further confirm the limited effect of the global financial crisis on the performance of large DMBs. As one of the large DMBs in the Nigerian banking sector, GTB increased its regulatory capital to N100 billion in line with the tenets of the 2009 banking reforms. However, even though it was efficient in 2009, the N100 billion capital base was not enough to guarantee its continuous presence on the efficiency frontier as its efficiency score in 2010 within this window slightly dipped to 99.74%. In essence, not all DMBs that increase regulatory capital utilise their inputs in excellent ways that produce high-efficiency levels due to diverse business models, management styles, risk management techniques, market coverage and customer types.

Except for First Bank, Zenith Bank and Guaranty Trust Bank, all the other DMBs on the table are only efficient in one year each within window 9. Access Bank another large DMB had an efficiency score of 99.61 in 2008, which was not far from 100 but not considered to be efficient. However, the DMB mustered an efficiency score of 100% in 2009, which could be down to the 2009 banking reforms and increased regulatory capital. Progressively, although the 2010 efficiency score of Access Bank was 93.55, it was not far from 100. Nonetheless, it revealed that increase in regulatory capital was not an assurance for improved efficiency levels. It also showed that the efficiency level of DMBs improves right after capital is injected or increased but drops in the second year of the capital increase.

Moreover, Fidelity Bank was efficient in 2008 but saw its efficiency scores plummeted to 67.13 in 2009 and 73.37 in 2010. The rate of descending shows how fast a DMB can go from being efficient to being inefficient. But to be particular in this window, the plunge in the efficiency level of Fidelity Bank was most likely due to the event of the global financial crisis.

Concerning the bailout of eight distressed DMBs in 2009, the performances of the bailed-out DMBs offer an interesting dilemma. Five (5) out of the eight (8) bailed-out DMBs are on the table of the efficient DMUs in this window. Intercontinental Bank and Bank PHB are efficient in 2008 on the table, while Oceanic Bank and Afribank were efficient in 2009. Equally, Unity Bank is the only bailed-out DMB to be efficient in 2009 within window 9.

Firstly, the performance of Intercontinental Bank and Bank PHB after 2008 shows that the efficiency level of DMBs can depreciate within one year and capital injections is not always capable of transforming the fortunes of a failing bank. Secondly, bailouts can temporarily boost the efficiency level of DMBs as it is in the case of Oceanic Bank and Afribank. However, this temporary increase was not sustained in subsequent years. Finally, the bailout of Unity Bank was not immediately visible as the bank was only efficient in 2010 within the table. Therefore, capital injections in the form of bailout packages affect banking institutions in several ways, and they do not necessarily translate to efficiency.

To conclude the review of DMBs in this window, the large DMBs performed better than other DMBs and showed they were not adversely affected by the global financial crisis. And given the 2009 banking reforms which mandated DMBs with business operations outside the shores of Nigeria to increase their regulatory capital to N100bn, the large DMBs were able to maintain high-efficiency levels. More so, foreign DMBs performed poorly in this window and in essence suggested that they were severely affected by the episode of the global financial crisis. Additionally, eight DMBs were bailed-out, but only five of them made it to the efficiency frontier in this window. Hence, bailout strategies in most instances do not change the input usage of DMBs. This notion is further confirmed by the efficiency scores of the other three bailed out DMBs that were not able to post 100% efficiency scores in any of the years x-rayed in this window.

5.12   Window 10: BCC (2009, 2010, and 2011)

This window consists of the 2009 reforms and the latter days of the global financial crisis. A total of 25 DMBs with data translate to 63 DMUs are examined in this window. There are 16 efficient DMUs this window, while the inefficient DMUs (observations) are 47. Regarding the proportion of efficiency within the window, the percentage of efficient DMUs was 25.4%, while 74.6% was inefficient. The average efficiency score further dropped to 77.91% from 82.92% (window 9). The decline in the average efficiency score in two consecutive windows could be a confirmation that the performances of DMBs have been less than satisfactory or the efficiency frontier has improved vis-a-vis the performance of other DMBs. More so, the decreasing average efficiency score could be because of the adverse effect of the global

financial crisis. Nevertheless, in line with the principles of DEA, the average efficiency score of 77.91% indicates that the Nigerian banking sector is inefficient.

Table 5.11: Window 10 List of Efficient DMUs (DMBs)

Efficient Banks	2009	2010	2011
Access Bank	✓		
First Bank	✓	✓	✓
First City Monument		✓	
Guaranty Trust Bank	✓		✓
Stanbic IBTC		✓	✓
Standard Chartered		✓	✓
Unity Bank		✓	
Zenith Bank	✓		✓
Oceanic Bank	✓		
Afribank	✓		

Data from the table above indicates that only First Bank has perfect efficiency scores in all the three years within the window. As intimated in the review of the previous window of which First Bank was one of the two most efficient DMBs, the increase in regulatory capital for DMBs with international operations was integral to the efficiency of the major Nigerian DMBs during the period the global financial crisis persisted. However, the efficiency of Tier I DMBs in this window confirms the assertion that efficiency levels improve in the year capital requirements is increased but declined in the second year. The only exception to this view in this window is First Bank. Zenith Bank was efficient in all three years in the last window and but is not 100% (i.e. 95.72) efficient in 2010 in this window. It is 100% efficient in 2009 and 2011. In like manner, GTB is efficient in 2009 and 2011 but not in 2010. The slight decline in the efficiency scores of both DMBs in 2010 could be down to restructuring that occurred in the Nigerian banking sector due to the 2009 banking reforms.

The performance of Access Bank was not as impressive as those of First Bank, Zenith Bank, and GTB. Access Bank was only able to churn out a 100% efficiency score in 2009 within the window. Nonetheless, the DMB was deemed to be in good shape by regulators as they approved the DMB's acquisition of Intercontinental Bank. Intercontinental Bank was bailed out in 2009 but was unable to improve on its dwindling risk positions, hence the take-over by Access Bank. Nonetheless, the acquisition of Intercontinental Bank led to a dip in the efficiency score of the Bank. The efficiency score of the bank dropped from 94.03 in 2010 to 74.7. In essence, the efficiency score of Access Banks suggests that the acquisition of a distressed bank could negatively impact on the efficiency of a well-functioning banking institution.

In the same vein, FCMB was not efficient in 2009 within this window but had an efficiency score of 100 in 2010. And in similar fashion with Access Bank, FCMB acquired Finbank in 2011, and its efficiency score dropped to 84.46 in 2011. Therefore, in conjunction with the submission made above, the acquisition of a less efficient DMB could impact negatively on the performance of the acquiring DMB.

In furtherance of the review of the performance of the DMBs in this window, the table of efficient DMUs (DMBs), shows that three out of the eight bailed out DMBs are efficient in one year each within the window. The performances of Oceanic Bank, Afribank, and Unity Bank in this window mirror their performance in window 9. Oceanic Bank and Afribank were efficient in 2009, while Unity Bank was efficient in 2010. The 100% efficiency scores of the Oceanic Bank and Afribank in 2009 could be down to the bailout capital injection. However, the performances of these DMBs did not improve as at 2010, and Oceanic Bank was acquired by Ecobank, while the banking license of Afribank was revoked and nationalised into a bridge bank (Mainstreet Bank) in 2011. The performance of these DMBs and the performance of the other bailed out DMBs that were not able to make any appearance on the efficiency frontier within the window posit that the bailout strategy does not always lead to improvements in the utilisation of inputs. Therefore, the bailout strategy was unsuccessful in transforming the input and output production level of some DMBs.

Conversely, not all the bailed out DMBs were acquired or nationalised into bridge banks. As shown in the table above, Unity Bank being one of the bailed out DMBs was efficient in 2010 and unlike other bailed-out DMBs that were acquired or nationalised into Bridge banks, Unity Bank maintained its status as a National banking institution. Similarly, Union Bank

which was bailed out in 2009 also maintained its status as a National banking institution. Although Union Bank was not efficient in any of the post-bailout years, it was not acquired or nationalised into a bridge bank as it was able to manage its inputs more favourably. As a result, the bailout strategy was not entirely unsuccessful.

Moreover, only two foreign DMBs (Stanbic IBTC and Standard Chartered) were efficient in this window. Both DMBs had 100% efficiency scores in 2010 and 2011. The efficiency scores of Stanbic IBTC and Standard Chartered Bank indicates they are recovering from the adverse effect of the global financial crisis, as the results of previous windows revealed a decline in the efficiency of foreign DMBs during the global financial crisis. On the contrary, the efficiency scores of the other foreign DMBs (Citibank and Ecobank) in the Nigerian banking sector range from 60 to 90. Therefore, not all the foreign DMBs immediately recovered from the event of the global financial crisis, even though the acquisition of Oceanic Bank by Ecobank could be responsible for its inefficient BCC scores.

In summary, the limited number of DMBs on the efficiency frontier in this window hypothesise that the episode of the global financial crisis negatively impacted on the aggregate performance of Nigerian DMB. Specifically, the results obtained in this window point out that the global financial crisis affected foreign DMBs more than it affected Indigenous Nigerian DMBs. Finally, the efficiency scores in this window suggest that performance of the large DMBs were faintly affected by the global financial crisis and the 2009 banking reforms had a positive effect impact on the performance of Nigerian DMBs.

5.13   Window 11: BCC (2010, 2011, and 2012)

This window consists of the post-global financial crisis and post-2009 Nigerian banking reforms and comprises of the years 2010, 2011 and 2012. 24 DMBs that translate to 61 DMUs or observations are examined in this window. There are 18 efficient DMUs within this window, while the remaining 43 DMUs are inefficient. As such, the percentage of the efficient DMUs stood at 29.51%, whereas the remaining 70.49% are inefficient. Just as in Window 10, the average efficiency score of this window dropped from 77.91% to 77.23%. Moreover, the performance of the bailed-out DMBs and those of the bridge banks in 2011 account largely for the decline in the average efficiency score. Therefore in line with the

principles of the DEA technique, the aggregate performance of Nigerian DMBs (77.23%) suggests that the banking sector was inefficient in window 11.

Table 5.12: Window 11 List of Efficient DMUs (DMBs)

Efficient Banks	2010	2011	2012
Access Bank	✓		
First Bank	✓	✓	✓
First City Monument	✓		
Guaranty Trust Bank	✓	✓	
Skye Bank		✓	✓
Stanbic IBTC	✓	✓	
Standard Chartered	✓	✓	
UBA			✓
Unity Bank	✓		
Zenith Bank	✓	✓	✓

The table above indicates that half of the DMBs in the Nigerian banking sector are not efficient in any of the years covered in this window. The DMBs not on the efficiency frontier already suggest they are inefficient. Given the performance of individual DMBs as depicted in the table above, there are 10 DMBs on the efficiency frontier, and they are relied upon to provide a picture of the general performance of the banking sector.

First Bank and Zenith Bank are the most efficient banks within the window with perfect efficiency scores of 100% in all three years. First Bank was also efficient in all three years in the last window. Zenith Bank, on the other hand, was not efficient in 2010 in the last window but is efficient in all the years in this window. The change in the efficiency frontier due to the inclusion of 2012 most likely led to the efficiency of Zenith Bank, GTB and Access Bank in 2010, and Skye Bank in 2011. Also, UBA is efficient 2012. UBA, however, has not been a feature on the table of efficient DMUs even though it is one of the largest DMBs in the

Nigerian banking sector. The increased presence of big banks could be attributed to the increase in capital requirement to N100 billion for DMBs with branches outside Nigeria.

More so, as intimated in the last window, the inability of Access Bank to post 100% efficient scores in 2011 and 2012 in this window was most likely due to its acquisition of Intercontinental Bank in 2011. In similar fashion, FCMB is efficient in 2010 within this window, and it began the process of acquiring Finbank in 2011. The efficiency scores of FCMB dwindled from 100 in 2010 to 89.88 in 2011, and to 76.13. Therefore, with regards to the performance of the 24 DMBs in this window, the efficiency scores of FCMB in 2011 and 2012 indicate that the acquisition of Finbank impacted negatively on the efficiency level of the DMB.

Unity Bank is the only bailed out institution in this window, as it maintained its 2010 100% efficiency score. The presence of Unity Bank (i.e. out of the 8 bailed out DMBs) further confirms the inability of the bailout strategy in transforming the fortunes of troubled Nigerian DMBs.

Stanbic IBTC and Standard Chartered Bank (foreign DMBs) mirror their performance in window 10. The efficiency scores do not suggest an improvement in the performance of foreign DMBs in this window. Citibank was one of the most efficient banks in the Nigerian banking sector before the global financial crisis. However, the efficiency scores of the DMB after the global financial crisis informs this study that it was affected more than other DMBs by the event of the global financial crisis. Ecobank as well is not on the efficiency frontier in the entire window. It acquired Oceanic Bank in 2011, and although its efficiency score surged from 87.95 in 2010 to 88.09 in 2011, it fell to 70.14 which could be as a result of the acquisition of a troubled institution.

In summary, the performance of large DMBs suggests that the Nigerian banking sector has recovered from the adverse effect of the global financial crisis. Conversely, the performance of the DMBs that did not make it to the efficiency frontier suggests otherwise. The results indicate that the 2009 banking reforms improved in large part only the performance of large DMBs that increased their regulatory capital to N100bn and above. More so, the limited presence of foreign DMBs on the efficiency frontier in this window posits that the performance of indigenous DMBs outweighs the performance of the foreign banks operating in Nigeria. Finally, the results of the window further revealed that the bailout strategy was not as effective as imagined.

5.14   Window 12: BCC (2011, 2012, and 2013)

This window consists of the post-global financial crisis and the post-2009 banking reforms era. In essence, this window seeks to provide answers to the extent of which Nigerian banking sector has recovered from the global financial crisis and whether the 2009 banking reforms has a positive effect on the performance of Nigerian DMBs.

The number of DMBs in this window dropped to 20 because of the acquisition of Oceanic Bank by Ecobank, the acquisition of Intercontinental Bank by Access Bank, the acquisition of Finbank by FCMB, and the acquisition of Equitorial Trust Bank by Sterling Bank. Resultantly, 60 DMUs are examined in this window.

Given the efficiency of the Nigerian banking sector in window 12, the result shows 23 efficient DMUs and 37 inefficient DMUs. Put differently, 38.33% of the DMUs in this window are efficient, whereas the remaining 61.67% of the DMUs are inefficient. The percentage of efficient DMUs in this window witnessed an increase of 29.51% from that of window 11. Still, on the positive premise, the average efficiency score surged to 85.26% after steadily plummeting from 89.83% in window 8 to 77.23% in window 11. The surge in the average efficiency score could be an indication that the Nigerian banking sector has started to recover from the adverse effect of the global financial crisis that saw a drop in the efficiency level of some banks. Additionally, it could also be an indication that the initiative to reform the Nigerian banking sector by regulators was a step in the right direction. Nonetheless, the inability of the banking sector to attain a 100% efficiency score suggests in line with the principles of DEA that the Nigerian banking sector was inefficient in window 12.

Table 5.13: Window 12 List of Efficient DMUs (DMBs)

Efficient Banks	2011	2012	2013
CitiBank Nigeria	✓	✓	✓
Diamond Bank	✓		
Enterprise Bank		✓	
Fidelity Bank		✓	
First Bank	✓	✓	✓
First City Monument	✓		
Guaranty Trust Bank	✓	✓	✓
Mainstreet Bank		✓	✓
Skye Bank	✓	✓	
Stanbic IBTC	✓		
Standard Chartered	✓		
UBA			✓
Zenith Bank	✓	✓	✓

Apart from Citibank and GTB, all the DMBs in the Nigerian banking sector and this window are products of mergers and acquisitions, bridge banking, or purchase and assumption agreements. More so, being that the performance of the above DMBs is studied in the post global financial crisis and post 2009 banking reforms era, the conclusions inferred are significant to achieving the aims and objectives of this research.

For the first time in this study, there are four DMBs with perfect efficiency scores in all three years (Citibank, First Bank, Guaranty Trust Bank and Zenith Bank). Citibank is a foreign DMB, whereas First Bank, GTB and Zenith Bank are Indigenous Nigerian DMBs with international banking operations with regulatory capital of N100bn and above. The increase in the number of DMBs with perfect efficiency scores in all the three years in a particular window indicates optimum input utilisation. Hence, even though the increase in the efficiency scores of DMBs in this window is an indication of improved performance, the possibility exist that the efficiency frontier of this window is less superior to that of window

11 because some DMUs that were not efficient in window 11 are efficient in this window. More so, UBA another large DMB on the table above is efficient in 2013, thus reinforcing the notion that the 2009 banking reforms had a positive effect on the performance of DMBs.

In addition, Skye Bank is the only DMB in this window to be efficient in two years (2011 & 2012). Skye Bank is a Tier 2 Nigerian DMB according to the 2009 banking reforms classification and its efficiency scores in this window indicate that it is amongst the most efficient DMBs in the banking sector. More so, the other Tier 2 DMBs found to be efficient in one year each within the window includes Diamond Bank (2011), FCMB (2011) and Fidelity Bank (2012). None of these DMBs were bailed-out in 2009, indicating that they satisfactorily navigated the global financial crisis. The performance of these DMBs also suggests that the 2009 banking reforms were to some extent successful in shielding Nigerian DMBs from the adverse effect of the global financial crisis.

On account of the above, two bridge banks out of the three nationalised bridge banks are efficient in at least one year within this window. Enterprise Bank is efficient in 2012, whereas Mainstreet Bank is efficient in 2012 and 2013 within this window. The three bridge banks in the Nigerian banking sector came into existence in 2011. The fact that two make it to the table of efficient DMUs (DMBs) is impressive. It is, therefore, an indication that the initiative to adopt the bridge banking initiative was a step in the right direction. Conversely, the success of the bridge banking mechanism highlights the failure of the bailout financial safety nets strategy. By the fact that the bridge banking mechanism would not have been adopted if the financial safety net bailout strategy was a success.

In view of the performance of foreign DMBs in the Nigerian banking sector, Citibank showed 100% efficiency scores in all the three years of this window. Citibank was last efficient in window 8, and by being a foreign DMB, it was adversely affected by the global financial crisis. Citibank was not efficient in 2011 and 2012 in the last window which indicates a change in the measure of assessment of efficiency due to the 2013 inclusion of the inputs and outputs financial figures. Equally, Stanbic IBTC and Standard Chartered Bank who had better efficiency scores to Citibank in Windows 9, 10 and 11 were only efficient in 2011 within this window. The plunge in the efficiency score of Citibank in Windows 9, 10 and 11could be because it is a member of the financial services multinational Citigroup of America, whereas the other foreign banks on the table are members of South African banking groups. Moreover, because the global financial crisis originated in U.S.A, banking

institutions owned by American owners probably suffered more from the adverse effect of the global financial crisis. On the contrary, Ecobank is the only foreign bank with no efficient DMU in this window. Ecobank acquired Oceanic bank in 2011, and the efficiency scores of the bank in this window and the previous window opine that the acquisition of a troubled bank impacts negatively on efficiency scores. Nonetheless, the efficiency scores of the foreign DMBs in this window lead to the assumption that the foreign DMBs have recovered from the episode of the global financial crisis.

In summary, the aggregate efficiency scores of DMBs in this window opine that the 2009 banking reforms were successful in repositioning most of the DMBs to navigate the difficult situation presented by the global financial crisis. Specifically, the Tier 1 DMBs performed better than the Tier II and foreign DMBs, although they all show improved performances. Additionally, the presence of two bridge banks on the efficiency frontier indicate that the bridge banking model adopted to nurse the troubled DMBs was a success, while the bailout strategy was an ineffectual attempt of breathing life into troubled DMBs.

Conclusively, the efficiency of Nigerian DMBs has been examined under the BCC model. The review of the efficiency of the DMBs relied largely on the efficiency scores of the DMBs that appear on the efficiency frontier though reference where necessary has been made to the efficiency scores of DMBs that did not appear on the efficiency frontier. The absence of the DMBs (DMUs) on the efficiency frontier shows that they were not efficient. Still and all, the BCC efficiency scores have been able to provide adequate information that shed light on the performance of DMBs before and after the both the 2005 and 2009 banking reforms, during and after the global financial crisis, and the adequacy of the adopted financial safety strategies in resolving troubled DMBs. To that end, conclusions that centre on the aims and objectives of this research are addressed below.

5.14 Effects of the 2005 and 2009 Banking Reforms

This study examines the effects of the 2005 and 2009 banking reforms on the performance and efficiency of Nigerian DMBs from 2000 to 2013. The BCC model (variable returns to scale assumption) is relied upon to examine the extent to which the two reforms have impacted on the Nigerian DMBs.

The first three windows consist of the pre-2005 banking reforms years (2001 – 2004), while the year 2005 is in each of the next three windows. Therefore, Window 4 to Window 6 are treated as the 2005 banking reforms era, window 7 as post-2005 banking reforms and pre-2009 banking reforms. Window 8 to Window 10 is the 2009-banking era because the year 2009 is in each of the windows, while window 11 and window 12 are the post-2009 banking reforms period.

Relying on the results of the BCC model, the performance and efficiency of Nigerian DMBs improved over time, although there are windows where efficiency levels plummeted. Efficiency levels dropped in window 2 and immediately rose in window 3 in the pre-2005 banking reforms era. The increase continued in the 2005 banking reforms period in window 4. However, efficiency levels dropped in window 5. The examined years in window 5 are 2004, 2005 and 2006. Nigerian regulators made the pronouncement on July 6, 2004, for DMBs to adhere to the 13-point agenda of the 2005 banking reforms which includes the mandate to recapitalize to the tune of N25bn. The year 2004 is in 3 windows (window 3 – window 5), while the year 2005 is in window 4 – window 6. 2004 has the least amount of DMUs in all the three windows it was reviewed in, which implies there were more efficient DMUs in 2005 when compared to the efficient DMUs in 2004. In similar fashion, the year 2006 is in window 5 – window 7, and it has more efficient DMUs when compared against the efficient DMUs in 2005. The increase in the number of efficient DMUs suggests that DMBs in the Nigerian banking sector reacted positively to the 2005 banking reforms. More so, the percentage of efficient DMUs increased steadily after the 2005 banking reforms (from window 4 – window 8).

Nonetheless, although the aggregate efficiency of the Nigerian banking sector improved in reaction to the 2005 banking reforms, most of the DMBs had efficient scores that were below 100%. DMBs were mandated to raise their regulatory capital to N25bn, and it was achieved through public offers and private placements of stock and consolidation through mergers and acquisitions. The efficiency scores of DMBs in 2005 and the post-2005 banking reforms period shows that DMBs responded differently to the reforms. While some DMBs were able to indicate high levels of efficiency in 2005, while others responded positively in the post-2005 banking reforms period. Relying on the results of the windows that include the year 2005, the efficiency scores of First Bank, Zenith Bank, Oceanic Bank, Intercontinental Bank, IBTC Bank, GTB, and Wema Bank indicate that the 2005 banking reforms had an immediate impact.

The performance of DMBs that improved in 2005 and 2006 cannot singularly be credited to the increase in capital, as only Zenith Bank, GTB, Citibank and Ecobank were not involved in any merger and acquisition during the consolidation exercise. The efficiency scores indicate that the array of mergers and acquisitions that the Nigerian banking sector went through affected the resultant DMBs in different ways. The efficiency scores of some DMBs suggest that the merger and acquisition strategy yielded immediate results, as First Bank, UBA, Wema Bank, Intercontinental Bank and Oceanic Bank were among the best practice DMBs in 2005 and 2006.

Conversely, the proportion of DMBs that were not on the efficiency frontier reveals that 2005 banking reforms did not have the same effect on the performance of all DMBs in the Nigerian banking sector. Consequently, the inability of most of the DMBs to muster efficiency scores of 100% in 2005 and in subsequent years before the 2009 banking reforms could be hinged on the host of activities that ensued to meet the 31 December 2005 deadline. In relation to the mergers and acquisitions that transpired due to the consolidation exercise of the 2005 banking reforms, the less glamorous efficiency scores of some DMBs could be due of the harmonisation of banking IT systems, unification of banking cultures and personnel of merged and acquired banks.

In view of the performance of the different classes of DMBs. The small and medium-sized DMBs and foreign DMBs in the Nigerian banking sector had better efficiency scores in the pre-2005 banking reforms era. While all the DMBs that survived the 2005 banking reforms had N25bn and above as paid-up capital, the DMBs referred to as the large DMBs posted higher efficiency scores in the post-2005 banking era. Also, the foreign DMBs in the also had high-efficiency scores in the post-2005 banking reforms period, although only four foreign DMBs were in operation after the 2005 reforms.

To be concise, the effects of 2005 banking reforms on the performance of DMBs as reviewed in this study suggests that the efficiency level of Nigerian DMBs improved in the post-2005 banking reforms era. Even though efficiency levels did not reach 100% after the 2005 banking reforms, and Nigerian DMBs remained inefficient according to the principles of the DEA frontier technique, the reforms had a positive effect on the general performance of Nigerian DMBs.

The failure of Nigerian DMBs to attain expected efficiency and performance levels led to the 2009 banking reforms. Although the aggregate performance of the banking sector improved

after the 2005 banking reforms, the performance of some DMBs started to plummet after the euphoria of the reforms died down. Similarly, other DMBs never raised their efficiency scores to acceptable levels after the reforms. According to the obtained BCC efficiency scores, the aggregate efficiency of the Nigerian banking sector peaked at 89.83% in window 8 and plummeted to 82.92% in window 9 and this decline continued till window 12 when efficiency levels improved to 85.26%. It is possible that the performance of DMBs did not go on to improve because of the global financial crisis. Moreover, the tenets of the 2005 banking reforms were unable to prevent the plunge in the efficiency scores of the DMBs in the wake of the 2008 global financial crisis. Because the 2005 banking reforms were supposed to protect the Nigerian banking sector from adverse effects of financial and economic crises, the initiative to embark on the 2009 banking reforms suggests flaws in the 2005 banking reforms.

Furthermore, the efficiency scores of some DMBs, especially from 2007, reveal that the gains of the 2005 banking reforms started to erode as some DMBs posted unsatisfactory efficiency scores, hence the 2009 banking reforms. The 2009 banking reforms mandated DMBs with international operations to increase their capital base to N100bn, while National DMBs were to maintain the N25bn capital base and regional DMBs were to have regulatory capital of N10bn. Large DMBs that opted to increase their capital base to N100 are referred to as Tier I banks, while the medium sized National DMBs are referred to as Tier II banks. A review of the performance of individual DMBs indicates that the Tier I banks dominated the efficiency frontier before the 2009 banking reforms and the 2009 banking reforms only further confirmed their dominance in the Nigerian banking sector. While the 2009 banking reforms further ensured the improvement in the efficiency level of Tier I banks, the BCC efficiency scores showed that Tier II banks were less efficient.

Moreover, the efficiency scores in the post-2009 banking reforms era also revealed that foreign DMBs performed poorly. The unsatisfactory efficiency scores of these DMBs were probably due to the adverse effect of the global financial crisis. For instance, the headquarters of Citibank is situated in the United States of America where the global financial crisis took root. And, the operations of Citibank Nigeria were bound to be affected by the activities of mother bank. More so, the likelihood exists that foreign money deposit banks do not completely adhere to the tenets of Nigerian banking reforms due to complications as they also comply with regulations from the host countries of banks' headquarters. As a result, the 2009 banking reforms might not have been able to assist foreign DMBs to navigate the global

financial crisis and survive in the Nigerian banking terrain. Nonetheless, the BCC efficiency scores in window 12 show improvements in the performance of foreign DMBs.

In summary, even though the aggregate performance of the Nigerian banking sector did not reach the 100% efficiency level in all the windows examined, the 2005 and 2009 Nigerian banking reforms had positive effects on the efficiency of individual DMBs. Dwelling on the performance of DMBs that survived the 2005 banking reforms, the BCC model revealed improved efficiency levels across all the classes of DMBs, although not all the DMBs had efficiency scores of 100% in all the windows. The efficiency scores of some DMBs plummeted as the euphoria of the 2005 banking reforms died down and in reaction to the global financial crisis that started in the second half of 2007. Hence, this study suggests that the initiative to embark on the 2009 banking reforms was a step in the right direction as the efficiency scores of DMBs in the post-2009 banking reforms period showed improvements. To be specific, Tier I DMBs performed better than foreign DMBs and Tier II DMBs in the post-2009 banking reforms period. Finally, the two banking reforms had positive effects on the performance of Nigerian DMBs, even though the performance of the entire banking sector suggests that capital regulation alone cannot ensure the continued efficiency of DMBs.

5.15   Global Financial Crisis

This section dwells on the effect of the recent global financial crisis on the efficiency of individual Nigerian DMBs and the banking sector in general. It is hard to flawlessly depend on DEA efficiency scores to ascertain the effect of an event (like the global financial crisis) owing to its reliance on the most efficient frontier. As pointed out in the limitations of the DEA technique, the most efficient frontier in a particular period might not be overtly efficient as it is only the most efficient of the sample. However, the efficiency scores of the DEA window analysis are suitable for this study as they present the analysis of the performance of institutions before, during, and after the global financial crisis.

Regarding the performance of the Nigerian banking sector during the global financial crisis (2007 – 2009), this study examines the effect of the financial crisis in five windows (window 6 – window 10). The aggregate efficiency scores increased in window 6 (BCC – 71.8% to 81.83%). Similarly, the aggregate efficiency level of the banking sector continuously

improved in window 7 i.e. to 85.1% and window 7 consists of two global financial crisis years (2007 and 2008). Impressively, window 9, which consists of the entire global financial crisis period (2007 – 2009), has the highest aggregate efficiency score of 89.83%. In sum, these results suggest that the performance of most DMBs operating in the Nigerian banking sector did not decline during the global financial crisis.

On the other hand, high-efficiency scores could be that the best practice DMB or the most efficient of the set of DMBs is second-rate. If the best practice DMB or the DMBs on the efficiency frontier are not, in reality, efficient, the other inefficient DMBs will appear efficient. If that is the case in the windows that contain the global financial crisis period, then the banking sector was not as efficient as the efficiency scores portrayed. However, the efficiency scores of some DMBs deteriorated during the financial crisis. The eight DMBs that were eventually bailed out revealed inferior efficiency scores during the global financial crisis. Therefore, suggesting that the global financial crisis had a negative impact on the Nigerian banking sector.

More so, the performance of individual DMBs during the global financial crisis and the different classes of DMBs posted mixed results. All DMBs operating in Nigeria had the capacity to operate on the same level after the 2005 banking reforms. The efficiency scores in the post-2005 banking reforms period show that some DMBs lagged behind. Concisely, poor internal risk management practices and the absence of adequate corporate governance guidelines are blamed for the inability of banks to leverage on the increased regulatory capital base to develop into large financial hubs. Consequently, the Tier I DMBs took advantage of the N25bn capital to expand their market share while keeping their risk profiles healthy by efficiently managing their inputs. Other DMBs in the Nigerian banking sector failed to manage their risk positions and adequately utilise inputs which led to their near collapse. The efficiency scores show that the bailed-out DMBs, which were mostly Tier II DMBs, had inferior efficiency scores during the global financial crisis. The BCC efficiency scores of the Tier II DMBs before the global financial crisis were high. Hence, this study opines that the global financial crisis was responsible for the plunge in the efficiency levels of some DMBs that led to their bailout in 2009.

Similarly, the dynamics of the most efficient sets of DMBs changed because of the global financial crisis. An appraisal of the table of efficient DMUs and the efficiency scores, in general, show that foreign DMBs had the most efficient DMUs in windows before the global

financial crisis. Before the global financial crisis period, Citibank, Standard Chartered Bank, and Stanbic IBTC Bank were amongst the most efficient DMBs in the Nigerian banking sector. Nevertheless, their efficiency scores during the global financial crisis (2007 – 2009) were not impressive; as they in most instances dropped off the table of efficient DMUs (DMBs). Therefore, leading to the notion that the global financial crisis negatively affected the efficiency of foreign DMBs more than it affected indigenous Nigerian DMBs.

Furthermore, a review of Table 5.1 (BCC outcome) indicates that the aggregate average efficiency scores plunged in window 10 and window 11. This drop in efficiency levels suggests that the aggregate efficiency levels of Nigerian DMBs fell after the global financial crisis and not during the crisis. Given the analogy made about the performance of the best practice bank in a particular window. It is possible that as the effects of the global financial crisis eased on, the performance of DMBs became more efficient and the best practice bank (efficiency frontier) made less efficient DMBs appear further inefficient. Nevertheless, the results of window 12 show that aggregate efficiency has started to rise, thus suggesting that all classes of DMBs in Nigeria have recovered from the global financial crisis.

In conclusion, the performance of Tier II DMBs and foreign DMBs suggest that the Nigerian banking sector was negatively affected by the event of the global financial crisis. However, the performances of Tier I DMBs (large DMBs) account for the upsurge in the aggregate efficiency level of the banking sector during the crisis.

5.16   Predicting Financial Distress

This study aims to find out if the DEA window technique can predict financial distress in banks, and if it happens to be able to predict financial distress, how far back can it predict financial distress. Using historical annual financial data from 2000 – 2013 to calculate efficiency scores under the BCC model. The results reveal that DEA window analysis was not able to predict financial distress. Nonetheless, it was able to show poor performing or inefficient banking institutions.

The results indicate that the efficiency level of a banking institution can deteriorate or improve within one year. Due to the advantage that the DEA window technique compares the performance of a DMU against its performance in another year or period, it can show the

extent to which the performance of a DMB has improved or deteriorated. Put differently; the DEA window technique can show the efficiency level and performance of banking institutions. On that account, it is a poor financial distress predictor.

The efficiency scores show that the efficiency level of DMBs can change within a single year. For instance, a review of the bailed out DMBs show that Intercontinental Bank had perfect 100% efficiency scores in 2008, but plummeted to 74.34% in 2009 and further fell to 44.87% in 2010. Equally, after posting a 100% BCC efficiency score in 2009 in window 9, the efficiency score of Afribank dropped to 27.19% in 2010. These results indicate that in the whole, the efficiency scores obtained from the DEA window technique can only reveal performance level and not predict possible performance. Therefore, the DEA window method is not appropriate for predicting financial distress based on the examination of Nigerian DMBs.

Nevertheless, the DEA window technique has shown that it is suitable for examining the performance and efficiency of banking institutions. Although this study made use of annual financial statements, regulators can rely on quarterly financial statements to spot relapses in the performance of banking institutions. Therefore, the use of quarterly financial statements can assist regulators in gauging whether the injection of capital, like in the case of the 2009 bailout has improved efficiency and performance.

5.17   Bank Bailouts

The bailout of eight Nigerian DMBs in 2009 by Nigerian regulators was conceived out of the desire to save them from collapse. The CBN and NDIC found eight DMBs to be in danger of collapse, hence the bailout. As discussed in the country context chapter (chapter two), the global financial crisis and other events in the Nigerian financial sector like the 70% collapse of the Nigerian stock market sent waves that affected Nigerian DMBs. The bailed out DMBs include Equitorial Trust Bank, Unity Bank, Finbank, Union Bank, Afribank, Bank PHB, Intercontinental Bank, and Oceanic Bank.

Specifically, the performances of the bailed-out DMBs are reviewed to ascertain the effect of the capital injection on efficiency. The performance of the DMBs in 2009 are analysed in

window 8, window 9, and window 10. The BCC model efficiency scores of the bailed out DMBs revealed mixed results.

Relying on the efficiency scores after the injection of the bailout funds, the efficiency level of Unity Bank, Oceanic Bank and Afribank, improved in 2009 (i.e. in the year the bailout was received), while the efficiency scores of Union Bank, Equitorial Trust Bank, Bank PHB, and Intercontinental Bank did not improve in 2009. Progressively, while Unity Bank was not able to post a 100% efficiency score in 2009, in all the windows 2009 is reviewed. Nonetheless, the efficiency score of Unity Bank rose to 100% in 2010 in Windows 8, 9, and 10. Whereas, the efficiency scores of the other bailed-out DMBs deteriorated to below the 60% in 2010. Moreover, the efficiency scores of the bailed-out DMBs in 2010 and 2011 failed to show positive upward movements. In essence, the bailout strategy did not have a lasting positive effect on the performance and efficiency of the troubled DMBs.

To reinforce the inability of the bailout strategy to turn around the performance of DMBs, four DMB acquisitions involving the bailed out DMBs ensued in 2011. Access Bank acquired Intercontinental Bank; Ecobank acquired Oceanic Bank; FCMB acquired Finbank, and Sterling Bank acquired Equitorial Trust Bank. More so, due to the failure of bailout financial safety net strategy, Bank PHB, and Afribank were nationalised into Bridge banks in 2011. Bank PHB became Keystone Bank Limited, while Afribank became Mainstreet Bank Limited. In sum, this round of acquisitions and the adoption of Bridge banking indicate that the bailout strategy was not an effective strategy, as regulators had to rely on other measures to protect distressed DMBs.

Conversely, not all the bailed-out banks were acquired or nationalised into bridge banks. Nigerian regulators did not rely on other financial safety net measures to nurse Union Bank and Unity Bank. Although the efficiency scores of Union Bank and Unity Bank remained low under the BCC model till 2013 (window 12), the results give the impression they were not in grave danger with regard to the other bailed out DMBs (See Appendix 11 for efficiency scores).

In conclusion, the bailout strategy was a temporary fix. Efficiency levels increased in 2009 in reaction to the capital injection. The 100% efficiency level in some of the bailed-out DMBs was short-lived and at best artificial as DMBs reverted to less impressive efficiency levels the following year. In effect, the bailout strategy failed to turn around distressed DMBs.

5.18 Bridge Banking Mechanism

Three DMBs were nationalised into bridge banks (Afribank became Mainstreet Bank Ltd, Bank PHB became Keystone Bank Ltd, and Spring Bank became Enterprise Bank Ltd). Apart from Spring Bank, Afribank and Bank PHB were bailed out in 2009. The inability of the DMBs (especially the bailed-out DMBs) to improve their risk positions and recover from the event of the global financial crisis led to the adoption of bridge banking mechanism. The efficiency scores of Afribank and Bank PHB (Appendix 11) show that sustained efficiency was not achieved after the injection of the bailout funds. Thus the adoption of the bridge banking strategy was appropriate. The resolution to create Bridge banks was to nurse troubled banks back to health and make them attractive to potential investors. This section, therefore, examines the performance of the three bridge banks.

Relying on the BCC efficiency scores of the three bridge banks, the results indicate that the efficiency scores of all three bridge banks remained low in the year 2011 in window 10, window 11, and window 12. Efficiency levels improved in 2012 across all three windows (10, 11, and 12). However, the level of increase in Enterprise Bank and Mainstreet Bank were weightier to that of Keystone Bank. More so, only Mainstreet Bank achieved an efficiency score of 100% in 2013 (window 12), as Enterprise Bank had an efficiency score of 68.51%, while Keystone Bank came last with an efficiency score of 58.13%.

To conclude, even though the efficiency scores of the bridge banks did not transform instantaneously to depict excellent efficiency levels, the efficiency scores of the bridge banks indicate steady improvements. Therefore, as at 2013, the efficiency scores of the three bridge banks suggest that the bridge banking strategy was effective. Nevertheless, interview submissions and data from CBN and NDIC will address the most recent state of the bridge banks.

5.19 Chapter Conclusion

The DEA window technique was depended upon in this section to examine the performance of Nigerian DMBs from 2000 – 2013. Notably, efficiency scores obtained through the analysis of input/output production level were relied upon to show the effects of the 2005 and

2009 Nigerian banking reforms, and the global financial crisis on Nigerian DMBs within the period of 2000 – 2013. The DEA window technique was also trusted in this study to determine the extent to which the bailout strategy and bridge banking mechanism were able to resolve troubled DMBs in the Nigerian banking sector.

In summary, the results indicate that small or medium sized DMBs and foreign DMBs in the Nigerian-banking sector were more efficient in the windows or years before the 2005 banking reforms. With most DMBs merging in 2005 due to the consolidation exercise, the average performance of the banking institution improved. Therefore, suggesting that the 2005 banking reforms had a positive impact on the Nigerian banking sector. Likewise, even though the aggregate efficiency score suggested that the banking sector remained inefficient, the efficiency scores of individual DMBs indicate improvement in reaction to the 2005 banking reforms.

More so, the efficiency scores after the 2005 banking reforms suggest that DMBs were beginning to settle after the euphoria of the banking consolidation exercise that witnessed several mergers and acquisitions before the episode of the global financial crisis. The inability of DMBs to fully settle down after the 2005 banking reforms due to the timing of the global financial crisis is likely responsible for the decline in the performance and efficiency witnessed in some DMBs.

Furthermore, the efficiency scores obtained from the BCC (variable returns to scale assumption) suggests that the global financial crisis negatively affected the performance and efficiency of the Nigerian DMB. However, the performance and efficiency of some DMBs suffered more loss than others did. For instance, foreign DMBs were more efficient in periods leading to the global financial crisis and even in window 8, which consists of 2007, 2008 and 2009. Nevertheless, the performance and efficiency of foreign DMBs dwindled in subsequent windows (window 9 – window 11). More so, the performances of some medium-sized DMBs were also affected, as Nigerian regulators had to bailout eight distressed DMBs in 2009. On the other hand, Tier I DMBs (large DMBs) particularly fared better as they showed impressive efficiency scores during the global financial crisis.

Regarding the impact of the 2009 banking reforms on the performance of Nigerian DMBs, efficiency scores of some DMBs in the post-2005 banking reforms period suggest that the 2009 reforms were necessary to correct the ills in the Nigerian banking sector. To that end, the 2009 banking reforms were initiated to correct the shortcomings of the 2005 banking

reforms, and it was a response to the global financial crisis. The BCC efficiency scores showed that the 2009 banking reforms had a positive impact on the Nigerian-banking sector; in particular on the performance of Tier I DMBs. However, the 2009 reforms were unable to positively transform the performance of some bailed-out DMBs as regulators had to rely on another set of mergers and acquisitions in 2011 and the nationalisation of three banks into bridge banks. Nonetheless, the last window of the study shows improved efficiency scores in all classes of Nigerian DMBs.

Additionally, the bailout strategy adopted to breathe life into distressed DMBs failed to achieve any meaningful headway. The results of this study in addition to the 2011 mergers and acquisitions lead to the conclusion that the bailout strategy only delayed the inevitable and it was at best ineffectual in resolving distressed DMBs. On the contrary, the efficiency scores of the bridge banks in window 12 suggest that the bridge banking strategy was a more suitable approach of resolving distressed DMBs.

Moreover, the DEA window technique revealed that the efficiency scores of DMBs in Nigeria increases in the year capital requirement is increased, or in the year capital is injected. For instance, the efficiency scores of DMBs surged in reaction to the 2005 banking reforms they were mandated to increase their capital base to N25bn. Similarly, even distressed DMBs appeared to be efficient immediately they received capital injections (bailouts). Therefore, given the performance of DMBs after a year or two of capital injections, this study submits that the continuous efficiency of DMBs is not dependent on the amount of capital requirement or capital injected but on the judicious utilisation of bank inputs and the proper management of liabilities.

Finally, due to the triangulation of research methods in this study, the evaluation of the findings of the DEA window technique in relation to other studies is undertaken after the presentation of multiple regression results and the interpretation of interview responses.

Chapter Six: Multiple Regression Estimation

6.1   Introduction

This chapter focuses on the presentation and interpretation of the regression results of the three regression models employed to ascertain the effects of bank-specific CAMELS variables, bank size, and GDP on bank efficiency, bank performance, and financial stability. On the premise that the 2005 and 2009 banking reforms and the global financial crisis impacted the performance of Nigerian DMBs, regression analysis is first undertaken in four different periods. To this end, the regression analysis is undertaken for the whole period (2000 – 2013), pre-2005 banking reforms period (2000 – 2004), 2005 banking reforms and global financial crisis period (2005 – 2008), and 2009 banking reforms and post-global financial crisis period (2009 – 2013).

Therefore, the adopted efficiency dependent variable (Average annual BCC efficiency scores) is regressed against capital adequacy, asset quality, management quality, earning capacity, liquidity, sensitivity to risk, bank size and GDP (independent variables). While return on assets (ROA) and Z-Score are the proxies for bank performance and financial stability that are also regressed against the adopted independent variables. In addition to the analysis of the determinants of bank efficiency, bank performance, and financial stability in the whole period and the three periods, the robustness of obtained results are examined by introducing dummy variables and the lagging of independent variables.

Furthermore, to ascertain the extent to which the independent variables determine bank efficiency, performance, and stability, the descriptive statistics of adopted variables are first presented. The descriptive statistics of the adopted variables are shown in Table 6.1 below. Thus, the mean (central tendency), standard deviation, minimum and maximum values of the adopted dependent and independent variables are revealed.

6.2 Descriptive Statistics of Variables

Table 6.1: Descriptive Statistics of Variables

Variables	Mean	Std. Dev	Min	Max
DEAWBCC	74.35759	18.32423	20.39	100
ROA	2.832818	2.516225	-8.66	11.08
Z-Score	5.412135	2.798636	-1.91	23.48
ETA	14.88156	7.866008	-2.73	74.77
ILGL	16.18086	14.25303	0.03	85.94
CIR	60.7279	12.69819	16.77	93.02
NIM	8.741127	3.850127	-1.84	23.44
LADSTF	62.1952	23.09577	5.64	99.89
TSTA	21.12851	11.61257	1.79	78.49
SIZENLTA	4.744974	1.521214	0.98	7.93
GDP	8.081633	1.936568	4.3	11.9

Notes: DEAWBCC (Efficiency), ROA (Performance), and Z-Score (Stability) are the dependent variables. While ETA (Capital Adequacy), ILGL (Asset Quality), CIR (Management Quality), NIM (Earning Ability), LADSTF (Liquidity), TSTA (Sensitivity to Risk), SIZENLTA (Bank Size), and GDP growth (Macroeconomic Variable) are the independent variables regressed against the dependent variables.

6.3 Appropriateness Tests (Hausman-Test, Prob F-Test, and Adjusted R-Square)

The fixed effects and random effects panel regression techniques are employed in this study. However, the Hausman-test is used to indicate which of the fixed effects or random effects is appropriate to analyse the effects of the independent variables on the dependent variables.

The Prob F-test is also relied upon to show the appropriateness of the regression models. In instances where the Hausman-test does not show a clear enough distinction between the fixed effects or the random effects, the probability F-test is depended upon to further verify the

appropriateness of the Hausman-test suggestion. The accepted Prob F-Test is <0.05. Hence, only results that fall within the accepted range are considered appropriate to ascertain the determinants of bank efficiency, performance, and stability.

Additionally, the Adjusted R-Sq is also used to determine how well the models measured fit the set of observations. Hence, the Adjusted R-Sq of the most suitable models identified by the Hausman-test and F-test are reviewed to ensure the right model is accepted and comparisons between different periods are carried out with the most suitable results. It is also worth mentioning that the low Adjusted R-Sq is because of the small number of DMBs in the Nigerian banking sector.

Finally, the Adjusted R-Sq, Hausman-test, and F-test of all the regression models are shown in the summary statistics tables of the results below (table 6.2, table 6.3, and table 6.4).

6.3.1 Multicollinearity Tests

In order to ensure the absence of multicollinearity in the independence variables, the Ordinary Least Square (OLS) Variance Inflation Factor (VIF) was used and is reported in each of the regression results tables. The VIF results show the extent to which the presence of multicollinearity inflates the variance of the estimator. The VIF results indicate the absence of multicollinearity problems in the independent variables that could prejudice the regression results.

6.4   Determinants of Bank Efficiency

This section focuses on the analysis of the determinants of bank efficiency. Table 6.2 below displays the summary results of the effects of capital adequacy (ETA), asset quality (ILGL), management quality (CIR), earning ability (NIM), Liquidity (LADSTF), sensitivity to risk (TSTA), size (SIZENLTA), and GDP growth (GDP) on bank efficiency (BCC efficiency scores).

Table 6.2: Base Model: Determinants of Bank Efficiency (Average Annual BCC Efficiency Scores)

Variables	2000 – 2013 Whole Period	2000 – 2004 Pre-2005 Reforms	2005 – 2008 2005 Reforms & GFC	2009 – 2013 2009 Reforms & Post GFC	Expected Sign
Capital Adequacy (ETA)	0.679*** (5.32)	0.872*** (4.85)	0.487* (1.83)	0.695** (2.15)	+
Asset Quality (ILGL)	0.035 (0.51)	0.205** (2.49)	-0.048 (-0.38)	-0.121 (-0.86)	-
Management (CIR)	-0.32*** (-4.74)	-0.342*** (-4.20)	-0.48*** (-2.96)	-0.264** (-2.25)	-
Earnings (NIM)	-0.369 (-1.36)	-0.322 (-1.24)	-0.489 (-0.55)	-0.215 (-0.31)	+
Liquidity (LADSTF)	-0.152*** (-3.77)	-0.33*** (-5.26)	-0.139 (-1.42)	-0.005 (-0.06)	+
Sensitivity to Risk (TSTA)	-0.254*** (-3.32)	-0.223** (-2.24)	-0.179 (-1.24)	-0.256 (-1.63)	+
Size (SIZENLTA)	5.42*** (5.60)	6.301*** (4.09)	6.773*** (3.58)	2.244 (0.87)	+
Gross Domestic Product Growth (GDP)	0.318 (0.96)	0.046 (0.12)	2.089 (0.59)	-0.822 (-1.20)	+
CONSTANT	74.651*** (7.88)	81.07*** (7.81)	65.509* (1.66)	94.746*** (3.99)	
NO of OBS	364	213	74	77	
ADJ R-SQ	0.4183	0.3186	0.3493	0.2008	
PROB (F-STATISTIC)	0.0000	0.0000	0.0000	0.0303	
HAUSMAN-TEST	0.0300	0.2284	0.0006	0.3962	
VIF (MEAN)	1.29	1.27	1.53	1.54	

Notes: Variables are defined in table 4.3. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively; whole period (2000 – 2013) Hausman-Test is <0.05, thus Fixed Effects is accepted, while Random Effects is rejected; Pre-2005 reforms period (2000 – 2004) Hausman-Test is >0.05, thus Fixed Effects is rejected, while Random Effects is accepted; 2005 banking reforms & global financial crisis period (2005 – 2008) Hausman-Test is <0.05, however, F-Test for the Fixed Effects is > 0.05, hence the Hausman-Test is not relied upon, thus the Fixed Effects model is rejected, while the Random Effects model is accepted; 2009 banking reforms & post-global financial crisis period (2009 – 2013) Hausman-Test is >0.5, thus the Fixed Effects is rejected, while Random effect is accepted; OLS VIF (MEAN) shows multicollinearity is absent in all the independent variables and in all the periods.

6.4.1 Impact of Capital Adequacy on Bank Efficiency

Starting with the whole period of 2000 – 2013, the regression result submits that capital adequacy has a positive and statistically significant effect on efficiency. The positive and significant association indicates that capital adequacy influences the efficiency of Nigerian

DMBs. The result implies that as capital adequacy increases, the efficiency of Nigerian DMBs also increases. The pre-2005 banking reforms period (2000 – 2004) results also show a positive and statistically significant relationship between capital adequacy and efficiency. The result also implies that efficiency increases when capital adequacy increases. In addition, the t-value indicates that the effect of capital adequacy on efficiency was more prominent in the pre-2005 banking reforms period than in the other periods. Additionally, the positive and significant relationship could also be explained by the improvement in the average annual efficiency scores of DMBs in the whole period and especially in the pre-2005 banking reforms period when a lot of small DMBs were operating in the Nigerian banking sector.

Turning to the 2005 banking reforms & global financial crisis period, the effect of capital adequacy on efficiency remained positive. However, the significance level plummeted to 10%. The reduced effect of capital adequacy can be ascribed to the event of the global financial crisis, and the restructuring Nigerian DMBs were going through within this period.

Progressively, the association between capital adequacy and efficiency remained positive in the 2009 banking reforms & post-global financial crisis period, although there was an increase in the influence of capital adequacy on efficiency. The results show that statistical significance level of the association increased within this period. The increase in the influence of capital adequacy on efficiency could be because of the 2009 banking reforms elements, which mandated Nigerian DMBs with international operations to increase their regulatory capital to N100bn. In addition, Nigerian regulators in reaction to the global financial crisis to safeguard shareholder's funds within this period outlined new corporate governance guidelines.

6.4.2 Impact of Asset Quality on Bank Efficiency

The ratio of impaired loans to gross loans (ILGL) is the adopted proxy for asset quality. The expected influence of asset quality is negative because an increase should have an opposite impact on efficiency. Beginning with the whole period (2000 – 2013), the results shows a positive but insignificant relationship between asset quality and efficiency. The insignificant relationship implies that level of impaired loans in the whole had no influence on the efficiency of Nigerian DMBs within the entire period of 2000 to 2013.

Conversely, the pre-2005 banking reforms period result shows a positive and significant relationship between asset quality and bank efficiency. The result obtained is contrary to the expected effect of the ratio impaired loans to gross loans (asset quality) should have on efficiency. The result implies that efficiency increased as the ratio of impaired loans to gross loans of Nigerian DMBs increased in the pre-2005 banking reforms period. On that account, it is possible that bank managements within this period that the Nigerian banking sector was comprised of numerous small sized DMBs were able to manage impaired loans which spurred efficiency effectively. More so, this is the only period where the asset quality of Nigerian DMBs had an influence on efficiency. Also, the positive effect of impaired loans to gross loans within this period is responsible for the positive but insignificant result obtained for the whole period of 2000 to 2013.

On the other hand, the relationship between asset quality and bank efficiency in the 2005 banking reforms & global financial crisis period (2005 – 2008) and 2009 banking reforms & post-global financial crisis period (2009 – 2013) is negative but insignificant. The result implies that the asset quality of Nigerian DMBs had no influence on efficiency as the Nigerian banking sector went through reforms and the global financial crisis. To that end, impaired loans discontinued having an effect on the efficiency of Nigerian DMBs after the consolidation exercise of the 2005 banking reforms. Moreover, unlike in the whole period (2000 – 2013) and the pre-2005 banking reforms period (2000 – 2004), the expected negative relationship between asset quality and efficiency is obtained in the 2005 banking reforms & global financial crisis period (2005 – 2008) and 2009 banking reforms & post-global financial crisis period (2009 – 2013).

6.4.3 Impact of Management Quality on Bank Efficiency

The effect of management quality on efficiency is investigated in this section. The cost to income ratio (CIR) is the adopted managerial quality proxy and it shows how well bank executives manage cost in order to generate income.

The result for the whole period (2000 – 2013) shows a negative and statistically significant relationship between management quality and bank efficiency. In like manner, the relationship between management quality and bank efficiency in the pre-2005 banking

reforms period, 2005 banking reforms & global financial crisis period, and 2009 global financial crisis & post-global financial crisis period are also negative and statistically significant. However, the significance level during the 2009 global financial crisis & post-global financial crisis period dropped to 5%. These results denote that when the cost to income ratio of Nigerian DMBs increase, efficiency levels decreased as anticipated. The results also indicate that the influence of management quality on bank efficiency was substantial, aside from the in the 2009 global financial crisis & post-global financial crisis period when there was a slight decline in the influence CIR on efficiency.

6.4.4   Impact of Earnings on Bank Efficiency

This section centres on the impact of the earning ability of Nigerian DMBs on efficiency. Net Interest Margin (NIM) is employed as the proxy for earning ability because it is believed to depict the ability of banking institutions to generate earnings from their assets. Hence, a positive association is projected.

The effect of earning ability on bank efficiency is negative and insignificant in the whole period (2000 – 2013) and the three sub-periods examined in this study. The negative relationship implies that as the earning ability of DMBs decreases, efficiency levels increases and vice versa, however, the earning ability of Nigerian DMBs is not a determinant of efficiency. In sum, the earning ability of Nigerian DMBs does not impact efficiency.

6.4.5   Impact of Liquidity on Bank Efficiency

The impact of liquidity on the efficiency of Nigerian DMBs is reviewed in this section. Liquidity is represented by the ratio of liquid assets to deposit & short-term funding (LADSTF). The higher the ratio of liquid assets to deposit & short-term funding, the less a banking institution is vulnerable to a bank run. Thus a positive association between liquidity and efficiency is expected.

Beginning with the whole period of 2000 – 2013, the coefficient of the liquidity variable is negative and highly significant. The result implies that liquidity influences efficiency and the

negative coefficient infers that as liquidity increases, banking efficiency decreases. The same result is noticed in the pre-2005 banking reforms period as liquidity has a negative and highly significant relationship with efficiency. The influence of liquidity on efficiency in this period accounts for the indicated influence of liquidity on efficiency for the whole period (2000 – 2013). Nonetheless, the diagnosed negative influence was not projected. Therefore, an increase in liquidity in the pre-2005 banking reforms period when there were numerous banking institutions encouraged engagements in operations that hampered efficiency.

In like manner, the relationship between liquidity and efficiency is negative but insignificant in the 2005 banking reforms & global financial crisis period & in the 2009 banking reforms & post-global financial crisis period. This result implies that liquidity ceased to have an influence on efficiency when Nigerian DMBs consolidated in 2005, and the number of banking institutions dropped from 89 to 25. Equally, even though liquidity was not a determinant of efficiency after the Nigerian banking sector went through the 2005 banking reforms, the negative association between liquidity and efficiency suggests that increased liquidity encouraged DMBs to engage in activities that impede efficiency.

6.4.6   Impact of Sensitivity to Risk on Bank Efficiency

This section of the study ascertains the impact of the sensitivity of risk proxy on efficiency. Market forces affect the viability of banks. Thus, the ratio of total securities to total assets (TSTA) is the adopted proxy for sensitivity to risk. A low value of the total securities to total assets ratio is an indication that a bank's reaction towards risk is appropriate. On that account, a negative association between sensitivity to risk and efficiency is projected.

Given the regression results of the whole period (2000 – 2013), sensitivity to risk (TSTA) is statistically significant and has a negative relationship with efficiency. This submission suggests that efficiency increased when Nigerian DMBs were less vulnerable to risk.

In the same vein, the relationship between sensitivity to risk and efficiency in the pre-2005 banking reforms period (2000 – 2004) is negative and significant at 5%. The significance level of the relationship plummeted within this period. Nonetheless, this could be as a result of the value of securities and assets in the pre-2005 banking reforms period which were lower

than those of subsequent sub-periods. Nevertheless, the low value of securities to total assets within the period of 2000 – 2004 denotes that DMBs were less vulnerable to market risk.

Conversely, the regression results of the 2005 banking reforms & global financial crisis period (2005 – 2008) and 2009 banking reforms & post-global financial crisis (2009 – 2013) indicate a negative but insignificant relationship between the sensitivity of Nigerian DMBs to market risk and efficiency. The value of securities and assets of Nigerian banking institutions increased in 2005 and remained relatively high till the episode of the global financial crisis. And even though the value of banking securities plummeted during the global financial crisis and in the 2009 banking reforms & post-global financial crisis period, the ratio of total securities to total assets ceased to determine efficiency in the period the Nigerian banking sector went through the 2005 banking reforms. For this reason, it can be submitted that the influence of sensitivity to risk to determine efficiency diminished when after the consolidation of Nigerian DMBs in 2005 due to the general increase in the value of securities and assets of DMBs.

6.4.7 Impact of Bank Size on Bank Efficiency

Increased bank size is assumed to confer benefits that may increase efficiency, however, bottlenecks not present in small banking institutions may also derail efficiency. On account of the above, the impact of bank size on efficiency could either be positive or negative. Nigerian DMBs were to some extent smaller before the 2005 banking reforms. The consolidation exercise of the 2005 banking reforms resulted in bigger DMBs with more branches, assets, and capital to continue expanding. Similarly, the 2009 banking reforms further promoted the expansion of Tier-I banking institutions by increasing regulatory capital to N100bn for DMBs with international banking operations. To this end, this section of the study examines the effect of bank size on efficiency.

The regression results of the whole period (2000 – 2013) show a positive and highly significant relationship between size and efficiency. This positive and statistically significant result infers that as bank size increased, the efficiency of Nigerian DMBs also increased.

Equally, the results of the pre-2005 banking reforms period (2000 – 2004) and the 2005 banking reforms & GFC period (2005 – 2008) mirrors the result of the whole period, as the

relationship between size and efficiency are also positive and highly significant. These results infer that size was able to determine efficiency when the Nigerian banking sector was largely made up of small sized banking institutions before the 2005 banking reforms and when the banking sector was consolidated into few DMBs. More so, consistent with the DEA results where the efficiency frontier consisted of some large DMBs that were not involved in any form of merger or acquisition during the consolidation exercise of the 2005 reforms, size was able to determine efficiency in the 2005 banking reforms & global financial crisis period. On the account that large DMBs that did not merge or acquire others within the period of 2005 – 2008 were not overwhelmed by post-merger and acquisition issues.

Furthermore, the only period where size was found not to determine efficiency is the 2009 banking reforms & post-global financial crisis period. The relationship between size and efficiency is found to be positive but insignificant. And even though Nigerian DMBs became larger within this period as some of them expanded their activities outside the shores of Nigeria, increased their capital to N100bn or either engaged in some form of merger and acquisition, the obtained result indicates that size was not a determinant of efficiency. Another explanation might be that the event of the global financial crisis reduced the advantage held by large DMBs over smaller DMBs.

6.4.8 Impact of Gross Domestic Product Growth (GDP) on Bank Efficiency

Economic growth and development are believed to impact positively on efficiency and performance. As such, this study examines the impact of GDP growth (adopted macroeconomic variable) on efficiency (BCC efficiency scores).

The regression result for the whole period reveals a positive and insignificant relationship between GDP and efficiency. This result infers that GDP growth was not a determinant of efficiency in the Nigerian banking sector in the entire period of 2000 – 2013. The same insignificant relationship between GDP and efficiency is obtained in the three sub-periods. However, the relationship between GDP and efficiency is positive in the pre-2005 banking reforms periods and the 2005 banking reforms period, while that of the 2009 banking reforms & post-global financial crisis period is negative. In sum, GDP had no influence over the determination of efficiency in the Nigerian banking sector.

6.4.9 Model Extensions

To further verify the factors that determined bank efficiency in the Nigerian banking sector, dummy variables are introduced to particularly ascertain whether the 2005 and 2009 banking reforms affected the efficiency of DMBs. Additionally, all the independent variables are lagged $(t-1)$ to also validate or complement the findings above. Table 6.3 shows the regression results for the whole period (2000 – 2013), the whole period (2000 – 2013) with dummy variables, and the whole period (2000 – 2013) with lagged independent variables.

Table 6.3: Model Extensions: Determinants of Bank Efficiency (Average Annual BCC Efficiency Scores) with Dummy Variables and Lagged Independent Variables

Variables	2000 – 2013 Whole Period (Model 1)	2000 – 2013 Whole Period (With Dummy Variables) (Model 4)	2000 – 2013 Whole Period (With Lagged Variables) (Model 7)	Expected Sign
Capital Adequacy (ETA)	0.679*** (5.32)	0.5854*** (4.27)	0.027 (0.17)	+
Asset Quality (ILGL)	0.035 (0.51)	0.0336 (0.49)	0.010 (0.11)	-
Management (CIR)	-0.32*** (-4.74)	-0.3186*** (-4.74)	-0.108 (-1.21)	-
Earnings (NIM)	-0.369 (-1.36)	-0.2522 (-0.92)	-0.368 (-0.98)	+
Liquidity (LADSTF)	-0.152*** (-3.77)	-0.2321*** (-4.72)	-0.050 (-1.01)	+
Sensitivity to Risk (TSTA)	-0.254*** (-3.32)	-0.2635*** (-3.47)	-0.241** (-2.39)	+
Size (SIZENLTA)	5.42*** (5.60)	5.004*** (3.64)	7.801*** (6.38)	+
Gross Domestic Product Growth (GDP)	0.318 (0.96)	0.2240 (0.67)	0.592 (1.45)	+
Dum1		4.1212 (1.51)		+
Dum2		-3.1791 (-0.81)		+
CONSTANT	74.651*** (7.88)	82.859*** (8.12)	48.696*** (3.85)	
NO of OBS	364	364	303	
ADJ R-SQ	0.4183	0.4759	0.2789	
PROB (F-STATISTIC)	0.0000	0.0000	0.0000	
HAUSMAN-TEST	0.0300	0.0045	0.0005	

Notes: ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively; whole period (2000 – 2013) Hausman-Test is <0.05, thus Fixed Effects is accepted, while Random Effects is rejected; whole period with dummy variables (2000 – 2013) Hausman-Test is <0.05, thus Fixed Effects is accepted, while Random Effects is rejected; whole period with lagged variables (2000 – 2013) Hausman-Test is <0.05, hence Fixed Effects is accepted, while Random Effects is rejected.

The introduction of dummy variables showed similar results in most instances to that of the base model. A positive and significant relationship between capital adequacy and size with efficiency was obtained, while management quality, liquidity, and sensitivity to risk show negative and significant relationships with efficiency. Therefore, efficiency levels increased when capital adequacy and the size of DMB increased, while efficiency levels reduced when management quality, liquidity, and sensitivity to risk increased.

Similarly, earnings, asset quality and GDP had no effect on efficiency in both the base model (model 1) and the model extension with dummy variables (model 4). Hence, suggesting that the revenue accruing to DMBs, the quality of assets, and GDP growth did not determine the efficiency of banking institutions in the Nigerian economy within the period of 2000 - 2013.

Furthermore, the introduction of dummy variables in the model 4 (model extension) is to ascertain the impact of the 2005 and 2009 banking reforms on efficiency. To that end, a positive and significant relationship between the two banking reforms and efficiency was expected. However, the relationship between the 2005 reforms (dummy 1) and bank efficiency is positive but insignificant. This position differs from the average BCC efficiency score which increased in reaction to the 2005 banking reforms. Likewise, interview submissions from regulators and bank executives suggest that the 2005 banking reforms boosted Nigerian DMBs. On the other hand, the possible explanation for the inability of the 2005 banking reforms to impact on efficiency could be the host of mergers and acquisitions that happened in the Nigerian banking sector as DMBs consolidated to avoid being liquidated. More so, the global financial crisis that started in the second half of 2007 could also be a possible reason for the incapacity of the 2005 banking reforms to determine efficiency.

Additionally, the relationship between the 2009 banking reforms (dummy 2) and bank efficiency is negative and insignificant. The result implies that the 2009 banking reforms did not determine the efficiency of Nigerian DMBs even though it had a negative relationship that was not expected. However, the result can be explained by the event of the global financial crisis which affected the efficiency scores of foreign DMBs in the Nigerian banking sector and some DMBs that led their bailout in 2009.

Likewise, the results of model 7 (extended model with lagged independent variables) did not show good enough results for the determination of factors that influenced bank efficiency in the Nigerian banking sector within the period of 2000 – 2013. To that end, the lagging of independent variables to capture the delayed effect of activities that transpired in the Nigerian banking reforms failed to reveal meaningful results. Nonetheless, the significant relationships of sensitivity to risk (negative) and size (positive) and efficiency mirror the results obtained in the base model.

6.4.10 Summary

In a nutshell, capital adequacy (equity to total assets ratio) had a positive effect on efficiency in all the periods examined. More so, impaired loans to gross loans which is the proxy for asset quality was not a determinant of efficiency in the periods the Nigerian banking sector went through the 2005 and 2009 banking reforms and the global financial crisis. The effect of liquidity on efficiency, the association was significant but negative for the whole period and pre-2005 banking reforms period. Additionally, size had a positive impact on efficiency in the whole period, pre-2005 banking reforms period, and 2005 banking reforms period. Finally, the results obtained from the introduction of dummy variables showed that the 2005 and 2009 banking reforms did not have significant effects on the efficiency of DMBs. Also, the lagging of the independent variables to ascertain if there were any delay in the effect of the banking reforms on the efficiency of Nigerian DMBs did not provide convincing results to indicate the determinants of efficiency in the Nigerian banking sector.

6.5   Determinants of Bank Performance

The effects of capital adequacy, asset quality, management quality, earning ability, liquidity, sensitivity to risk, bank size, and GDP on the performance of Nigerian DMBs is examined in this section. The adopted proxy of bank performance is the return on assets (ROA), and is regressed against the above listed independent variables.

In similar fashion, the regression results are reviewed for the whole period (2000 -2013), pre-2005 banking reforms period (2000 – 2004), 2005 banking reforms & global financial crisis period (2005 – 2008), and 2009 banking reforms & post-global financial crisis period (2009 – 2013). The F-Test and Hausman-Test indicate the appropriateness of either the fixed effect or the random effect and the models, and the results are depicted in the notes below table 6.4. The impact of the independent variables on the dependent variable numerically presented in the table below is outlined in the sections of this study further down.

Table 6.4: Base Model: Determinants of Bank Performance (Return on Assets)

Variables	2000 – 2013 Whole Period	2000 – 2004 Pre-2005 Reforms	2005 – 2008 2005 Reforms & GFC	2009 – 2013 2009 Reforms & Post GFC	Expected Sign
Capital Adequacy (ETA)	0.004 (0.32)	0.01 (0.46)	0.028 (1.43)	-0.014 (-0.30)	+
Asset Quality (ILGL)	-0.035*** (-5.07)	-0.03*** (-3.09)	-0.011 (-0.65)	-0.003 (-0.14)	-
Management (CIR)	-0.091*** (-13.27)	-0.105*** (-10.82)	-0.075*** (-4.43)	-0.069*** (-4.46)	-
Earnings (NIM)	0.128*** (5.24)	0.118*** (3.93)	0.095 (0.93)	0.075 (0.85)	+
Liquidity (LADSTF)	0.014*** (3.51)	0.017** (2.27)	0.003 (0.29)	0.022* (1.84)	-
Sensitivity to Risk (TSTA)	0.007 (1.00)	0.001 (0.11)	-0.009 (-0.75)	0.058*** (2.89)	-
Bank Size (SIZENLTA)	-0.353*** (-4.50)	-0.321* (-1.91)	-0.293 (-1.45)	-0.126 (-0.38)	+/-
Gross Domestic Product Growth (GDP)	-0.067* (-1.84)	-0.057 (-1.09)	0.278 (1.24)	-0.012 (-0.13)	+
CONSTANT	9.001*** (10.29)	9.489*** (1.23)	5.522 (1.46)	4.538 (1.51)	
NO of OBS	361	211	74	76	
ADJ R-SQ	0.5781	0.5266	0.6142	0.5080	
PROB (F-STATISTIC)	0.0000	0.0000	0.0003	0.0000	
HAUSMAN-TEST	0.8745	0.4885	0.0015	0.1609	
VIF (MEAN)	1.29	1.27	1.53	1.54	

Notes: Variables are defined in table 4.3. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively; whole period (2000 – 2013) Hausman-Test is >0.05, Fixed Effects is rejected, while Random Effects is accepted; Pre-2005 Banking Reforms Period (2000 – 2004) Hausman-Test is >0.05, Fixed Effects is rejected, while Random Effects is accepted; 2005 Banking Reforms & global financial crisis period (2005 – 2008) Hausman-Test is <0.05, Fixed Effects is accepted, while Random Effects is rejected; 2009 Banking Reforms & Post-Global Financial Crisis (2009 -2013) Hausman-Test is >0.05, Fixed Effects is rejected, while Random Effects is accepted; OLS VIF (MEAN) shows multicollinearity is absent in all the independent variables and in all the periods.

6.5.1 Impact of Capital Adequacy on Bank Performance

Starting with the whole period of 2000 to 2013, the regression results indicate a positive and insignificant relationship between capital adequacy and bank performance. The same result is obtained in the pre-2005 banking reforms period and the 2005 banking reforms & global financial crisis period. While the relationship between capital adequacy and bank performance in the 2009 banking reforms & post-global financial crisis period is negative but

also insignificant like in all the other periods. Nonetheless, the results of the whole period and the three sub-periods indicate that though regulatory capital was increased in 2005 and 2009 in the Nigerian banking sector, capital adequacy is not a determinant of performance.

6.5.2 Impact of Asset Quality on Bank Performance

The impact of asset quality (ILGL) on bank performance (ROA) is examined in this section. Starting with the regression results obtained for the whole period (2000 – 2013), the association between asset quality and bank performance is negative and statistically significant. This implies that as the ratio of impaired loans to gross loans decreases, bank performance increases and vice versa. This result is replicated in the pre-2005 banking reforms period as the effect of asset quality on bank performance stayed negative and statistically significant. Banking institutions were not capitalised enough to grant numerous loans/credits in the pre-2005 banking reforms period which could mean that DMBs were not weighed down huge non-performing loans within this period. However, the significance of the relationship between asset quality and bank performance infers that asset quality determined bank performance within the period of 2000 – 2004. More so, the result of pre-2005 banking reforms period accounts largely for the significant relationship obtained in the regression result of the whole period. To that end, a review of the entire sub-periods shows that that impact of the level of impaired loans to gross loans in the pre-2005 banking reforms period accounts largely for the significant impact of asset quality on performance denoted in the whole period of 2000 – 2013.

In view of the above, the association between asset quality and bank performance is negative but insignificant in the 2005 banking reforms & global financial crisis period and the 2009 banking reforms & post-global financial crisis period. Regulatory reports submitted that there was a build-up of non-performing loans in the Nigerian banking sector after the 2005 banking reforms, yet the results indicate that asset quality had no effect on the performance of DMBs within the period of 2005 – 2013.

6.5.3   Impact of Management Quality on Bank Performance

This section examines the effect of cost to income ratio (CIR) the adopted proxy for management quality on bank performance (ROA). In similar fashion with previous sections, presented in this section are the regression results for the whole study period (2000 – 2013), and the sub-periods of the pre-2005 banking reforms period (2000 – 2004), 2005 banking reforms & global financial crisis period (2005 – 2008), and the 2009 banking reforms & post global financial crisis period (2009 – 2013).

Foremost, the relationship between management quality and bank performance for the whole period is negative and statistically significant. The result implies that as the cost to income ratio of DMB increases the performance of DMBs decreases and vice versa. Literature opines that banking institutions take fewer risks when management are strict and are not adventurous. On that account, this result suggests that management quality had an effect on the performance of DMBs in the whole.

More so, the same negative and statistically significant relationship between management quality and bank performance are observed in the three sub-periods. These results also imply that as the cost to income ratio of banking institutions increased, their performance decreased. In addition, cost to income ratio is significant and negatively related to performance in the Nigerian banking sector as investments in inputs is indicated to have not translated to improvements in performance. As such, the expected impact of the cost to income ratio, which is the adopted proxy for management quality on performance, is observed in all the reviewed periods.

6.5.4   Impact of Earnings on Bank Performance

Net interest margin (NIM) is the adopted proxy for the earning ability of Nigerian DMBs. This section explores the effect of the earning ability of Nigerian DMBs on performance (ROA).

The regression results of the whole period and that of the pre-2005 banking reforms period indicate a positive and statistically significant relationship between the earning ability of Nigerian DMBs and bank performance. These results infer that as the earning ability of

DMBs increased, their performance also increased. Hence, the results of the pre-2005 banking reforms period also suggest that the relatively large number and small size of Nigerian DMBs within this period made it possible for earnings to have an effect on performance.

Conversely, though the effect of earning ability on bank performance remained positive in both the 2005 banking reforms & global financial crisis period and the 2009 banking reforms & post-global financial crisis period, earning ability is not a determinant of bank performance. Hence it can be opined that the ability of earnings to determine performance plunged as the size of Nigerian DMBs increased in reaction to the consolidation exercise of the 2005 banking reforms.

6.5.5 Impact of Liquidity on Bank Performance

The adopted liquidity proxy for this study is the ratio of liquid assets to deposit & short-term funding (LADSTF). The higher the ratio, the more liquid a bank is said to be and the less vulnerable it is to a bank run. Therefore, the relationship between liquidity and bank performance (ROA) is projected to be positive.

In view of the whole period (2000 – 2013), the relationship between liquidity and bank performance is positive and statistically significant. This result implies that as the liquidity levels of DMBs increase the performance of the DMBs also increases. In like manner, the effect of liquidity on bank performance is also positive and but at a lower level of significance in the pre-2005 banking reforms period. This result infers that as liquidity increases, bank performance also increases but not in tandem due to the 5% significance level.

On the other hand, the relationship between liquidity (LADSTF) and performance in the 2005 banking reforms & global financial crisis period (2005 – 2008) is positive but not significant. This result implies that liquidity was not a determinant of bank performance in the Nigerian-banking sector during the 2005 banking reforms and the global financial crisis that started in the second half of 2007. This result could be due to the fact that all DMBs in the Nigerian banking sector had increased liquidity levels in line with the mandate of the 2005 banking reforms that all DMBs increase their capital to N25bn. Improved liquidity levels in the entire

banking sector meant liquidity shortage ceased to be an issue. Thus, liquidity became insignificant to determine bank performance within this period.

Furthermore, the regression result of the 2009 banking reforms & post-global financial crisis period indicates a positive and slightly significant relationship between liquidity and performance. This result implies that as liquidity increases, the performance of DMBs also slightly increases. Eight DMBs suffered liquidity problems and were bailed-out in 2009, while DMBs with international operations were mandated to increase their regulatory capital to N100bn. This indicates that with the disparity in capital levels and the widening gap in liquidity available to DMBs in line with the elements of the 2009 banking reforms, the influence of liquidity in the determination of performance re-emerged.

6.5.6 Impact of Sensitivity to Risk on Bank Performance

The association between the sensitivity of Nigerian DMBs to risk and bank performance is explored in this section of the thesis. It is worth noting that ROA (dependable variable) is the adopted proxy for bank performance, while the ratio of total securities to total assets (TSTA) is the proxy for sensitivity to risk. A negative relationship is projected, given the view that a high value of the ratio of total securities to total assets is an indication that the banks' portfolios are vulnerable to risk.

The relationship between sensitivity to risk and bank performance is positive but insignificant in the whole period and the pre-2005 banking reforms period. These results suggest that the sensitivity of DMBs to market risk was not a determinant of bank performance in the whole period and in the pre-2005 banking reforms period when the Nigerian banking sector had numerous DMBs that were relatively small in size. However, even though the effect of sensitivity to risk on bank performance was insignificant, the observed positive effect was not consistent with the projected negative effect.

More so, the regression results of the sub-period of 2005 – 2008 (2005 banking reforms & global financial crisis period indicates a negative relationship between the sensitivity of Nigerian DMBs to risk and performance that is not significant. The negative coefficient suggests that as the vulnerability of Nigerian DMBs to market risk decreased, bank performance increased. Nonetheless, the negative effect on bank performance is rather

insignificant. To that end, the sensitivity of Nigerian DMBs to risk had no effect on performance in the period the Nigerian DMBs went through the 2005 banking reforms and the global financial crisis.

Conversely, the results of the final sub-period of 2009 – 2013 (2009 banking reforms & post-global financial crisis period) show a positive and statistically significant relationship between sensitivity to risk and bank performance. Just like the results of the whole period and pre-2005 banking reforms period, the observed positive effect is contrary to the projected negative association of sensitivity to risk and bank performance. Therefore suggesting that an increase in the vulnerability of Nigerian DMBs to risk also leads to an increase in bank performance. This submission is in line with the notion that higher risk translates into higher profits. In sum, the result indicates as the vulnerability of Nigerian DMBs to risk increased probably due to the elements of the 2009 banking reforms and post global financial crisis DMBs managed their risk position in ways that translated into increased performance.

6.5.7 Impact of Bank Size on Bank Performance

This section of the study aims to find out the effect of bank size on the performance of Nigerian DMBs. Inflation-adjusted (Consumer Price Index) natural logarithm of total assets is the proxy for bank size in this research. Size affects banking institutions in diverse ways, and as such, the relationship between the size Nigerian DMBs to bank performance (ROA) could be either positive or negative.

Given the relationship between bank size and bank performance, the result of the whole period (2000 – 2013) indicates a negative and significant association. The result implies that when the size of Nigerian DMBs increases, performance decreases and vice versa. Put simply, bank size and bank performance move in opposite directions. Furthermore, the association of bank size and performance is also negative but slightly significant (10%) in the pre-2005 banking reforms. Nigerian DMBs were relatively small in this period, and the regression results show that bank size had more influence on performance in this period than in the other sub-periods.

Moreover, the regression results of the 2005 banking reforms & global financial crisis period and 2009 banking reforms & post-global financial crisis period indicate the same results. The

results indicate a negative and insignificant association between size and performance. In essence, this result opines that size ceased to have an effect on bank performance after the consolidation exercise of the 2005 banking reforms which created 25 large banking institutions with boosted capital and assets and increased branch network. It is likely that the wide-ranging developments in all the banking institutions that survived the 2005 banking reforms rendered size ineffective to determine performance.

6.5.8 Impact of Gross Domestic Product Growth (GDP) on Bank Performance

This section presents the regression results that explore the extent to which GDP growth influences bank performance (ROA) in the Nigerian banking sector.

In view of the whole period of $2000 - 2013$, GDP has a negative effect on bank performance, and the association between GDP growth and bank performance is slightly significant at 10%. Hence implying that as GDP decreases, bank performance increases and vice versa. Therefore, the influence exerted by GDP growth on bank performance in the Nigerian banking sector over the period of $2000 - 2013$ was meagre.

Conversely, the regression results of the three sub-periods show insignificant relationships between GDP and bank performance. The impact of GDP on bank performance in the pre-2005 banking reforms period and 2009 banking reforms & post-global financial crisis period is negative, while that of the 2005 banking reforms & global financial crisis period is positive. However, no matter the sign of the coefficient, GDP growth was not a determinant of bank performance in the three sub-periods examined independently.

6.5.9 Model Extensions

To further validate the factors that determined bank performance in the Nigerian banking sector, dummy variables are introduced to particularly ascertain whether the 2005 and 2009 banking reforms affected the performance of DMBs. Additionally, all the independent variables are lagged $(t - 1)$ to also corroborate or complement the findings above. Table 6.5 shows the regression results for the whole period $(2000 - 2013)$, the whole period $(2000 -$

2013) with dummy variables, and the whole period (2000 – 2013) with lagged independent variables.

Table 6.5: Model Extensions: Determinants of Bank Performance (ROA) with Dummy Variables and Lagged Independent Variables

Variables	2000 – 2013 Whole Period (Model 2)	2000 – 2013 Whole Period (With Dummy Variables) (Model 5)	2000 – 2013 Whole Period (With Lagged Variables) (model 8)	Expected Sign
Capital Adequacy (ETA)	0.004 (0.32)	0.0146 (1.00)	0.019 (0.87)	+
Asset Quality (ILGL)	-0.035*** (-5.07)	-0.0343*** (-5.0)	-0.015 (-1.29)	-
Management (CIR)	-0.091*** (-13.27)	-0.0892*** (-12.99)	-0.039*** (-3.28)	-
Earnings (NIM)	0.128*** (5.24)	0.1208*** (4.85)	0.046 (0.90)	+
Liquidity (LADSTF)	0.014*** (3.51)	0.0101** (2.01)	0.010 (1.51)	-
Sensitivity to Risk (TSTA)	0.007 (1.00)	0.0089 (1.18)	-0.033** (-2.41)	-
Size (SIZENLTA)	-0.353*** (-4.50)	-0.2108* (-1.84)	-0.435*** (-2.67)	+/-
Gross Domestic Product Growth (GDP)	-0.067* (-1.84)	-0.0819** (-2.19)	-0.039 (-0.71)	+
Dum1		-0.3862 (-1.34)		+
Dum2		-0.7648* (-1.90)		+
CONSTANT	9.001*** (10.29)	8.7331*** (9.26)	7.517*** (4.43)	
NO of OBS	361	361	301	
ADJ R-SQ	0.5781	0.5786	0.2988	
PROB (F-STATISTIC)	0.0000	0.0000	0.0000	
HAUSMAN-TEST	0.8745	0.8592	0.0143	

Notes: ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively; whole period (2000 – 2013) Hausman-Test is >0.05, Fixed Effects is rejected, while Random Effects is accepted; whole period with dummy variables Hausman-Test is >0.05, Fixed Effects is rejected, while Random Effects is accepted; whole period with lagged variables Hausman-Test <0.05, thus Fixed Effects is accepted, while Random Effects is rejected.

As suggested in previous sections, the extension of the base models is to confirm the obtained results further when dummy variables that depict the 2005 and 2009 banking reforms are introduced and when the independent variables are lagged by one year (t − 1). On that account, the regression results of model 5 (extended model with dummy variables) recorded

the same results with model 2 (base regression model) in some instances. The relationship between bank performance and earnings and liquidity are shown to be positive and significant in the base model and the extended model with dummy variables. The results imply that the performance of Nigerian DMBs increases when earnings and liquidity level of DMBs increase. Asset quality, management quality, size and GDP, on the other hand, indicated negative and significant associations with bank performance. Conversely, size was significant at 1% in the base model but 10% significant in the extended model with dummy variables. Equally, GDP which had a negative and 10% significant relationship with bank performance in the base regression model (model 2) showed an increase (5%) in its significance level with the introduction of dummies.

Particularly, the dummy variables were introduced to ascertain the effects of the 2005 and 2009 banking reforms on bank performance. Although positive associations were expected between the dummy variables and bank performance, the regression results show negative associations. The association between the 2005 banking reforms is not significant, while that of the 2009 banking reforms is slightly significant. The negative and insignificant relationship between the 2005 banking reforms and bank performance is not consistent with the interview submissions that suggest that the 2005 reforms impelled bank performance. Nevertheless, the inability of the 2005 banking reforms to influence bank performance may be related to the wholesome transformations that DMBs went through during the 2005 banking reforms. On the other hand, the negative and significant relationship between the bank performance and the 2009 banking reforms could be linked to the event of the global financial crisis and the bailout of eight DMBs in 2009 in the Nigerian banking sector.

Furthermore, the lagging of the independent variables (model 8) shows insignificant relationships between bank performance and capital adequacy, asset quality, earnings, liquidity, and GDP. However, just like the results of Model 2 and Model 5 (Table 6.5) the regression results of model 8 show negative and significant relationships between bank performance and management quality, and size. Consequently, the lagged proxies of capital adequacy, asset quality, earnings, liquidity, and GDP did not influence bank performance, even though asset quality, earnings, liquidity were determinants of bank performance in the base model (model 2) and the extended model with dummy variables (model 5). Conversely, sensitivity to risk is only significant in the extended model with lagged independent variables (model 8). The relationship between bank performance and sensitivity to risk in model 8 implies that as the sensitivity to risk decreases, the performance of Nigerian DMBs increases.

Conclusively, the inconsistent results of model 8 (extended model with lagged independent variables) suggest that the lagging of the independent variables did not produce the anticipated results. On that account, the delayed effects of the independent variables on bank performance are not relied upon to make inferences in this study. On the other hand, the consistency of the results of model 5 (extended model with dummy variables) validates the results of model 2. Hence, conclusions are drawn from the regression results of the base model (model 2).

6.5.10 Summary

In sum, impaired loans (proxy for asset quality) had a negative and significant effect on performance in the whole period and pre-2005 banking reforms period. The effect of cost to income ratio (management quality) was diagnosed to have a negative impact on performance as expected in the whole period and the three sub-periods. While NIM (earnings) was found to have a significant and positive association with performance in the whole period and pre-2005 banking reforms period. In like manner, liquidity was found to have a positive and significant effect on performance in the whole period and pre-2005 banking period. This study found that liquidity resurfaced as a determinant of performance in the 2009 banking reforms & post-global financial crisis. The effect of liquidity on performance in the 2009 banking reforms & post-global financial crisis period could be down to the increase in the regulatory capital of DMBs with international operations from N25bn to N100bn and the retracting effect of the global financial crisis. Furthermore, even though a negative relationship was projected, the effect of sensitivity to market risk on performance was found to be positive and highly significant in the 2009 banking reforms & post-global financial crisis period. Size was diagnosed to have a negative and significant effect on performance in the whole period and pre-2005 banking reforms period. While on the other hand, size failed to impact on performance in subsequent periods as Nigerian DMBs became bigger in reaction to the consolidation exercise of the 2005 banking reforms. Equally, GDP is shown to have a slight negative effect on performance in the whole period, while it has no effect on performance in all the sub-periods. Finally, the base models were extended to include dummy variables that proxy the 2005 and 2009 banking reforms and the independent variables were lagged to ascertain their delayed effects on bank performance. The two dummy variables did

not show significant influences on bank performance, while the extended model with the lagged independent variables indicated inconsistent results.

6.6   Determinants of Financial Stability

This section investigates the determinants of financial stability in the Nigerian banking sector within the period of 2000 – 2013. The investigation is directed to ascertaining the determinants of financial stability in relation to the 2005 and 2009 banking reforms, and the global financial crisis. The proxy for financial stability adopted for this study is the Z-score. Hence, the Z-score is regressed against proxies for asset quality, management quality, earning ability, liquidity, sensitivity to risk, bank size, and the macroeconomic indicator of GDP.

In like manner, the regression analysis is undertaken for four periods: the whole period of the study (2000 – 2013); pre-2005 banking reforms period (2000 – 2004); 2005 banking reforms & global financial crisis period (2005 – 2008); 2009 banking reforms & post-global financial crisis period (2009 – 2013). The F-Test and Hausman-Test indicate the appropriateness of either the fixed effect or the random effect and the models, and the results are depicted in the notes below table 6.6.

Table 6.6: Base Model: Determinants of Financial Stability (Z-score)

Variables	2000 – 2013 Whole Period	2000 – 2004 Pre-2005 Reforms	2005 – 2008 2005 Reforms & GFC	2009 – 2013 2009 Reforms & Post GFC	Expected Sign
Asset Quality (ILGL)	-0.012 (-1.15)	-0.015 (-1.45)	-0.03 (-1.58)	-0.012 (-0.63)	-
Management (CIR)	-0.05*** (-4.92)	-0.039*** (-3.83)	-0.074*** (-3.14)	-0.047*** (-2.81)	-
Earnings (NIM)	0.163*** (4.05)	0.158*** (5.15)	0.306** (2.35)	0.251** (2.59)	+
Liquidity (LADSTF)	0.007 (1.16)	0.019** (2.37)	0.006 (0.43)	0.006 (0.48)	+
Sensitivity to Market Risk (TSTA)	0.012 (0.98)	-0.008 (-0.65)	0.044** (2.10)	0.01 (0.40)	-
Size (SIZENLTA)	0.299** (2.04)	-1.13*** (-6.65)	-0.878*** (-3.33)	-0.718* (-1.64)	+/-
Gross Domestic Product Growth (GDP)	0.177*** (3.59)	0.12** (2.42)	-0.751 (-1.44)	0.255*** (2.93)	+/-
CONSTANT	3.655** (2.51)	8.44*** (6.87)	18.97*** (3.44)	8.866** (2.31)	
NO of OBS	364	212	74	78	
ADJ R-SQ	0.1455	0.3555	0.5014	0.2659	
PROB (F-STATISTIC)	0.0000	0.0000	0.0000	0.0000	
HAUSMAN- TEST	0.0018	0.0587	0.0553	0.0000	
VIF (MEAN)	1.29	1.14	1.38	1.48	

Notes: Variables are defined in table 4.3. ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively; whole period (2000 – 2013) Hausman-Test is <0.5, Fixed Effect is accepted, while Random Effect is rejected; Pre-2005 Banking Reforms period (2000 – 2004) Hausman-test is >0.5, Fixed Effect is rejected, while Random Effect is accepted; 2005 Banking Reforms & Global Financial Crisis period (2005 – 2008) Hausman-Test is >0.05, Fixed Effect is rejected, while Random Effect is accepted; 2009 banking Reforms & Post-Global Financial Crisis period (2009 – 2013) Hausman-Test is <0.05, Fixed Effect is rejected, while Random Effects is accepted because of the low and negative Adjusted R-Sq of Fixed Effect model (-0.0188); OLS VIF (MEAN) shows multicollinearity is absent in all the independent variables and in all the periods.

6.6.1 Impact of Asset Quality on Financial Stability

The regression results of the impact of asset quality (ILGL) on financial stability (Z-score) are presented in this section.

Just like in other sections, this section starts with the review of the regression results of the whole period (2000 – 2013). The relationship between asset quality and financial stability is negative and statistically insignificant in the Nigerian banking sector within the period of

2000 – 2013. Equally, the same negative and insignificant effect of asset quality on financial stability is observed in the pre-2005 banking reforms period, 2005 banking reforms & global financial crisis, and the 2009 banking reforms & post-global financial crisis period. To that end, it can be suggested that the level of impaired loans in the Nigerian banking sector was not a determinant of stability even as Nigerian DMBs went through the global financial crisis.

6.6.2 Impact of Management Quality on Financial Stability

This section of the research explores the impact of the quality of management on financial stability. The cost to income ratio is the proxy for management quality, while the Z-score remains the proxy for financial stability in this study. A negative relationship between management quality (CIR) and financial stability is expected.

The regression results of the whole period (2000 – 2013) and those of the three sub-periods indicate a negative and statistically significant relationship between management quality and financial stability. This relationship implies that as the cost to income ratio of Nigerian DMBs increases, financial stability decreases and vice versa. Additionally, this diagnosis indicates that stability is enhanced in the Nigerian banking sector when costs of inputs are adequately managed and kept low. On that account, the events of the 2005 and 2009 banking reforms, and the episode of the global financial crisis did not change the impact of management quality (CIR) on financial stability.

6.6.3 Impact of Earnings on Financial Stability

This section of the thesis dwells on the effect of the earning capacity of Nigerian DMBs on financial stability. In line with previous sections, the effect of the earning capacity of Nigerian DMBs on financial stability is x-rayed in the whole study period (2000 – 2013), the pre-2005 banking reforms period (2000 – 2004), the 2005 banking reforms & global financial crisis period (2005 – 2008), and the 2009 banking reforms & post-global financial crisis period (2009 – 2013). The net interest margin (NIM) is the adopted proxy for earnings, and a positive impact on financial stability is expected because the higher the NIM of a banking institution, the higher is its earning margin.

The regression results of the whole period and pre-2005 banking reforms period indicate a positive and statistically high significant relationship between the earning ability of DMBs and financial stability. The results imply that financial stability increases when the earnings of Nigerian DMBs increase. To that end, the effect of the earning ability of Nigerian DMBs on financial stability depicted in the whole period is largely because of the impact of the earning ability of Nigerian DMBs in the pre-2005 banking reforms period.

Equally, the relationship between the earning ability of DMBs and financial stability in the 2005 banking reforms & global financial crisis period, and 2009 banking reforms & post-global financial crisis period is positive and slightly less significant than in the pre-2005 banking period. Thus suggesting that the earning margin of Nigerian DMBs continued to be a determinant of financial stability in the periods the Nigerian banking sector went through the 2005 and 2009 banking reforms and the global financial crisis. It can also be opined that the impact of earnings on the determination of financial stability marginally dwindled after the consolidation exercise of the 2005 banking reforms.

6.6.4   Impact of Liquidity on Financial Stability

The proxy for liquidity in this study is the ratio of liquid assets to deposits & short-term funding (LADSTF). The results of liquidity regressed against financial stability (Z-score) are examined in this section of the study. Liquidity is expected to have a positive impact on financial stability as increased liquidity ensures banking institutions carry out their intermediation activities without setbacks.

The regression results show a positive but insignificant relationship between liquidity and financial stability for the whole period (2000 – 2013). This outcome indicates that liquidity was not a determinant of financial stability.

Turning to the pre-2005 banking reforms period, a positive and 5% significant relationship exist between liquidity and financial stability. The positive coefficient infers that as liquidity levels increased in the pre-2005 banking reforms period, financial stability also increased. Therefore, liquidity had an effect on financial stability when the banking institutions were relatively small, and liquidity was not available as it was in subsequent issues following the consolidation exercise of the 2005 banking reforms.

Moving on to consider the 2005-banking reforms & global financial crisis period (2005 – 2008), the fixed effects regression results show a positive and insignificant relationship between liquidity and financial stability. This result suggests that liquidity did not determine financial stability during the period the bank went through the 2005 banking reforms and the core of the global financial crisis. Additionally, all the DMBs that survived the 2005 banking reforms went through the consolidation exercise and had increased liquidity levels, and they were all exposed to the global financial crisis. The inability of liquidity to determine financial stability could be because all the DMBs within this period went through the same reforms and the global financial crisis.

Furthermore, a positive and 10% significant relationship exists between liquidity and financial stability in the 2009 banking reforms & post-global financial crisis period. The positive coefficient submits that as liquidity increases, financial stability also slightly increases. The liquidity levels of DMBs were affected by the episode of the global financial crisis and the elements of the 2009 banking reforms enhanced some DMBs to have greater access to liquidity. The variance in liquidity levels could, therefore, be responsible for the positive and statistically effect of liquidity on financial stability within the period of 2009 – 2013.

6.6.5 Impact of Sensitivity to Risk on Financial Stability

The proxy for sensitivity to risk is the ratio of total securities to total assets (TSTA). This section centres on uncovering the effects of the sensitivity to market risk on financial stability. A negative relationship is projected because a high ratio indicates that a banking institution is vulnerable to risk.

The relationship between sensitivity to risk and financial stability is positive but insignificant in the whole period (2000 – 2013). However, although the relationship between sensitivity to risk and financial stability is insignificant, the effect obtained is not the expected one.

Turning to the pre-2005 banking reforms period (2000 – 2004), the association between sensitivity to market risk and financial stability is also insignificant but negative as projected. This result reveals that the sensitivity of Nigerian DMBs to risk was not a determinant of

financial stability in the period where numerous small banking institutions dominated the Nigerian banking sector.

Furthermore, the effect of sensitivity to risks on financial stability for the 2005 banking reforms & global financial crisis period (2005 – 2008) is positive and 5% significant. This result implies that as sensitivity to market risk increased within the period of 2005- 2008, financial stability increased. Though financial stability is expected to reduce the vulnerability to market risk increased, this result suggests otherwise. Therefore, Nigerian DMBs became more vulnerable to risk due to the shrinking of the number of banking institutions; however the benefits that accrued to banking institutions as a result of 2005 banking reforms probably propelled an increase in the stability of DMBs.

In reverse to the results above, the regression results of the 2009 banking reforms & post-global financial crisis period denote a positive and insignificant association between the sensitivity of Nigerian DMBs to risk and financial stability. This result suggests that the 2009 banking reforms ceased to impact on the stability of Nigerian DMBs. Additionally, the regression result of this period mirrors the result of the whole period (2000 – 2013), which also suggested that the vulnerability of Nigerian DMBs to risk did not determine financial stability.

6.6.6 Impact of Bank Size on Financial Stability

The effect of the size of Nigerian DMBs on financial stability is the focus of this section. In line with previous sections, the regression results for the whole period (2000 – 2013), the pre-2005 banking reforms period (2000 – 2004), the 2005 banking reforms & global financial crisis period (2005 – 2008), and the 2009 banking reforms & post-global financial crisis period (2009 – 2013) are examined. The association between size and stability could either be negative or positive in line with the submissions presented in the

Commencing with the whole period, the regression results show a positive and 5% statistically significant relationship between the size of Nigerian DMBs and financial stability. Thus, implying that as the size of Nigerian banking institutions increases, financial stability also increases and vice versa.

Conversely, though highly significant, the relationship between size and stability is negative in both the pre-2005 banking reforms period and 2005 banking reforms & global financial crisis period. The results of both periods indicate that as the size of banking institutions increased, within 2000 – 2008, stability decreased. Hence, size and stability move in opposite directions.

In like manner, the relationship between bank size and financial stability in the 2009 banking reforms & post-global financial crisis period is equally negative but less significant than it was in the previous sub-periods. This implies that the increase in the size of DMBs in line with elements of the 2009 Nigerian banking reforms translated to a slight decrease in stability. Just like the previous sub-periods, this result differs from the result obtained for the whole period, which holds that size has a positive and (10%) a significant effect on stability. Therefore, the slight effect obtained in the 2009 banking reforms & post-global financial crisis most likely tilted towards indicating a positive impact of size on stability as some Nigerian DMBs became bigger given the N100bn regulatory capital for DMBs with international operations.

6.6.7   Impact of Gross Domestic Product Growth (GDP) on Financial Stability

The effect of GDP on financial stability is the focus of this section. In like manner to the effect of size on financial stability addressed above, the effect of GDP growth could also be either positively or negatively associated with financial stability.

Beginning with the whole period of 2000 – 2013, the regression result shows a positive and statistically significant relationship between GDP and financial stability. This result implies that as GDP increases, financial stability also increases. Similarly, the regression result of the pre-2005 banking reforms period indicates a positive but 5% significant association between GDP and financial stability. This result implies that the influence of GDP growth on financial stability was not as substantial as it is depicted in the whole period. The influence of GDP growth was possibly not highly significant because the contribution of the Nigerian banking sector to GDP growth was meagre in the pre-2005 banking reforms period.

On the other hand, the regression results of the 2005 banking reforms & global financial crisis period show a negative but insignificant relationship between GDP growth and

financial stability. This result infers that GDP did not influence the stability of banking institutions as the banking sector went through the 2005 banking reforms and the global financial crisis.

In total reverse, the regression result of the 2009 banking reforms & post-global financial crisis period shows a positive and statistically significant association between GDP and financial stability. This implies that as GDP improves in the Nigerian economy, stability also improves. The contribution of Nigerian DMBs to GDP growth increased after the 2005 banking reforms as banks continuously increased in size. It is therefore in view of this that GDP within the period of 2009 – 2013 is a determinant of financial stability.

6.6.8   Model Extensions

To further verify the factors that determined financial stability in the Nigerian banking sector, dummy variables are introduced to particularly ascertain whether the 2005 and 2009 banking reforms affected the stability of DMBs. Also, all the independent variables are lagged $(t – 1)$ to validate or complement the findings above. Table 6.7 shows the regression results for the whole period (2000 – 2013), the whole period (2000 – 2013) with dummy variables, and the whole period (2000 – 2013) with lagged independent variables.

Table 6.7: Model Extensions: Determinants of Financial Stability (Z-Scores) with Dummy Variables and Lagged Independent Variables

Variables	2000 – 2013 Whole Period (Model 3)	2000 – 2013 Whole Period (With Dummy Variables) (Model 6)	2000 – 2013 Whole Period (With Lagged Variables) (Model 9)	Expected Sign
Asset Quality (ILGL)	-0.012 (-1.15)	-0.017 (-1.65)	-0.019 (-1.61)	-
Management (CIR)	-0.050*** (-4.92)	-0.054*** (-5.55)	-0.035*** (-2.69)	-
Earnings (NIM)	0.163*** (4.05)	0.202*** (5.28)	0.062 (1.13)	+
Liquidity (LADSTF)	0.007 (1.16)	0.002 (0.28)	0.007 (0.96)	+
Sensitivity to Risk (TSTA)	0.012 (0.98)	0.001 (0.37)	0.012 (0.81)	-
Size (SIZENLTA)	0.299** (2.04)	-0.461** (-2.33)	0.534*** (3.03)	+/-
Gross Domestic Product Growth (GDP)	0.177*** (3.59)	0.160*** (3.40)	0.255*** (4.40)	+/-
Dum1		2.283*** (6.22)		+
Dum2		1.852*** (3.37)		+
CONSTANT	3.655** (2.51)	7.034*** (4.81)	1.880 (1.03)	
NO of OBS	364	364	304	
ADJ R-SQ	0.1455	0.3771	0.0046	
PROB (F-STATISTIC)	0.0000	0.0000	0.0000	
HAUSMAN-TEST	0.0018	0.0071	0.0000	

Notes: ***, **, and * denote statistical significance at 1%, 5%, and 10% respectively; whole period (2000 – 2013) Hausman-Test is <0.5, Fixed Effect is accepted, while Random Effect is rejected; whole period (2000 – 2013) with dummy variables Hausman-Test is >0.05, Fixed Effects is accepted, while Random Effect is rejected; whole period (2000 – 2013) with lagged variables Hausman-Test is <0.05, Fixed Effect is accepted, while Random Effect is rejected.

Regarding the results displayed in Table 6.7, model 6 (extended model with dummy variables) indicated similar significant results with model 3 in three instances. The similar significant results are the relationship between financial stability and management (negative and significant), and earnings and GDP (positive and significant). The results imply that the stability of DMBs dwindles when management quality increases, while stability surges when DMBs generate more earnings, and there is an increase in the GDP of the Nigerian economy.

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More so, just like in the base model (model 3), asset quality, liquidity, and sensitivity to risk are not significant determinants of financial stability in model 6 (extended model with dummy variables). Furthermore, size has a positive and 5% significant relationship with financial stability in the base model (model 3) but shows a reverse negative and 5% significant relationship in model 6 (extended model with dummy variables). The negative and significant relationship suggests that financial stability decreases when the size of DMBs increases. The result is not consistent with the views expressed by interview respondents that submitted that Nigerian DMBs became better as they increased in size.

As regards the effect of the dummy variables on financial stability, unlike in previous extended models (model 4 and model 5), the indicators of both the 2005 and 2009 reforms show positive effects on the dependent variable (in this case, financial stability). Dummy 1 (2005 banking reforms) has a positive and significant relationship with financial stability. The result is consistent with interview submissions and the average BCC efficiency scores of the DEA window technique which showed positive improvements in reaction to the 2005 banking reforms. More so, the positive and significant relationship between the 2005 banking reforms and financial stability indicates that the 2005 reforms protected the Nigerian banking sector from the adverse effect of the global financial crisis as no banking institution in Nigerian collapsed.

In like manner, the association between dummy 2 (2009 banking reforms) and financial stability is positive and significant. The 2009 banking reforms was a reaction to the global financial crisis, and it was designed to promote financial stability. To that end, the positive and highly significant relationship between the 2009 banking reforms and financial stability suggest that the objective of the reforms were met. These results could have been boosted by the intervention of Nigerian regulators to bailout eight troubled DMBs in 2009 to prevent their collapse which may well have derailed the stability of the Nigerian banking sector. Additionally, the nationalisation of three DMBs using the bridge banking mechanism in 2011 to prevent their collapse was an initiative by Nigerian regulators to ensure financial stability.

In furtherance of the verification of the determinants of financial stability, lagged (t - 1) independent variables (model extension 9) are used. The significant effect of management quality (negative), size (positive) and GDP (positive) align with the results of the base model (model 3). The results imply that financial stability decreases when management quality increases, while financial stability increases when the size of DMBs increases and the GDP

of the Nigerian economy improves. Equally, asset quality, earnings, liquidity, and sensitivity to risk are not indicators of financial stability (extended model 9 with lagged independent variables). However, the insignificant relationships between the proxies of asset quality, liquidity, and sensitivity to risk align with those of the base model (model 3).

Finally, only a handful of the results of the extended models (model 6 and model 9) do not tally with those of the base model. Interestingly, the relationship between the dummy variables (2005 and 2009 banking reforms) and financial stability are positive and significant. Hence, in line with submissions expressed by the BCC efficiency scores and the responses from bank executives, the 2005 and 2009 banking reforms ensured the stability of Nigerian DMBs.

6.6.9 Summary

To round up this section, a summary of the impact of the independent variables on financial stability is presented. The cost to income ratio (CIR), which is the proxy for asset quality, is negative and significant in all the examined periods. Likewise, earnings are diagnosed also to determine financial stability as it has a positive and significant association in all the periods. Furthermore, liquidity was only positive and significant in the pre-2005 banking reforms period. In like manner, total securities to total assets (sensitivity to market risk) only had an effect in the 2005 banking reforms & global financial crisis period. Bank size was found to be a determinant of financial stability in all the examined periods; however, the results obtained suggest that the influence was highest in the 2005 banking reforms and global financial crisis. Equally, GDP was shown to have positively impacted financial stability in all the periods except within the period of 2005 – 2008 when the Nigerian banking sector went through the 2005 banking reforms and global financial crisis. Finally, the introduction of the dummy variables as model extensions suggest that both the 2005 and 2009 banking reforms positively influenced the stability of Nigerian DMBs.

6.7   Chapter Conclusion

This chapter explored the determinants of bank efficiency, bank performance, and financial stability in the Nigerian-banking sector for the whole period of 2000 – 2013, the pre-2005 banking reforms period (2000 – 2004), the 2005 banking reforms & global financial crisis period (2005 – 2008), and the 2009 banking reforms & post-global financial crisis period (2009 – 2013). Panel data regression was adopted, while the Hausman-Test specified the most suitable variant of either the fixed effects or random effects models. The adjusted R-Sq displayed in the tables further show the suitability of the models and the variance inflation factor of the independent variable indicate the absence of multicollinearity. Diverse effects of capital adequacy, asset quality, management quality, earnings capacity, liquidity, sensitivity to risk, bank size, and GDP on bank efficiency, bank performance, and financial stability were uncovered throughout the chapter. The results obtained indicate diverse reactions of Nigerian DMBs to the 2005 banking reforms, 2009 banking reforms and the event of the global financial crisis. Additionally, the introduction of dummy variables as proxies of the 2005 and 2009 banking reforms suggest that the reforms significantly increased financial stability, while the results obtained are less conclusive in terms of the effects of the reforms on bank efficiency and performance. Finally, due to the nature of this study (mixed methods), the findings of this chapter are harmonised with the findings from the DEA window analysis and the content analyses of interview responses before further conclusions are drawn in the discussion chapter.

Chapter Seven: Content Analysis

7.1   Introduction

This chapter presents the analysis of interview responses from regulatory authorities and senior bank officials. The analysis of interview responses is carried out using content analysis with quotations from interviewees. Data obtained from the financial stability reports of the CBN and the annual reports of the NDIC are utilised where necessary. The responses analysed dwell on salient issues that quantitative data is unlikely to address, while also complementing and clarifying the findings from the quantitative techniques employed in this study. Additionally, apart from shedding light on regulatory and supervisory processes in the Nigerian banking sector and highlighting the issues that plagued Nigerian deposit money banks (DMBs) as they went through the 2005 and 2009 banking reforms and the global financial crisis, the interview responses validates and complements findings obtained from the DEA window analysis and the multiple regression analysis.

The reactions analysed in this study centre on the submissions of banking executives from DMBs that survived the consolidation exercise of the 2005 banking reforms and the mergers and acquisitions that ensued in the aftermath of the global financial crisis. This study acknowledges that the opinion of banking executives and staff of DMBs that ceased to exist because of the reforms and resolution initiatives of Nigerian bank regulators might differ to those presented throughout this chapter. Nonetheless, the view of banking executives and staff of DMBs that no longer exist may be biased and not up-to-date. On that account, the analysis of their views is outside the scope of this study.

Therefore, in order to arrive at valid and reliable conclusions, the analysis of the reactions put forward by bank regulators and senior bank officials in this chapter is centred on the main areas of this research: banking regulation and supervision, global financial crisis, regulatory reforms initiatives, financial safety nets, and financial stability in general. The interview questions and the institution of the respondents that guide the analysis of reactions are presented in tables.

7.2   Banking Regulation and Supervision (Banking Reforms)

7.2.1   2005 Banking Reforms

Research Interview Questions	Interviewee Institution
Where the objectives of the 2005 banking reforms achieved?	CBN/NDIC
How successful was the 2005 banking consolidation reforms?	Deposit Money Banks (DMBs)
What impact did the 2005 banking consolidation reforms have on your bank?	Deposit Money Banks (DMBs)

The questions above were put forward in order to qualitatively ascertain how banking regulation and supervision affected bank performance and banking stability in Nigeria. The responses obtained dwell on the effect the banking reform had on the entire banking sector and how individual banks were able to cope with the tenets of the reform programme.

7.2.1.1   Objectives of the 2005 Banking Reforms

The objectives of the 2005 banking consolidation reforms have been presented in earlier sections of this study. As a result, this work sought the views of regulators to ascertain whether the objectives of this reform were achieved. As initiators of the various elements of the reform, which was mainly geared towards having banks with higher capital levels and consequently, a stable banking system, this study is of the view that regulators would offer better reactions. The responses obtained from both regulatory institutions offered a unanimous opinion. The respondents were both of the opinion that the objectives of the 2005 banking reforms in terms of recapitalization were met. The respondent from the CBN (Director of Banking Supervision) put forward that:

> *"All the banks that emerged after the 2005 banking reforms had shareholders' funds (capital) at a minimum of N25 billion."*

In like manner, the senior research officer of the NDIC submitted that:

> *"The deposit money banks became stronger and bigger because they all had more capital after the 2005 banking reforms programme."*

The above views from the CBN and NDIC both agreed that the objectives of the banking reforms were achieved. A review of all the basic elements of the 2005 reforms revealed that to some extent, not all the elements of the reforms were achieved. On the surface, visible evidence largely indicates that the 2005 banking reforms were a success because time has passed and information flow is centred only on the banks that met the minimum capital requirement and those that consolidated through mergers and acquisitions to attain the minimum N25 Billion survived. For instance, one element of the 2005 banking reforms which was the establishment of an 'Asset Management Company' as a tool for resolving troubled banks was not given adequate attention. To that end, the establishment of the Asset Management Corporation of Nigeria, which was an integral part of the 2005 banking reforms, was neglected until after the global financial crisis and the 2009 banking reforms. According to the AMCON website, the 'Asset Management Corporation of Nigeria (AMCON) was established on the 19th of July 2010 with the signing of the AMCON Act into Law by the then President of the Federal Republic of Nigeria'. This reveals that priority was accorded to increasing the capital base of banks as opposed to keeping them sound and stable.

Still, on the 2005 banking reforms, the perception of bank executives was sought in order to validate the reactions obtained from regulators concerning the success of the 2005 banking reforms. In line with submissions from the regulatory agencies, all the senior bank managers interviewed suggested that the reform was a success. Below are few submissions to support the view that the objectives of the reform were achieved:

> *"The 2005 banking reforms was a massive success as it led to the increase in the capital base of banks, even though some banks were unable to forge merger and acquisition agreements to stay afloat."*

> *"With the increase in the capital base of banks made possible by the 2005 banking reforms, Nigerian banks had the capacity to lend to other sectors of the Nigerian economy like the agriculture and real estate sectors."*

> *"The N25 billion capital base revamped the Nigerian banking industry. The recapitalization exercise opened up Nigerian banks to new possibilities within and outside the country. The banks were able to finance some projects, which they previously could not finance. This also*

laid the foundation for further capital injections because some banks presently have N300 billion as capital base. The banking consolidation reform was a template for further growth."

"Since the 2005 banking reforms, no bank has failed due to the high capital base all the banks now possess. The reform also ushered in a level playing ground for all banks."

The submissions obtained from the fifteen (15) DMB executives point to the positives occasioned by the consolidation reform. Most importantly, all the interviewees agreed that the increase in the capital base of Nigerian DMBs affected them positively, even though the effect of the impact differed as a result of the experience of the DMBs during the recapitalization period. For instance, since most of the surviving banks either merged or were acquired, the first submission differed from the rest as it mentioned that some banks did not survive the recapitalization exercise of the 2005 banking reforms. Secondly, ten out of the fifteen interviewees hinted that apart from increasing the capital base of banking institutions, the reform ensured that banks had the capacity to lend to other sectors of the economy. This indicates that the 2005 banking reforms made it possible for Nigerian banks to properly function as financial intermediaries, while also encouraging the growth of other sectors of the Nigerian economy. Thirdly, two respondents opined that the 2005 banking reforms were a springboard for further recapitalizations as some Nigerian banks now have capital of up to N300 billion. Finally, a senior bank executive from one of the Tier II DMBs opined that the recapitalization exercise of the 2005 banking reforms led to an increase in bank competition as the reform fostered a scenario where all banks could operate and compete on a level playing ground. In summary, all the interviewed senior bank executives are of the view that the 2005 banking reform was a success.

7.2.1.2   Impact of the 2005 Banking Reforms

Progressively, this study also seeks to ascertain the impact of the 2005 banking reforms on individual DMBs. Away from the fact that the surviving DMBs after the 2005 reforms had their capital base fortified, how did this impact on the position and operations of the DMBs? This study aims to find out what the surviving DMBs went through to increase their capital base and how the increase in capital affected the operational capability of the banks. The general view as obtained from the fifteen respondents was that the banks became stronger and formidable. However, various reactions highlighted important issues as to how the reforms impacted on individual DMBs.

First and foremost, the main element of the 2005 reforms was the recapitalization of Nigerian banks, as Nigerian banks were mandated to increase their capital base from N2 billion to N25 billion. Hence Nigerian DMBs had to raise capital from various sources. In reaction to the question on how the 2005 banking reforms impacted on Nigerian DMBs, a senior bank executive from one of the Tier I DMBs in the Nigerian banking sector highlighted the rigorous process the bank went through in order to adhere to the components of the 2005 banking reforms.

> *"The bank had to raise funds from various sources in order to increase its capital base to the minimum requirement. The bank had to sell shares to staff and investors on the Nigerian Stock Exchange and it also offered shares at a discount to existing shareholders through right issues and private placements."*

This submission denotes that the banking reforms led to an increase in the number of shareholders in Nigerian DMBs. This submission also indicates that there was an increase in the number of banks soliciting to raise funds from the Nigerian Stock Exchange. And in order to raise funds from the Stock Exchange, the banks had to be listed. Thus the reform led to the listing of banks on the Nigerian Stock Exchange. In a nutshell, the recapitalization exercise of the 2005 banking reforms led to an increase in market capitalization of the Nigerian Stock Exchange.

More so, some banks merged and also raised capital from the Nigerian Stock Exchange. A senior bank (Tier II) executive that experienced the entire process asserted that:

> *"The bank went through a difficult merger, as the Central Bank of Nigeria had to approve the coming together of nine (9) banks to form a single entity. The merger process was hectic and rigorous because of the number of merging banks. The merger also meant that the new bank could not accommodate all the top management personnel of the merging banks and most of them were relieved of their jobs before the CBN approved the new management team. And after the merger agreement was approved, the bank offered its shares on the Nigerian Stock Exchange Market in order to raise additional capital to meet the minimum capital requirement of N25 billion."*

In view of the above assertion, the interviewee suggested that the merger process was far from a pleasant one. The coming together of nine banks will sure present challenges as banks have different cultures and use different software packages. More so, the entire harmonization of systems was expected to be seamless to ensure that customers are satisfied throughout the entire merger process. The submission also indicated that the regulatory agencies in the Nigerian banking sector had to approve the merger and the management team of the resulting bank. Additionally, the bank also raised capital from the Nigerian Stock

Exchange Market. In sum, the process of ensuring the survival of the merging banks as a single entity was cumbersome, even though the end result was positive.

Additionally, another bank executive from a DMB that also went through the merger process due to the need to fulfil the elements of the 2005 banking reforms offered a different account to show the impact of the banking consolidation reform on his bank. He submitted that:

> *"The bank was involved in a merger that changed the core of the bank. The bank was referred to as an old generation bank and it merged with another bank that was referred to as a new generation bank. The name of the old generation bank was retained because the public had a good perception of the bank but most of the management team came from the new generation bank. This merger led to rapid changes in terms of banking services, banking applications and banking structures as most of the archaic ways of doing things in the old bank were jettisoned. In simple terms, the banking consolidation exercise made the bank bigger, better and more efficient."*

The above view presents another merger scenario prompted by the 2005 banking reforms in the Nigerian banking sector. The submission shows that the core of the banking institution underwent noteworthy changes due to the merger of two different types of banks. On a sad note, the management of the old generation bank made way for the management of the new generation bank. However, the move is hinted to be progressive as the merger spurred growth and innovation due to the availability of funds. And in sum, the interviewee suggested that the 2005 banking reforms impacted positively on the bank as it became bigger, better and more efficient.

More so, due to the various merger agreements and the availability of capital, banking institutions had access to resources for growth and expansion. Therefore, in line with previous submissions, another bank manager highlighted the impact of the 2005 banking reforms as follows:

> *"The fortunes of the bank changed after meeting the N25 billion minimum capital base. The reform led to an increase in branch network which correspondingly led to an increase in banking job opportunities."*

In relation to the above notion, with ample funds for investment at their disposal, Nigerian banks had the ability to increase their branch network. This is a positive impact as increased branch network can foster financial inclusion. Resultantly, the increase in bank branch network led to an increase in job opportunities which should have a positive influence on the rate of unemployment in the Nigerian economy.

Furthermore, contrary to the previous reactions which have so far dwelled on the views from banks that merged and also raised capital from the Nigerian Stock Exchange Market, a senior bank executive from one of the Tier I DMBs that did not merge with any other bank during the recapitalization exercise of the 2005 banking reforms held that:

> *"The 2005 banking consolidation reforms further strengthened the bank and made it one of the largest and most profitable in the country."*

The responses from the bank executive above contributed to the positive perception of 2005 banking reforms. It reveals that whether a bank merged or not during the banking consolidation exercise, the reforms fortified banks and made them stronger. In relation to other banks, the senior bank executive from the bank above suggested that the reforms made it one of the largest and most profitable DMBs in Nigeria. However, this claim cannot be substantiated at the moment, perhaps other analysis techniques will reveal such. More so, the response indicates that even if DMBs had a minimum capital base of N25 billion, their profit levels after the reforms also depended on the characteristics of the bank before the reforms. For instance, a big DMB will likely be able to price its shares higher than a smaller bank on the stock exchange market; hence the bigger bank will be able to raise more capital.

Similarly, another interviewee from one of the big banks in the Nigerian banking industry asserted that:

> *"The reform had a great impact on the bank as the increase in the capital base ensured that the bank became stronger, formidable, efficient and reliable. As a result, the bank was able to contribute to the growth of the Nigerian economy due to its increased availability of funds to lend to its customers from different sectors of the economy."*

In line with the submissions that dwell on the positive impact of the 2005 banking reforms, the above reaction indicates that consequent on the increased capital base, DMBs were able to lend to their customers. More so, the submission also opines that increased lending to bank customers was not only beneficial to bank customers but to the Nigerian economy at large. The above reaction summarizes the position of all the bank executives interviewed. In conclusion, evidence obtained from the interview participants hold that the 2005 banking reforms was successful and impacted positively on individual DMBs and the Nigerian economy in the whole.

Despite the positive reactions and the glowing praises attached to the 2005 banking reforms, Nigerian deposit money banks went through another set of reforms in 2009 to correct the growing ills in the Nigerian banking industry. Therefore, the section below will try to

uncover what went wrong and whether the elements of the 2005 banking reforms were not adequate enough to set the banking sector on a path of stability.

7.2.3   2009 Banking Reforms

Research Interview Questions	Interviewee Institution
If the 2005 banking reforms was a success, why did regulators embark on the 2009 banking reforms?	CBN/NDIC
What was the main rationale for the 2009 banking reforms?	CBN/NDIC
Where the objectives of the 2009 banking reforms achieved?	CBN/NDIC
What was the effect of the 2009 banking reforms on your bank?	Deposit Money Banks (DMBs)

This section dwells on the 2009 Nigerian banking reforms. The questions above will guide the analysis below as the submissions of participants on the rationale, objectives, and effects of the 2009 banking reforms are presented.

7.2.3.1   Rationale of the 2009 Banking Reforms

Until now, there has been a general consensus by interviewees that the 2005 banking reform was a success and the objectives set out by the regulatory agencies were achieved. However, the Nigerian banking sector went through another set of reforms in 2009. The short period between the 2005 and 2009 banking reforms argues that the 2005 banking reforms was either not properly designed or it was inadequate to handle the global financial crisis. To this end, the perception of bank regulators regarding this position was demanded.

The reaction presented by the representative of the CBN reaffirmed the view that the 2005 banking reforms were a success and that the rationale for the 2009 banking reform was informed by the following:

> *"The Global financial crisis and recession; macroeconomic instability caused by large and sudden capital outflows; major failures in corporate governance in banks; lack of investor and consumer sophistication; inadequate disclosure and transparency about the financial position of banks; and weaknesses in the business environment."*

Likewise, the response from the NDIC offered a similar view with the above assertion from the CBN. The interviewee opined that:

> *"The 2009 reform was necessary due to the combined effect of the global financial crisis and specific risks in the Nigerian banking industry."*

The responses indicate that apart from the global financial crisis and weaknesses in the business environment, which was beyond the control of regulators in Nigeria, lapses in regulation and supervision formed a block of the issues in the banking industry. Banking regulation was not able to curb failures in corporate governance in banks and ensure adequate disclosure and transparency in the banking industry. More so, lack of investor and consumer sophistication is an indication of minimal private sector involvement in bank monitoring. In essence, the elements of the 2005 banking reforms were deficient in scope as it failed to address important issues such as corporate governance, financial disclosure, and financial safety nets initiatives.

Even though the rationale of the 2009 banking reforms have been spelt out in various regulatory documents and in the country context chapter, this study sought to find out devoid of the 2005 banking reforms, the main rationale for initiating the reform. In line with the financial stability reports of the CBN, the respondent from the CBN, in summary, presented the main rationale for the 2009 banking reform as follows:

> *"To enhance the quality of banks; establish financial stability; enable healthy financial sector evolution, and ensure the financial sector contributes to the real economy."*

The submission from the CBN indicates that the central focus of the 2009 banking reforms was the promotion of financial stability by improving the capacity of banking institutions to adequately perform their roles as financial intermediaries without fear of failure. In sum, the above response offers a general view to the rationale of the 2009 banking reform. However, the submission put forward by the NDIC respondent offers a more focused reaction. The interviewee from the NDIC thus asserted that:

> *"The reason the CBN initiated the 2009 banking reform was because bank examinations found out that some banks were undercapitalised, and even distressed. Their capitals were eroded and they could not be allowed to continue operating. In addition, the contagion of the global financial crisis had more or less affected the Nigerian banking sector."*

The response from the NDIC opines that the fortunes of Nigerian DMBs depreciated in the years after the 2005 banking reforms. The submission shows that the intervention in the form of the 2009 banking reforms was necessary to prevent some DMBs from going under which to a large extent would have led to widespread instability in the banking sector. Additionally, the reaction points out that the rationale of the 2009 banking reforms cannot be separated from the event of the global financial crisis.

7.2.3.2   Objectives of the 2009 Banking Reforms

This section tries to ascertain the extent to which the objectives of the 2009 banking reforms were achieved. The consensus perception from the CBN and NDIC is that the objectives of the reforms have been achieved and the banking industry has been set on path of growth and stability. In line with the view that the 2009 reform was a success, the interviewee from NDIC declared that:

> *"The objectives of the 2009 banking reforms have been achieved. The banking system has been acknowledged to be healthy both within and outside Nigeria. Most importantly, all the toxic assets and non-performing loans in the system have been removed and deposit money banks have been able to continue their intermediation role of providing capital and loans for economic growth."*

In as much as the regulatory authorities opine that the reforms were a success, it should be noted that the components of the reforms originated from them, and thus the reaction obtained to the effect of the reforms might be subjective. However, the other data techniques (DEA window analysis and multiple regression analysis) adopted in this study sheds more light on the impact of the 2009 banking reforms on bank efficiency, performance, and stability.

7.2.3.3   Impact of the 2009 Banking Reforms on Deposit Money Banks (DMBs)

Continuously, the view of senior bank managers was sought in order to ascertain the impact of the 2009 banking reforms on the general operations and structure of individual DMBs. The managers offered different opinions bordering on the impact of the reforms. However, the responses show that regulatory authorities had to take some hard decisions in order to protect bank customers and the Nigerian banking sector.

A senior manager of one of the banks that was negatively affected by the regulatory reforms asserted that:

> *"Our bank lost heavily to margin facility exposures in the Nigerian stock market which was badly affected as well. The reforms led to the removal of our CEO and the management of the bank by the CBN, and the bank was later acquired by AMCON before it was subsequently nationalized."*

Similarly, seven CEOs and their management teams suffered the same fate with the example presented above. However, only two more banks were also acquired by AMCON and later nationalized into bridge banks. In summary, a total of eight bank CEOs and their management teams were removed by the CBN, and three out of the eight banks were found to be grievously undercapitalised. As a result, the three banks were acquired by AMCON and later nationalized as bridge banks.

More so, in responding to the impact of the 2009 banking reforms on DMBs, another senior bank manager suggested that:

> *"The 2008 stress test carried out by the CBN and NDIC found out that the capital base of the bank was far below the N25bn capital base requirement for national deposit money banks. To that end, the bank was downgraded to a regional bank in line with the 2009 bank reforms guidelines."*

The new banking model put forward by the 2009 banking reforms made provisions for regional banks with a minimum capital requirement of N10bn. The submission above indicates that the N25bn raised by the bank during the 2005 banking reforms was lost. The downgrading of the bank to the status of a regional bank meant that the bank had to close its operations in North-Central, North-West, North-East, South-East, and South-South regions of Nigeria. Hence, the bank only maintained its operations in the South Western part of Nigeria. Although the bank lost its National license, the downgrading of the bank to a regional bank highlights the resolve of Nigerian regulators in ensuring financial stability and preventing

bank runs. More so, the downgrading of the DMB was also a way of ensuring the continuous existence of the bank.

In reverse to the above view, the 2009 banking reforms served as a springboard for other DMBs to increase their capital base and be upgraded to International banks. A senior bank manager from one of the National DMBs that increased its capital to the status of an International bank suggested that:

> *"The 2009 banking reforms created an enabling environment for the bank to raise additional capital. Although the bank continuously increased its capital after the 2005 banking reforms, the bank increased its capital to N100bn in line with the new banking model of the 2009 banking reforms in order to be classified as an International bank."*

The above view indicates that even though some DMBs had the option of remaining National DMBs, the new banking model that allowed DMBs with regulatory capital of N100bn and above to operate outside the shores of Nigeria spurred DMBs to increase their capital base.

Furthermore, not all the DMBs in the Nigerian banking sector could raise additional capital in accordance with the guidelines of the 2009 banking reforms to International banking status. A large portion of the DMBs increased their capital from the N25bn requirement prescribed in the 2005 banking reforms. Hence, in moving away from the negative experience of some DMBs, the responses below highlight the positive impact of the 2009 banking reforms on individual DMBs. The quotes below summarise the position held by most of the interviewees from DBMs that were not found to be in distress by the 2008 stress test conducted by the CBN and NDIC. As such, the interviewees were pleased with the components of the 2009 banking reforms and what it ushered, and opined that it heralded growth and stability. Two senior bank managers stated that:

> *"The 2009 banking reforms made the bank stronger in terms of capital base which reinforced the confidence of customers in the bank."*

> *"The reforms were positive as it provided the bank with more capital to expand its branch network, invest in ICT, and lend to borrowers."*

The above reactions indicate that the 2009 banking reforms were positioned to enable DMBs to become better, more competitive and stable. More so, the increase in the capital base of International DMBs meant that they were adequately equipped to function in other jurisdictions without endangering the deposits of Nigerian depositors.

Conclusively, the varying reactions to a large extent show that DMBs that engaged in good banking practices had the opportunity of consolidating on their positions to become International DMBs. While DMBs that were found with eroded capital levels most likely engaged in unhealthy practices that hampered their growth and progress. Progressively, the responses above point to the episode of the global financial crisis as one of the rationales for the 2009 banking reforms. Hence, the section below dwells on the effect of the global financial crisis that started in the second half of 2007 on the performance of DMBs and the Nigerian banking sector in the whole.

7.3 Effects of the Global Financial Crisis

Research Interview Questions	Interviewee Institution
How were Nigerian Deposit Money Banks affected by the global financial crisis?	CBN/NDIC
How was your bank affected by the global financial crisis that started in the second half of 2007?	Deposit Money Banks (DMBs)
Do you think Nigerian Deposit Money Banks were affected by derivative transactions during the global financial crisis?	Deposit Money Banks (DMBs)

This section dwells on the effects of the global financial crisis on the performance of Nigerian DMBs. The global financial crisis is central to this study for the reason that it started just after the 2005 Nigerian banking reforms when DMBs were settling in due to the host of mergers and acquisition that transpired and the euphoria that engulfed the banking sector because of the N25bn minimum capital requirement. To this end, in order to ascertain the effects of the crisis on Nigerian DMBs, views from both regulatory authorities and Nigerian DMBs were solicited.

The global financial crisis originated in the USA but its effect was felt the world over as a result of the increased level of interaction between financial systems and economies. Nigerian regulatory authorities were relied upon to comment on the general impact of the global financial crisis on the Nigerian banking sector. In responding to the question of how Nigerian DMBs were affected by the crisis, the interviewee from NDIC opined that:

> "Nigerian DMBs were affected by the global financial crisis through: (1) terminal channels, (2) direct relations with foreign banks, (3) trading with clients of foreign banks who had trading relationships with partners that were hit by the global financial crisis; (4) trading with partners in countries that were affected by the crisis, and (5) foreign investors that invested in the country."

While the interviewee from the CBN similarly opined that:

> "Nigerian banks were affected through (1) reversal of capital inflows; (2) decline in stock market capitalization; (3) erosion of banks' shareholder's funds; (4) inability to create new credits; and (5) increase in the level of non-performing loans."

In relation to the above assertions, the global financial crisis had multiple effects on the Nigerian banking sector and the Nigerian economy as a whole. The views from both the CBN and NDIC agree that the global financial crisis adversely affected the Nigerian banking sector. More so, the responses validate the assertion that the global financial crisis was a major rationale for the 2009 banking reforms. In like manner, the responses also highlight the dangers of foreign investments in Nigerian banking institutions as foreign investors and partners recalled their investments when the banking sector was contending with the global financial crisis. This happened because foreign partners and investors had to call back their loans and investments in the Nigerian banking sector to cushion the effect of the crisis in their own economies. In effect, this led to a fall in direct foreign investment. More so, the submissions received also suggest that the global financial crisis led to an increase in the level of non-performing loans and hindered DMBs from creating new credit. In summary, the opinion obtained from Nigerian banking regulators indicate that the global financial crisis had far reaching adverse effects on the Nigerian banking sector. To this end, the opinion of Nigerian regulators suggests that the global financial crisis affected the financial performance of Nigerian DMBs and the Nigerian banking sector in the whole.

The assertion from Nigerian regulatory authorities suggests that Nigerian DMBs were negatively affected by the episode of the global financial crisis. And to confirm the position taken by the regulatory authorities, submissions from DMBs were solicited. The fifteen senior bank managers interviewed also expressed the view that the banking sector was

unfavourably affected by the global financial crisis. However, their responses differed as to the level of affliction sustained. One bank manager in line with the general conception asserted that:

> *"It is true that commercial banks in Nigeria were affected by the global financial crisis and this bank, in particular, was gravely affected. The CBN carried out some assessments during the financial crisis and termed the profits declared by some banks as paper profits. The revenue of the bank plummeted, and non-performing loans became evident, and some staff were laid-off. The salaries of staff that were not laid-off were reduced because of the drop in revenue. Some of the bank's branches were also closed; especially branches that were not making enough income to cover their expenses."*

The opinion presented above is in tune with those offered by the CBN and NDIC. However, it pointed out further effects of the global downturn. Most importantly, the interviewee raised three salient issues. Bank branches were closed as a result of the drop in revenue; non-performing loans became evident, and bank staff were laid-off in addition to the pay reduction suffered by the retained staff. These indicate that the financial crisis had deeply rooted repercussions on the fortunes of some banks. For instance, the DMB above laid-off a number of its employees in a cost-saving strategy, however, it should be noted that even though the bank was not earning enough revenue, it still had to pay off the laid off employees. More so, the move to close non-profitable branches was also a cost saving initiative. However, businesses that should have been initiated in such branches have been lost because some bank branches are meant to serve the customers of other branches. In a nutshell, the submission suggested that the adverse effect of the financial crisis was not only felt by banking institutions in terms of dwindling revenue but also by households and the economy at large due to the laid-off staff that joined the large pool of job seekers in Nigeria. In addition, to the effects of the global financial crisis on Nigerian DMBs, the submission above also highlighted the importance of the survival of the Nigerian banking sector to the Nigerian economy. Hence as banking institutions become profitable and stable, individuals and the economy in the whole also prosper.

Moreover, even though all the fifteen interviewed bank executives agree that the global financial crisis adversely affected the Nigerian banking sector, the effect of the crisis on DMBs varied. The reactions received focused on the inability of DMBs to recover loan facilities emanating from some particular sectors during the financial crisis. As one interviewee put it:

> *"Facilities granted to players in the oil and gas sector were not serviced during the global financial crisis. The bank was highly geared to the oil and gas sector. To that effect, there was a build-up of non-performing loans in the bank during the period the global financial crisis lasted"*

The above sums the reaction of most DMBs in the Nigerian banking industry. The Nigerian economy is dependent on the oil and gas sector, and as such most DMBs granted more loans to players in that industry. As such a change in the dynamics of the price of oil products, no matter how small will impact on DMBs that lend predominately to major oil companies in Nigeria. Therefore, as the revenue of oil companies and major oil marketers dwindled in reaction to the global financial crisis, the level of non-performing loans increased due to missed loans repayments.

Similarly, DMBs that granted large loan facilities to businesses in the oil and gas industry were not the ones affected by the global financial crisis. One interviewee reported that:

> *"The bank was particularly geared to the real estate sector. Most customers that were granted facilities to build properties during the periods leading to the global financial crisis were unable to make regular payments in line with agreed terms."*

On the basis of the evidence from the above two responses, it can be deduced that loan repayments during the global financial crisis were a problem to Nigerian DMBs. The responses also reveal that the non-repayment of loan facilities during the global financial crisis emanated from large corporations.

Conversely, it seems the level of impact of the global financial crisis on individual DMBs depended on the type of operations and businesses DMBs embark on. However, the interwoven nature of the financial system spells that all DMBs in Nigeria were adversely affected by the global financial crisis. Nonetheless, the banking business culture and operations of some DMBs shielded them from the adverse effects of the global financial crisis. A senior manager from one of those banks revealed that:

> *"The bank was not gravely affected by the global financial crisis because of the type of business the bank engages in. The bank has been and is into retail banking and most of its customers are individuals and small business owners. The makeup of the customer base of the bank protected it during the global financial crisis."*

The submission revealed that DMBs that stayed true to their banking business culture and continued to cater for the needs of small customers and small business owners did not suffer the adverse impact of the global financial crisis. The small customers and small business owners most probably did not have any business dealings with foreign businesses or partners

and as such continued to meet agreed obligations to their banks. The submission above represents an interesting opinion to this study. Even though DMBs that engage in corporate banking usually rake in more revenues, they are more prone to global financial crises. And as such, the reactions obtained indicate that a fair mix of corporate and retail customers is a safer banking business model.

Still, on how the global financial crisis affected Nigerian DMBs, comments were sought from senior banks managers on whether derivative transactions affected Nigerian DMBs. The reaction of the effect of derivative transactions on the performance of Nigerian DMBs during the global financial crisis was sought because of the views expressed in literature. Various scholars suggest that complicated financial instruments like derivatives and securitization were responsible for the escalation of the global financial crisis. Consequently, the views of bank executives were sought to ascertain the level to which derivatives affected Nigerian DMBs during the global financial crisis. The responses received from all the fifteen interviewees showed that derivatives (swaps, futures, options and puts transactions) are not overtly popular in the Nigerian banking sector. Derivative transactions are only popular with large multinational corporations in the Nigerian economy. Thus, in providing a response to whether Nigerian DMBs were affected by derivative transactions during the financial crisis, one senior bank manager summarised the views of all the interviewed bank executives. He opined that:

> *"Unfortunately, the derivative market in Nigeria is not so developed, as commodities markets for derivative transactions are just being properly developed. Nigerian banks engage in derivative transactions but the only limiting factor is the volume of transactions. Only large corporations in the country, particularly those in the oil and gas business engage in such trades. Derivative transactions cannot be blamed for the problems that engulfed the Nigerian banking industry in 2008/2009."*

With the above view, it can be deduced that the absence of well-developed commodities and derivative market in Nigeria prevented the industry from further negative waves that emanated from the global financial crisis. This reaction also indicates that it is easier to manage a less developed banking system as complex banking transactions do not abound. Hence, this view supports the notion that "simple is bliss." Therefore, the submissions obtained agree that derivative transactions did not contribute to the adverse effect of the global financial crisis on Nigerian DMBs.

7.4 Challenges and Changes in the Regulation and Supervision of Deposit Money Banks

This section dwells on the review of recent challenges and changes effected by Nigerian deposit money banks in relation to 2005 banking reforms, 2009 banking reforms and the global financial crisis. The risk management guidelines initiated by regulators and the changes to risk management practices in a bid to ensure efficiency, performance, and stability in DMBs are reviewed. In addition, financial safety nets and in particular bank bailouts, initiatives that prompt financial stability, private monitoring initiatives, and international regulation are examined in this section.

7.4.1 Banking Reforms and Risk Management

This study investigates how banking reforms affected the performance of Nigerian DMBs. Previous submissions suggest that Nigerian DMBs were unable to manage various risk positions that consequently led to the erosion of shareholder funds, the sacking of eight bank management teams and the nationalization of three DMBs into bridge banks. Hence, this section assesses the areas where the banking reforms have improved risk management practices, where DMBs have failed in managing their risk positions and what they have done to protect shareholder funds and improve efficiency, performance, and stability.

Research Interview Questions	Interviewee Institution
How has the Central Bank of Nigeria and Nigerian Deposit Insurance Corporation improved risk management in commercial banks?	CBN/NDIC
How often do the CBN and NDIC engage in on-site bank examination of commercial banks?	CBN/NDIC

What documents does your bank make available to supervisors when they come for on-site inspections or examinations?	Deposit Money Banks (DMBs)

The Nigerian banking sector which was dominated by a large number of small DMBs has now metamorphosed into an industry of a small number of large DMBs. The banking reforms especially the 2005 banking consolidation programme changed the Nigerian banking landscape as DMBs have more equity and assets at their disposal. As a result, this section concentrates on analysing interview responses from regulatory authorities and deposit banks that also centre on the main types of banking risk (credit risk, liquidity risk, market risk and operational risk) that affect banks in Nigeria.

Beginning with how and if the CBN and NDIC have improved risk management in DMBs, questions were put forward in order to access the measures initiated by regulators charged with the responsibility of overseeing the activities of DMBs. The position of the CBN is that they have continued to promote adequate risk management practices in DMBs in Nigeria by issuing guidelines. The respondent from the CBN asserted that:

> *"In order to improve risk management in DMBs, the CBN issues guidelines to ensure that deposit money banks develop robust risk management systems and practices."*

The reaction offered by the CBN suggests that DMBs in Nigeria are allowed to develop their own individual risk management systems and practices in line with the guidelines provided by regulators. The consequence of this assertion is that DMBs must endeavour to have experienced risk managers and personnel as employees in order to ensure best practices are entrenched. Also, this implies that with banks developing individual risk management practices, supervision by regulatory authorities ought to be thorough and frequent.

In like manner, answers were also sought from the NDIC on how Nigerian banking reforms have instigated the development of adequate risk management practices. In furtherance of the assertion from the CBN, and in order to improve risk management in Nigerian DMBs, the interviewee from the NDIC affirmed that:

> *"A large number of staff from the NDIC and CBN have been trained on 'risk-based supervision', which the two regulatory agencies have been using as a guide to carry-out bank supervision. The CBN and NDIC have also instituted inter-bank risk management frameworks and have mandated banks to examine their internal risk management practices in line with*

The affirmation from the NDIC interviewee sheds light on the activities carried out by regulatory authorities to improve the management of risk in Nigerian DMBs. First, the introduction of risk-based supervision (RBS) is in line with the provisions of the Basel Core Principles on Supervision. The adoption of RBS is an indication that the supervision of banks is tailored to the needs of individual DMBs. This reveals that supervision in recent times has become more focused and detailed. More so, the interviewee opined that supervision prior to the 2009 banking reform was not carried out in line with tenets of RBS. Additionally, the above submission discloses that the CBN has developed a corporate governance framework. Various submissions and reports from both the CBN and NDIC throughout this research have indicated failures in corporate governance structures in the Nigerian banking sector. The development of the corporate governance framework shows that regulatory authorities are in tune with issues in the banking sector and are working on improving risk management practices. Most importantly, the interviewee from the NDIC acknowledged that employees of the regulatory agencies were being trained on RBS and the Basel Accords. Additionally, even though direct observation is not an adopted method of data collection in this study, the researcher found out through direct contact with staff of the CBN and NDIC during the fieldwork that staff of the CBN were being trained by experts on Basel II and Basel III.

In line with the above, and information from CBN and NDIC annual reports, this study inquired to find out the frequency of on-site bank examination of commercial banks. Bank supervision entails a review of financial documents/reports prepared by banks and on-site visits/examinations. More so, supervision is an avenue for curtailing banking risk. Therefore, in order to find out how well regulatory authorities in Nigeria have facilitated the mitigation of risk in the banking industry, views from regulatory authorities were solicited.

The interviewee from the CBN opined that the number of on-site visits and examinations does not determine the effectiveness or manner of supervision. The CBN interviewee declared that:

> *"On-site bank examinations and stress tests are not conducted based on a defined timetable. Bank examinations and stress tests are determined by the composite risk rating of the banking sector."*

The opinion above implies that the perceived risk in the banking sector determines the type of action to be taken by regulators. Consequently, if DMBs abide by regulations set out by regulatory authorities, and are adequately managing their risk positions; bank examinations and stress tests will be spaced and far in-between.

The response from the NDIC is in line with the submission from the CBN. Thus in shedding more light on the supervisory activities of regulators and how they facilitate the mitigation of risk in banking institutions, the interviewee from the NDIC opined that:

> *"Supervision prior to the 2009 banking reform was independently carried out by the CBN and NDIC; though findings were eventually reconciled and discussed. Nowadays, the CBN and NDIC carry out supervision together. Bank examination is done in batches with either the CBN or NDIC leading the examination team. Bottom-line, banks are jointly examined by the CBN and NDIC under the Risk-Based Supervisory (RBS) framework."*

The above disclosure informs that there was previously inadequate collaboration between regulatory authorities. The lack of harmonization between regulators may have led to the inability to notice the decay that nearly crippled the banking sector in the post-2005 banking reforms era. The view above further shows that the adoption of RBS by the regulatory authorities was to fortify risk management practices and minimise risk in the banking sector. In addition, regulatory documents from the CBN and NDIC reveal that regulators embark on four types of bank examinations, namely: routine examinations, target examinations, special examinations, and special investigations. Therefore, in relation to the determined composite risk in the banking sector, regulators either embark on routine examinations, target examinations, special examinations, or special investigations.

In line with the role of supervision in reducing risk in Nigerian DMBs, and in order to supplement the above findings on what determines the amount of bank examinations and stress tests carried out. This study sought to find out the documents requested by regulators when they embark on bank examinations and stress tests. Responses put forward by senior bank managers are in line with the conclusions from regulators that composite risk ratings of banks determine the type of investigations and consequently, the type of documents to be requisitioned. The general opinion from the fifteen interviewees was that supervisors request for different documents depending on the reason or focus of the bank examination or inspection. Hence, the two most detailed responses are presented. A bank manager from one of the Tier I DMBs stated that:

> *"Supervisors, first of all, make sure the archive of the bank is properly maintained when they visit. They ensure all the records of the banks are well kept. They check account opening packages and documents that have to do with revenue collection and tax remittance. The supervisors check to see if the bank makes prompt and exact remittances. The supervisors also investigate whether KYC's are properly done. They check for compliance with statutory laws like the display of the last annual statement of account of the bank, and also the display of the pictures of the president of Nigeria and Governor of the state of which a bank branch is domiciled. Supervisors also check the credit reports of the bank. In summary, supervisors check all the books of the bank to make sure they are all properly maintained and the bank is operating in line with set guidelines."*

The reaction above validates the responses from the regulatory authorities. It confirms that supervisors engage in bank examinations, to ensure DMBs are operating in line with set guidelines and regulations.

Additionally, to complement the above submissions, another senior bank manager from a Tier II (medium sized) DMB affirmed that:

> *"Depending on the aim of examination or inspection, for instance, if it is risk-based, supervisors review the loan portfolio of the bank. The supervisors review the level of documentation required to grant a loan facility. They inspect general customer documentation and review KYC forms. Supervisors also review customer records to make sure the bank does not keep the funds of customers that are involved in terrorist activities or businesses that have been prohibited by the government. Bank inspectors check whether companies that have been granted loans have the necessary documentations and the Corporate Affairs Commission (CAC) has adequately registered them. The supervisors also check and match documents the bank has in its possession with those at the CBN and NDIC. They check all the bank's classes of deposits and how the bank is managing those deposits. Returns to the government which also include withholding tax and PAYE are verified by supervisors to ensure that the bank is abiding by statutory provisions. In a nutshell, supervisors review the entire books of the banks depending on the focus of the bank examination."*

The above further complements previous proclamations and reinforce the opinion that bank supervision in the Nigerian banking sector is detailed and focused. Most importantly, it can be observed from the last assertions on bank supervision that bank examinations are risk mitigation driven. The views from the DMBs stress the keeping of adequate and up to date records. They also highlight the importance of KYC especially due to the terrorist activities ravaging some parts of the country. Nonetheless, in a nutshell, the submissions all agree that bank regulators embark on on-site bank examinations and various target based supervisions.

Progressively, the opinions expressed show more inclination towards ensuring effective loan and credit management in Nigerian DMBs. Consequently, the next section dwells on the credit risk management issues and management practices.

7.4.2   Banking Regulation and Credit Management Practices

Various sections of this study have positioned the management of loans (credit) which led to high levels of non-performing as one of the central problems of bank regulation in the Nigerian banking sector.   More so, previous submissions suggested that borrowers or counterparties were unable to repay loans or make regular payments in accordance with agreed terms especially after the 2005 banking reforms and during the global financial crisis. On that account, this section dwells on the loan application process of DMBs and the initiatives employed to manage non-performing loans.

Research Interview Questions	Interviewee Institution
Can you explain your bank's loan approval process?	Deposit Money Banks (DMBs)
How do you treat non-performing loans in your bank?	Deposit Money Banks (DMBs)

7.4.2.1   Loan Application Process

In view of the established notion that loans and credits were unsystematically granted after the 2005 banking reforms in the Nigerian banking sector, this section seeks to find out the initiatives or practices embarked upon to reverse the trend of default loan repayments and the flouting of loan contracts.

Senior bank executives provided responses to the extent to which DMBs have modified loan application processes in order to militate against credit risk. The overall views expressed by the fifteen interviewed bank executives agree that the granting of loan facilities became centralized after the 2009 banking reforms. The powers of branch bank managers were reduced in order to ensure the elimination of bias in the loan approval process. On that

account, a few responses that summarize all the views of the bank executives are presented below.

The reactions obtained reveal that loans are initiated in bank branches and the approval process takes it through various bank officers and review committees before approval is granted for disbursement. The general view is that those saddled with the responsibility of reviewing and approving loan facilities are seasoned risk managers. One bank executive from a Tier I DMB opined that:

> *"The bank has a robust credit approval memorandum process. It works in such a way that no single officer has the absolute power to prepare, recommend and approve a loan facility. There are different officers at each level saddled with the responsibility of preparing, recommending, and approving loans. Still yet, there are loan approval limits based on the amounts involved."*

The assertion above reveals that the bank has a laid down procedure for which the bank must follow before a facility is approved. In consensus, all the interviewees revealed that DMBs all have defined loan approval frameworks which must be adhered to before any facility is granted. The regulatory authorities suggested in previous submissions that the high rate of non-performing loans was one of the reasons for the 2009 banking reforms. However, it should be acknowledged that some form of credit approval processes also existed during the periods most DMBs suffered from default repayments. Hence, the existence of a credit memorandum process is not enough to prevent the build-up of non-performing loans. Nonetheless, the initiative to increase the number of personnel in the approval and review process of loans will possibly lead to the granting of better loans with less probability of default. More so, the above view revealed that the officers responsible for approving loans have amount limits they can approve. Thus, not all officers in the approval chain can approve certain amounts. Another bank executive from a medium sized DMB (Tier II) in line with the limit attached to granting of loans stated that:

> *"There are different types of loan and customers make requests for various amounts. Based on the loan type and the amount involved, the bank's delegated lending authority reviews the application. At each level, based on the amount involved, there is someone who approves a loan application. The higher the amount involved, the higher the rank of the approving officer. When the requested amount is very large, the board and the credit approval committee decide. Bank branch managers do not have any approval limits, they only support and concur to a loan request. Loan approvals are done at the regional level, directorate level, credit committee level and board level. So the larger the amount requested, the higher the level of reviewers and approvers."*

The above account brings so much to light. For one, loan approval has been centralised to ensure more experienced bankers and personnel are involved in the loan approval process to eliminate the casual granting of loans. Secondly, the granting of loans at branch levels has been eliminated and first loan approval level is the regional level which is overseen by a regional head. Thirdly, board members are part of the loan approval team. This view highlights an improvement in private monitoring as bank boards are made up of both executive and non-executive members. In summary, this view reinforces the assertion that the loan approval process has been centralised at top management level. This implies that the likelihood of granting loans and facilities to undeserving applicants has diminished owing to the perceived properly structured loan applications review process.

Similarly, another bank executive from one of the Tier I DMBs opined that:

> *"Prior to 2009 banking reforms, and after the 2005 banking reforms, branch managers had the authority to grant a maximum of five N1m worth of loans to five different customers without bank management approval. While zonal heads had the authority to approve up to a maximum of twenty N1m worth of loans, and regional heads had the power to approve loans to the tune of N50m to several bank customers. The bank, however, changed this and moved all loan approvals to the credit committee stationed at the bank headquarters. The change was informed by the high level of related party transactions. The branch managers therefore only had the authority to initiate the loan process, while the zonal and regional heads either reject or concur before the loan application is passed to the credit committee at the head office."*

Just like the previous Tier II DMB, the reaction above suggests revisions to loan approval processes and credit risk mitigation due to the ill-judged manner in which branch managers granted loans and facilities to related parties. The consensus to the type of behaviour exhibited by branch managers agrees to the view that mismanagement contributed largely to the shrinking of shareholder funds both in Tier I and Tier 2 banks. However, the streamlining of loan approval processes to credit committees located at bank headquarters ensures that loan approvals are reviewed devoid of bias and by experienced credit officers. In sum, experiences, the global financial crisis and the 2009 banking reforms necessitated the re-engineering of loan approval processes and credit risk management practices in DMBs and in the Nigerian banking sector in the whole.

Moreover, in line with the view that bank branch managers do not approve loans and loan approval has been centralised. Another interviewee from one of the banks that received capital injections through the bailout out initiate of Nigerian regulators suggested that:

> *"Temporary overdrafts which were previously approved at branch level by bank branch managers were stopped after the 2009 banking reforms. All temporary overdrafts are now approved by regional managers. The haphazard temporary overdrafts granted to customers by branch managers were hurting the bank. The customers granted temporary overdrafts were closely related to branch managers and the rate of default contributed to the erosion of the shareholder capital."*

The opinion presented above showed that the granting of temporary overdrafts was streamlined due to the frequency with which bank branch managers granted overdrafts to personal friends and family members without due process. This development sought to ensure that temporary overdrafts are thoroughly reviewed and granted to deserving bank customers. In totality, the view above indicates that credit risk management was fortified after banks lost shareholder funds obtained during the 2005 banking reforms. More so, the submission also highlighted the position that mismanagement of shareholder funds led to the erosion of capital which necessitated the bailout of the bank by Nigerian regulators in 2009.

In like manner, another bank executive from one of the bailed-out banks suggested that:

> *"Before the changes to the loan application process after the 2009 banking reforms. Bank managers granted a lot of small loans to their cronies because they had the authority to grant loans and overdrafts to the tune of N1m. The bank management found this out and banned the practice."*

This reaction agrees with the previous submission that highlighted the mismanagement of loan approval processes by branch managers. And in line with the above, the bank found it necessary to review its loan approval process. Based on these submissions, it can be suggested that flouting of set down loan approval processes contributed to the erosion of shareholders' funds which led to the bailout of eight banks in 2009.

To further drill-down on the loan approval process and how credit risk is being managed in the initial process of receiving loan applications, the interview participants suggested that DMBs engage in some form of checks to determine the suitability of loan and facility applicants. The responses obtained from bank managers reveal that loan/credit officers use the common five Cs of credit (capacity, collateral, capital, character, and condition) in reviewing customer loan applications. But, the utilisation of the five Cs is a common practice in banks and its usage is well documented in credit risk management discussions and literature. As a result, this study will not dwell on the five Cs. Nonetheless, in reviewing loan applications, bank interviewees were excited about the impact of the credit bureau. The increasing level of non-performing loans in the Nigerian banking sector which was highlighted by the stress tests that heralded the 2009 banking reforms spurred the CBN to

mandate banks to resort to the database of the Credit Bureau before processing customer loan applications. The Credit Bureau database which can be accessed by Nigerian lenders contains information on creditors, granted loans and defaulting loans. In buttressing the impact of the Credit Bureau in ensuring banks grant safe loans, one bank manager suggested that:

> *"The credit bureau database has so far been of great help to banks because customer information requested and generated are very informative. The database provides the total exposure of a loan applicant and even the bank the customer is indebted to."*

Similarly, another bank manager reported that:

> *"The bank carries out checks on customers in the initial stage of the loan application process. Checks are done using the credit bureau database. The database provides information about the total exposure of customers and who the customers are exposed to. More so, some customers do not even know they owe any bank when they apply for loans, so the credit bureau database tends to bring to light customer's exposures and helps banks recover written-off loans."*

The submissions and inferences drawn from interviewees suggest that the rejuvenated Credit Bureau has assisted in uncovering perennial debtors and led to the granting of loans to deserving applicants who are not geared to other financial institutions. More so, the bank managers interviewed were of the view that the continuous use of the Credit Bureau has led to reductions in the number of loans approved. In essence, the reactions opine that the recourse to the credit bureau is a step in the right direction as it helps to eliminate undeserving applicants and reduces credit risk.

So far, the opinions expressed have indicated that the mismanagement of loan processing procedures contributed largely to the erosion of shareholder funds after the 2005 banking reforms and during the global financial crisis. However, the centralization of loan application processes and the credit bureau have suggested improvements in credit risk management practices.

7.4.2.2 Non-Performing Loans

Owing to the documented presence of high levels of non-performing loans in the Nigerian banking sector in the post-2005 banking reforms period, this section dwells on the initiatives taken to reduce levels of non-performing loans and how established non-performing loans are handled in literature.

An important aspect of treating non-performing loans rests on whether provisions are made for them in the case of a default. In a bid to militate against default and reduce the level of non-performing loans, the CBN has mandated that banks make provision for bad debt in case of default. The views obtained from all the fifteen interviewees credit Nigerian regulators as the main architects in providing guidelines to the treatment of non-performing loans. To that end, one bank manager declared that:

> *"Provision is made for a loan immediately it is approved and disbursed. In line with the prudential guidelines developed by the CBN, I% is provided for notwithstanding whether the loan performs or not."*

The view expressed above opines that the CBN ensures DMBs make provisions for all facilities granted. The rationale behind this is that every loan has the probability of defaulting. The provision for loans, which the CBN mandates banks to keep, is commendable due to cushioning effect it would have in the event of default. More so, a loan can be assessed today and judged perfect with no likelihood of default, however, a single government policy or terrorist act like the Boko Haram menace can change the dynamics of a previously reviewed loan facility. The above submission, in a nutshell, shows that regulators have a vital role to play in managing default risk, as the mandate to make a provision of 1% ensures that the management of approved loans starts immediately it is sanctioned to be disbursed.

Still on the management of default risk and disbursed loans, one of the interviewed bank managers summarised the views obtained. All the DMBs are regulated by the same regulators and guidelines. On that account, he asserted that:

> *"The CBN through its prudential guidelines requires banks to classify loans as doubtful debt if after a period of 90 days; no principal or interest is paid. And if after a period of 90 to 360 days no principal or interest is paid, a loan should be classified as a substandard debt. And after 360 days a loan facility should be written off as a bad debt. In addition, a provision should be made for all these classes of debt in the financial books of banks."*

Credit creation is one of the main roles of banks. The fact that a fraction of customers always default cannot be changed. The ability to continuously devise internal processes in line with prudential guidelines determines the level to which default risk is handled. Thus, the mandate to continuously make provisions at various periods motivates banking institutions to intermittently review loan portfolios. The submissions reviewed in this section have shown that regulators in the Nigerian banking sector have played their role in ensuring guidelines and directions are provided to assist banks to manage their risk positions.

In line with presentations on loan approval processes and provisions made to address non-performing loans and disbursed loans, information on the recovery process of non-performing loans was solicited from bank managers. The reactions obtained from all the interviewed bank managers reveal the same process of recovering non-performing loans. One of the interviewed bank managers asserted that:

> *"When a loan facility has not been serviced, the bank first of all finds out the reason why the loan is not performing. The bank secondly writes the borrower to notify him or her and advice the borrower to adjust the facility. The facility is then enhanced, restructured or renewed depending on the outcome of the notification. Finally, should all amicable resolution measures fail; the bank initiates recovery procedures by calling in the collateral or engaging debt recovery agents (DRAs)."*

This procedure is the same with all the DMBs interviewed, thus the single quotation. The submission above indicates that banks in Nigeria try to find out the reasons borrowers are unable to make payments in accordance with their contractual agreement. This process apart from serving as an appraisal also exposes loan officers to the customer's business which could help them in assessing other loan applications. Additionally, the reaction shows that loans can be restructured after reviewing the outcome of the notification given to the customer. Nonetheless, as loans can be restructured, banks may engage in restructuring loans in order to avoid making provisions for them as bad loans in their books. The use of debt recovery agents (DRA) is presented as the last option if all other efforts to recover bad loans fail. However, events in the banking sector do not seem to show that the DRAs are effective in recovering loans. The CBN in 2009 had to publish the list of chronic debtors in national dailies because they felt DMBs had exhausted all the avenues within their power to recover loans. Similarly, the CBN in 2015 again mandated Nigerian DMBs to publish the list of chronic debtors in order to elicit payment. This indicates that even though guidelines from regulators and internal processes as mentioned in this section are geared towards minimising default and credit risk, the steps taken so far are not adequate.

Nevertheless, reactions emanating from DMBs opine that they have made changes to their risk management processes to reduce or eliminate the build-up of non-performing loans. The general view as held by interviewed bank managers is that Nigerian DMBs are not advocates of selling collateral to recover loans, though the selling of collateral enables banks to recover non-performing loans. Two of the interviewees affirmed that:

> *"The bank is not in the business of selling or seizing properties. We try as much as possible to ensure that our customers do not default, though a fraction of customers always default.*

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And in the event that customers default, the legal department and control unit of the bank handles the recovery of debts."

"The hurdles involved in selling properties given as loan collateral make the process unattractive. The legal hurdles and the cultural sentiments attached to landed properties make it difficult to seize and sell collateral. However, the bank in most instances retains the possession of collateral without selling them till the borrower pays a substantial part of the borrowed amount."

In line with the previous reaction, DMBs try to ensure customers do not default on granted loans. And when they default, the legal department and control units fashion out modalities to ensure the recovery of loans. Even though DMBs are not normally inclined to sell off collateral to recover non-performing loans, the paramount interest is to ensure all avenues are exploited in order to protect customer funds.

To that end, the reactions obtained indicate that strides have been made towards improving credit/loan management practices in the Nigerian banking sector by both regulators and bank managements. To sum up, regulators have enhanced credit/loan management practices by rejuvenating the credit bureau and providing prudential guidelines to ensure DMBs make provision for 1% of all disbursed loans (whether performing or not). Nigerian regulators also enhanced credit/loan management practices by ensuring the appropriate classification of loans in banking books. On the other hand, Nigerian DMBs have fortified credit/loan management practices by making certain loans are approved by more experienced risk managers and dedicated loan approval committees. Credit/loan management practices have also been enhanced by moving up the approval of temporary overdrafts from bank branch managers to regional managers in some instances and centralizing loan approval processes. Conversely, even though evidence shows that credit/loan management practices have been fortified, the CBN had to mandate DMBs to publish the names of chronic debtors in national newspapers in 2009 and more recently in the second half of 2015 to elicit adherence to loan contractual agreements.

Additionally, in responding to questions that border on the build-up of non-performing loans in the Nigerian banking sector, three interviewees divulged perceived reasons for default loan/credit repayments. One bank manager asserted that:

"Interest rates in Nigerian banks are too high for customers. Most interest rates range between 17% - 23% and this has led to a decrease in the number of loan applications."

In like manner, another interviewee submitted that:

"The 17% - 23% interest rates attached to bank loans in Nigerian is the cause of default. The interest rate deters customers from paying back loans and advances within the stipulated contract period."

More so, one interviewee commented that:

"The high-interest rate scares genuine borrowers from approaching the bank for loans. And in most cases, only desperate customers make use of bank loans because of the high-interest rates and charges."

The submissions highlight an interesting dilemma to this study. The view that the high-interest rates ascribed to loan facilities have led to a decrease in the number of loan applications can have diverse effects on banks. A reduction in loan applications can translate to reductions in the amount of non-performing loans because customers who might have defaulted are being discouraged by the high-interest rates. However, credit creation is one of the functions of banks and it is a main source of income. Consequently, if the high-interest rates are actually discouraging customers from making loan applications, then DMBs in the Nigerian banking sector are failing in their role as financial intermediaries. Banks naturally obtain deposits (funds) from the surplus side of the economy and transfer to the deficit side of the economy in order to promote growth and development. To this end, the inability of banks to create credits will impact negatively on the Nigerian economy. Progressively, if the high-interest rate is a unified strategy to generate revenue, the reduction in loan applications may translate to reduced incomes. Additionally, the submissions blame the high-interest rate for the high level of loan repayment defaults. In sum, the high-interest rates attached to bank loans in the Nigerian banking sector seems unfavourable to Nigerian DMBs and the Nigerian economy in the whole. In conclusion, the section below will dwell on liquidity management in the Nigerian banking sector as this portion of the study centred on the management of loans/credits.

7.4.3 Banking Reforms and Liquidity Management Practices

Literature presented in this study revealed that liquidity was a problem during the global financial crisis as some DMBs were unable to meet customer demands. The 2005 banking reforms transformed the fortunes of the Nigerian banking sector as Nigerian DMBs had at their disposal excess liquidity from the recapitalization exercise. However, previous reactions highlighted the inability of Nigerian DMBs to manage the excess capital by granting sub-

standard loans which eroded shareholder funds. More so, the limited time span between the 2005 banking reforms and the 2009 banking reforms which were informed by the findings obtained from the 2008 banking stress-test exercise showed decreasing liquidity levels. Therefore, evidence shows that liquidity levels were not properly managed in the post-2005 banking reforms period as a host of DMBs engaged in the haphazard granting of loans which culminated into declining liquidity levels. To that end, the questions in the table below guide the discussion as this study seeks to understand the treatment and management of liquidity in the Nigerian banking sector.

Research Interview Questions	Interviewee Institution
How does your bank treat excess liquidity?	Deposit Money Banks (DMBs)
What do branches do to maintain liquidity levels and in the event they run out of physical cash, what is done to pay depositors?	Deposit Money Banks (DMBs)
Can you please explain the relationship of your bank with the CBN in terms of deposits and withdrawals?	Deposit Money Banks (DMBs)
How well has the CBN been playing the role of lender of last resort?	Deposit Money Banks/CBN

To find out if and how liquidity levels plummeted in the Nigerian banking sector after the recapitalization exercise of the 2005 banking reforms, it was pertinent to find out how DMBs handle and treated liquidity (excess liquidity). As regards the treatment of liquidity in Nigerian DMBs, the reactions received from most of the senior bank managers attest that liquidity as at the time of data collection was not an issue in the banking industry. Nonetheless, one interviewee from a medium sized (Tier II) DMB asserted that:

> *"Excess liquidity is deposited with the CBN. While excess cash in the bank's branches are moved to the bank's cash centres before being moved to the Central Bank as deposits."*

In furtherance of the above assertion, another bank manager from one of the bridge banks stated that:

> *"The bank manages liquidity by buying treasury bills and placing excess liquidity in inter-banks markets."*

The two reactions sum up the views from the fifteen interviewed bank managers. The submissions indicate that excess liquidity is moved to the account of DMBs with the Central bank. Additionally, the above submissions also indicate that apart from the utilization of bank funds for the creation of loans; Nigerian DMBs buy treasury bills and place excess liquidity in the interbank market. The buying of treasury bills and the placement of excess liquidity serve as a means of earning returns from excess liquidity.

In line with the above, this study sought to find out how liquidity is managed in bank branches and what DMBs do to pay depositors in the event they run out of physical cash during the course of the day. In unison with the above held position that liquidity is not an issue in the Nigerian banking sector, one of the interviewees asserted that:

> *"The CBN is always at hand to assist banks whenever the bank runs out of cash. However, this rarely happens in recent times as the cashless banking policy has reduced the demand for raw cash."*

Furthermore, all the bank managers interviewed were of the opinion that the introduction of the "cashless policy" has helped in the management of liquidity. One interviewee who summarised how liquidity is managed in the Nigerian banking industry asserted that:

> *"Liquidity levels are managed in the bank by complying with regulatory requirements of cash reserve ratio, liquidity ratio, maintaining vault limits, and recourse to the inter-bank market in the event of unplanned huge withdrawal requests. However, it is unlikely that the bank will not be able to meet its short-term obligation of paying depositors because the 'cashless policy' has reduced the need for cash transactions."*

Similarly, another bank manager commented that:

> *"The bank relies on regulatory guidelines from the CBN for the management of liquidity levels in the bank. The guidelines specify the cash reserve ratio and liquidity ratio for banks operating in the country."*

The reactions above showed that both regulators and DMBs play diverse roles in managing liquidity levels and liquidity risk. Some important issues were raised by the submissions. For example, they suggested that the CBN issues guidelines on cash reserve and liquidity ratios, which determine how much percentage of customer deposits DMBs, must keep with the CBN. In addition, the management of liquidity in the form of vault limits ensures DMBs do

not keep physical cash that is not covered by insurance. It was also suggested that liquidity has not been a problem in Nigerian DMBs as a result of the cashless policy championed by the CBN, as DMBs have at every turn been able to meet customer withdrawal demands.

Equally, in line with the view that regulators play a massive role in the management of liquidity in DMBs, bank managers were asked to comment on their interaction with the CBN in the management of liquidity (deposits and withdrawals). The responses obtained present a consensus perspective concerning the relationship between DMBs and the CBN as regards deposits and withdrawals (liquidity management). An avowal that summarized all the views of all the fifteen interviewees declared that:

> *"Banks have statutory deposits that they must maintain with the CBN. Banks must operate within the capital adequacy ratio, liquidity ratio, cash reserve ratio, and NPL ratio set by the CBN. These are avenues in which the banking sector and the CBN interact on an ongoing basis. Withdrawals are legitimate as long as each bank maintains the statutory ratios. The CBN also make use of banks to manage liquidity in the economy by mopping or releasing funds from or into the economy by increasing or decreasing these ratios from time to time. The CBN also sells treasury bills and bonds to banks and the general public as a liquidity management strategy."*

It is evident from the opinion above that the management of liquidity in the Nigerian banking sector by bank regulators is adequately pursued through various prudential guidelines and set ratios. Also, it can be deduced that cash reserve ratios and liquidity ratios are fine-tuned in accordance with liquidity management strategies. In brief, the response indicates that the CBN manages liquidity in the economy in general and in banks through various liquidity ratios and prudential guidelines.

Furthermore, as presented in literature, central banks are the go-to institution in the event that banks run out of liquidity and are unable to perform their intermediation roles. In this instance, this study sought to find out from Nigerian DMBs how well the CBN has been playing the role of lender of last resort. Based on the premise that most of the reactions obtained in previous sections indicate that the CBN has been adequately performing its role as the lender of last resort. The submissions below validate the central role played by Nigerian regulators in liquidity management. Some reactions from bank managers are thus presented below:

> *"The CBN is now alive to its responsibilities. I can authoritatively confirm that devoid of the timely intervention of the Central bank in 2009, a lot of customers would have lost their deposits and a number of banks would have gone under."*

An interesting deduction from the view above is that the CBN was previously not alive to its responsibilities of providing liquidity and protecting customer funds. However, as no bank has been allowed to fail since the 2005 banking consolidation reforms, the opinion that the CBN is adequately providing assistance and guidance to Nigerian banks can be upheld.

Still more, another senior bank manager went further by explaining how the CBN plays the role of lender of last resort and how it intervened in 2009 to save eight DMBs in the banking sector.

> *"In my opinion, the CBN has been playing the role of the lender of last resort well. First by providing the inter-bank window for banks in need to access short-term funds, and then by intervening to prevent eight banks which failed its distress test from going down. The intervention saved billions of depositor funds and jobs, in addition to saving the Nigerian economy from a major banking crisis."*

Similarly, another interviewee asserted that:

> *"I think the CBN has been doing well. This bank, in particular, has never required the injection of capital or liquidity from the CBN. Other Nigerian banks had issues in terms of their liquidity levels and had to be acquired by the so-called big Nigerian banks. The CBN monitors how banks operate and how often they make withdrawals from the inter-bank lending market. When a bank is always borrowing from other banks in the interbank lending market, the possibility exists that it has liquidity issues. This bank is a largely retail bank and hence it has not had liquidity issues as opposed to banks that rely on few big customers. In short, the bank does not suffer from low liquidity levels; instead, it normally has excess to invest in treasury bills."*

Several areas of interest have been stressed by the above assertions. Foremost, the views above validate the opinion that the CBN adequately performs its role as the lender of last resort. Additionally, the excess liquidity is invested in treasury bills as a liquidity management strategy. But most importantly, the recurrent demand of funds by DMBs from the inter-bank market to cover liquidity shortfalls is an indication that a banks' liquidity position is not in order and should be closely monitored. However, even though it is claimed that the CBN uses the withdrawal patterns of banks from the inter-bank market as an indication for dwindling liquidity, the downhill slide witnessed by some DMBs shows that either the CBN does not pay enough attention or the information from the inter-bank market reveals little information of no consequence.

Finally, in order to corroborate the opinions obtained from interviewees from DMBs, views from the CBN were sought. Hence, the respondent from the CBN asserted that:

> *"The central bank has always performed its function as the lender of last resort by providing necessary liquidity to needing banks. The central bank steps in whenever a DMB is in distress and the bank has always been alive to its responsibilities."*

Though the response obtained from the CBN was expected, the reaction depicts that both DMBs and regulators are in agreement that the CBN is adequately playing its role as the lender of last resort in the Nigerian banking sector.

7.5   Financial Safety Nets

Financial safety nets as offered in literature are strategies or measures adopted by bank regulators to eliminate the occurrence of bank failures and crisis in the banking sector. Financial safety nets are regulatory risk management methods spearheaded by bank regulators. Hence this study sought to ascertain how well Nigerian regulators have protected DMBs from distress and collapse. Therefore, the financial safety net approaches (bailouts and bridge banking mechanism) employed by Nigerian regulators are the focus of this section.

Nigerian regulatory authorities injected tier II capital in banks that were diagnosed to be in distress in 2009 and for the first time employed the bridge bank nationalization technique to further prevent some banks from becoming distressed. On that account, this section starts with the examination of the bailout strategy and then briefly evaluates the bridge banking mechanism.

7.5.1   Bank Bailouts and Bridge Banking

Research Interview Questions	Interviewee Institution
Some Nigerian deposit money banks were bailed out by the CBN. Why did the CBN not allow them to fail?	CBN/NDIC
What is the present situation of the bailed out deposit money banks?	CBN/NDIC
Was the bailout strategy adopted by Nigerian regulators necessary?	Deposit Money Banks (DMBs)

The bank examination/stress test jointly carried out by the CBN and NDIC in 2008 discovered that up to eight (8) DMBs were highly illiquid and unhealthy. The regulators in their bid to prevent the banks from collapse injected a total of N620 billion to shore up capital in the distressed banks. Though the injected capital was in the form of Tier II capital (seven-year convertible bonds), which the banks were expected to pay back in due course.

It is, therefore, pertinent to uncover the reason behind the injection of bailout funds and why the CBN did not allow the distressed banks to fail. As such, the views of regulators were sought to deduce the reason for the intervention. Starting with the comment from the CBN, the interviewed bank regulation staff of the CBN opined that:

> *"The CBN did not allow the banks to fail in order to protect depositor's funds and enhance confidence in the banking system, which is crucial to promoting a sound financial system."*

Equally, the interviewee from the NDIC stated that:

> *"The decision to bail out the troubled banks was the best thing to do. The decision to save the banks from collapse was based on the intention of the CBN to promote confidence in the banking industry and protect depositor's funds. Even though it was a decision of the management of the CBN to bailout the banks, the decision was a result of extensive research and analysis of stress tests results."*

It can be inferred from the responses offered above that the injection of funds was undertaken to prevent panic in the financial system and prevent the collapse of the distressed DMBs. The views from Nigerian regulators highlight the importance of maintaining and promoting financial stability. In addition, opinion from the interviewee from NDIC implied that the decision to bail out the distressed DMBs was the product of research and in-depth analysis of the result of the 2008 bank examinations/stress test. It can be deduced that the bailout of DMBs was timely and necessary.

Likewise, all bank managers interviewed agreed that the injection of capital into some banks by the regulators was a progressive move. Even though some of the bank managers indicated that their banks did not receive any bailouts because they were not troubled, they praised the timely intervention of the regulatory authorities. The bank managers working with banks that received capital injections were overtly satisfied with the intervention. They claimed that the timely intervention of the regulatory authorities not only saved the banks from collapse but also kept them in employment. Examples of submissions from bank managers are presented below. A bank manager from one of the bailed out DMBs commented that:

> *"The move by the CBN to bail out the banks was genius and timely. The intervention saved the entire Nigerian banking sector from collapse. Due to the intervention of the CBN, no depositor lost his or her funds."*

Equally, another bank manager from another bailed out DMB in consensus with the above submission asserted that:

> *"The bailout of some banks was necessary and this bank was a beneficiary. Apart from saving the bank from collapse, the bailout saved our jobs."*

Another interviewee from a DMB that was not bailed out commented that:

> *"Although the bank was not bailed out, the bailout strategy adopted by Nigerian regulators to bail out the eight troubled banks was crucial and should be commended. It also informed the banking public of the commitment of regulators towards safeguarding their deposits."*

Equally, another interviewee from a DMB that was also not bailed out reported that:

> *"The adoption of the bailout strategy was a good move because the number of distressed banks was too much to be ignored. In addition, one single bank failure would have likely led to bank runs in the banking sector."*

In view of the reactions obtained from regulators and bank managers, the bailout of the eight (8) DMBs by the CBN was important to the stability of the Nigerian banking system. It can be deduced that the capital injection (bailout) was beneficial to all stakeholders in the banking industry in the sense that:

- Bailed out DMBs remained in business and depositors continued to have access to their funds;
- Shareholder funds were protected and the banks were afforded the opportunity to raise more capital;
- Regulators were to be reimbursed from recapitalization proceeds (the bailout was more like a loan to unhealthy banks);
- Numerous jobs were saved.
- General confidence in the banking system was maintained.

Most interestingly, the bailout specified that banks were expected to pay back the injected capital. And this may reduce the problem of moral hazard, due to the mandate to pay back the injected capital. As already mentioned, the CEOs and management teams of the bailed out banks were relieved of their jobs due to mismanagement that led to the bailouts. The punitive action ascribed to the management teams of banks that received the bailed out funds could be introduced as a recommended practice.

Conversely, it can also be inferred that the inability of regulators to adequately manage risk in Nigerian DMBs led to the bailout of the eight DMBs.

Moreover, previous sections of this study have indicated that three (3) of the bailed-out DMBs were nationalized into bridge banks, while the others were allowed to continue operating. Though, some of them like Oceanic Bank and Intercontinental Bank merged with Ecobank International and Access Bank. In reaction to the condition of the bailed out banks, the interviewee from the CBN opined that:

> *"The bailed out banks are providing banking services to the public and are meeting all prudential requirements of the CBN."*

Still more, the interviewee from the NDIC presented a broader picture by asserting that:

> *"Three of the bailed out banks that were nationalized into bridge banks are about to be bought over by other banks. A look at their financial books indicates that they are doing well. However, the bailout of the banks led to the sacking and blacklisting of the CEOs and their management teams."*

The opinions conveyed above are in agreement with the assertions that the injection of capital was a success and the bailed out DMBs are healthy. In summary, it can be deduced from the submissions that the bailout exercise was timely and necessary, as it prevented the collapse of distressed DMBs. Though, this would be verified by the quantitative analysis of bank financial figures.

In furtherance of the opinion expressed by the interviewee from NDIC, the situation of the three bridge banks were sought. Starting with submissions from the website of the Asset Management Corporation of Nigeria which (AMCON) which was tasked with overseeing the management of the bridge banks, the following was uncovered. The ownership of Mainstreet Bank and Enterprise Bank were officially transferred to Skye Bank Plc and Heritage Bank Ltd by AMCON during a divestment ceremony by the Governor of CBN on 28 January, 2015. Submissions during the ceremony put forward that both DMBs have been restored to financial solvency. On that account, Mainstreet Bank had a profit before tax of N13bn at the end of December 2013, while Enterprise Bank posted a profit before tax of N3bn (AMCON, New Highlights January 28, 2015).

The handing over of Mainstreet Bank and Enterprise Bank indicate the success of the bridge banking mechanism. Additionally, the opinion expressed during the divestment ceremony also suggests that both DMBs reported profits at the end of December, 2013. Therefore, in

line with the objective of employing the bridge banking mechanism, Nigerian regulators prevented the collapse of distressed DMBs.

In conclusion, both the bailout strategy and bridge banking mechanism employed by Nigerian regulators were able to ensure no DMB collapsed after the 2005 banking reforms. The bridge banking mechanism seems more successful as its adoption led to the successful nursing of two out of the three bridge DMBs to health. Conversely, the bridge banking mechanism would probably not have been resorted to if the bailout strategy was a complete success. Therefore, the moral hazard problem which has always plagued the adoption of the bailout strategy came to light in the Nigerian banking sector as the risk adverse behaviour of bank executives was not curled by the injection of the bailout funds.

7.6 Further Regulatory Initiatives

In line with regulatory changes in reaction to the global financial crisis and the mandate of recent reforms in the Nigerian banking sector, several initiatives have been taken by both regulators and bank managements to improve the bank performance and promote financial stability.

With regards to the participation of shareholders and investors in the management and supervision of banking institutions, this study sought the opinion of bank managers. Investors and shareholders are usually the most affected when banks fail because depositors are normally not covered by financial safety nets as the focus is typically bank customers. It is, therefore, imperative that they immerse themselves in the regulation of banks to safeguard their investments. The general view obtained from senior bank managers is that shareholders predominately interact with banks at annual general meetings although non-executive board members are large shareholders elected at general meetings to protect the interest of all shareholders in the day-to-day management. Reactions from senior bank managers are therefore offered below:

> *"Shareholders contribute to the regulation of banks. Board members congregate when there are major decisions to be taken or serious issues to be deliberated upon. The bank's board is made up of executive directors and non-executive directors. The non-executive directors are basically shareholders with large chunks of shareholdings. Important issues and decisions are brought to the attention of the board for thorough deliberation. Other issues outside the*

purview of the directors are discussed at annual general meetings, where the agenda would have been set out and shareholders would have been invited to vote if required."

"Shareholders regulate the activities of the bank by approving or declining to ratify certain board resolutions at annual general meetings (AGMs). They also vote out errant board members as well as serve as whistleblowers to regulators should they notice activities inimical to the growth of the bank."

The above views agree that shareholders are involved in the management of banks and most importantly they are consulted when major decisions are to be made. One interesting view offered is that shareholders are expected to serve as whistleblowers to regulators should they notice activities that might hamper the growth of the bank. Therefore, even though shareholders have the power to regulate the activities of DMBs, the bone of contention is how well they have been using the power they have to ensure DMBs only engage in best practices. Evidence uncovered during the stress tests by regulators before the 2009 banking reforms is an indication that private monitoring by shareholders was not adequate as they did not report the mismanagement in the banking sector. In this regard, shareholders are as liable as bank executives for the mismanagement uncovered by regulators.

Along the same line, another bank manager offered a similar notion with a slight deviation that shareholders and investors do not directly contribute to bank regulation. The bank manager asserted that:

"Shareholders and investors do not directly contribute to the regulation and supervision of banks. However, they play a role in the appointment of the directors of banks, who in turn are saddled with the responsibility of policy formulation, business decisions and day-to-day running of the bank through the management team."

Even though the above view is a slight deviation from the two previous, they all indicate that shareholders partake in the management of banks. The overriding deduction from the statement is that shareholders contribute in one way or another in the regulation and supervision of banks.

Additionally, during the course of the interview sessions, a bank manager made an important contribution to the increased responsibilities of bank board members. The bank manager opined that:

"Due to the level of non-performing loans in the bank, the policy on loan approval was revised such that any loan in excess of N100 million had to be approved by members of the board of directors. It is the belief of the bank that this will also improve corporate governance."

The above is an indication that board members (both executive and non-executive) have a role to play in loan approvals. Also, a more rigorous and careful approach to the granting of large loans will ensure that less risky loans are approved. Most importantly, the submission is of the notion that corporate governance will be enhanced with the increased role of bank board members in the loan approval process.

In conclusion, shareholders have a crucial responsibility of ensuring the survival of DMBs. The large sums of shareholder funds in the banking sector should be a motivation for increased regulation and supervision of DMBs. Therefore, owing to the fact that they are the most affected in the event of bank failures, it is imperative that shareholders voted to serve on bank boards do not align with bank executives. More so, for the reason that no shareholder reported the mismanagement that plagued the banking sector after the 2005 banking reforms. Consequent on the above, it can be opined that inadequate supervisory practices in the pre-2009 banking reforms period contributed to the erosion of shareholders' funds that led to the bailout of eight DMBs. Nonetheless, the views emanating from DMBs suggest that the 2009 banking reforms and the new corporate governance guidelines have improved private monitoring practices and bank supervision in the Nigerian banking sector.

7.6.1 Financial Stability and Banking Sector Development

This section seeks to draw conclusions contingent on the general health and stability of the Nigerian banking industry. Cooperation between regulators and banks are also reviewed to ascertain collaborative efforts that aim to promote financial stability and bank performance.

Research Interview Questions	Interviewee Institution
Are there any regulatory committees or collaborations between the CBN and NDIC?	CBN/NDIC
Are Nigerian banks financially strong enough to compete internationally with other big global banks?	CBN/NDIC
Are Nigerian deposit money banks on the right path?	Deposit Money Banks (DMBs)

As already suggested, regulatory authorities in the Nigerian banking sector do not operate in isolation. Opinions obtained throughout this study have indicated that the two main regulatory authorities (CBN and NDIC) collaborate to ensure DMBs are adequately regulated and supervised. To add to the already established notion that Nigerian regulators work together. The NDIC interviewee opined that:

> "The CBN and NDIC collaborate both at management and examiners level. They share information and meet on a regular basis."

To advance the above view, the interviewee from the CBN asserted that:

> "The CBN and NDIC collaborate regularly. There is also a committee of financial service regulators called the Financial Services Regulation Coordinating Committee (FSRCC), which fosters collaborations between regulators in the financial services industry."

In addition to the Risk Based Supervision (RBS) which has been expressed throughout this study as the foremost collaboration between the CBN and NDIC, the above submissions indicate that they also collaborate at management level. More so, the FSRCC exist to promote information sharing and cooperation between regulators.

Moreover, expressed opinions by regulators and DMBs have indicated that the banking sector has gone through reforms and DMBs have fortified their internal risk management practices. To this end, the perception of regulators was sought to ascertain the status of Nigerian DMBs as compared to international banks. The interviewee from the NDIC suggested that:

> "Quite a few Nigerian banks are international banks. Some of them are traded on the London and South African stock exchanges and they have branches all over the continent of Africa. Although they are financially strong and still growing, no Nigerian DMB is recognised as a Global Systemically Important Bank (G-SIB). However, the likes of Zenith Bank, First Bank, and Guaranty Trust Bank are viewed as systemically important banks within Africa."

In line with the above, the interviewee from the CBN offered that:

> "Nigerian banks are strong enough to compete internationally. Some Nigerian banks are players in International markets and they have branches in other African countries and in Europe. Several Nigerian banks have also issued Eurobonds which were subscribed by both local and international investors."

In this instance, the reactions obtained indicate that though Nigeria DMBs are not Global Systemically Important Banks (G-SIB), they are considered as big banks within Africa largely because of their presence in several African countries. Interestingly, the opinion that several Nigerian DMBs issued Eurobonds that were subscribed by local and international investors is an indication that investors believe in the Nigerian banking sector.

More so, the two reforms x-rayed in this study were initiated to set Nigerian DMBs on the path of growth and stability, hence this inquiry. Different bank managers have put various views forward, and the general perception is that Nigerian DMBs are doing well financially and the banking sector is developing. Several submissions are presented thus:

> *"The Nigerian banking industry is heading in the right direction. The 2005 and 2009 banking reforms placed Nigerian banks in healthy positions to compete globally. Nigerian banks have also adopted the IFRS, so they can appeal to investors outside the shores of Nigeria. Subjecting banks to adopt the IFRS has exposed them to international markets and by extension strengthened them to compete globally."*

The above assertion indicates that in addition to the two banking reforms reviewed in this study, the IFRS adopted in 2010 for the presentation of financial statements of Nigerian DMBs has improved financial disclosure. The fact that Nigerian DMBs have adopted the IFRS shows that their financial statements can be compared against those of other international banks. On that account, it can be suggested that Nigerian DMBs are heading in the right direction.

Likewise, another bank manager commented on the developments being witnessed in the area of alternative delivery channels. He submitted that:

> *"The Nigerian banking industry is growing, particularly in the area of alternative delivery channels, which has been aided by the cashless policy initiated by the Central Bank. The use of ATMs and Internet banking which customers previously neglected and were sceptical of using have witnessed increased patronage. Nigerian banks now have lots of internet and mobile banking applications available to depositors and more people are opening accounts because of the ease of banking."*

This affirmation reveals that alternative delivery channels in the form of ATM transactions and internet banking are spearheading growth in the Nigerian banking industry. Most importantly, the view that more people are continuously embracing the use of alternative delivery channels for banking transactions is a positive sign. And in addition, the ease of banking has stimulated increased financial inclusion.

Conversely, even as Nigerian DMBs are opined to be on the rise and growth, it was also inferred that the KYC guidelines of the CBN were being circumvented in order to promote the opening of individual deposit accounts. While hailing the achievements of his bank, one bank manager asserted that:

> *"Apart from conventional banking, banks are creating outlets for people to open and operate accounts. For instance, the bank has various schemes were traders and women are afforded the opportunity to open and operate accounts with minimal or no major documentation."*

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The desire of Nigerian DMBs to promote financial inclusion is commendable. Nonetheless, the drive to gain more customers while circumventing laid down rules and regulations is not a step in the right direction. It is unfortunate that all Nigerians are not captured in one unique national database. Even so, banks should not open accounts that sidestep the KYC guidelines. Besides encouraging the circumventing of the KYC guidelines, allowing customers to open accounts with little or no major documentation may allow problems like fraud and terrorism flourish. Fraudsters and terrorists might be able to gain access to banking services if account opening documentations are not properly handled in line with KYC guidelines and procedures. And if unethical practices of this nature are not checked, the desired progress forged by the 2005 and 2009 banking reforms might be derailed.

7.7   Chapter Conclusion

This chapter examined various issues in the regulation and supervision of Nigerian DMBs with particular focus on the 2005 and 2009 banking reforms, and the global financial crisis. The submissions obtained throughout the chapter indicate that both reforms had positive effects on Nigerian DMBs and the banking sector as a whole, although the 2005 banking reforms was unable to shield DMBs from the adverse effects of the global financial crisis. The findings suggest that the global financial crisis to a large extent and the build-up of non-performing loans because of the reckless granting of undeserving loan facilities led to the bailout of eight DMBs in 2009 and the downgrading of a national DMB to a regional DMB in 2011. More so, even though the injection of bailout funds was able to ensure the continuous operation of the bailed-out DMBs, the adoption of the bridge banking mechanism suggest that capital injections (bailouts) do not guarantee improved efficiency and stability. Nonetheless, aside from ensuring the continuous operation of the eight bailed-out DMBs, the bailout strategy promoted confidence in the ability of Nigerian banking regulators. In like manner, the bridge banking mechanism also ensured no banking institution failed in the Nigerian banking sector after the 2005 banking reforms. Additionally, the study found that internal control practices have been improved through the centralization of loan approval processes, while the inclusion of board members in loan approval processes has also fortified private monitoring and supervision practices. To this end, even though the bailout strategy and the bridge banking mechanism had to be adopted, the fact that no Nigerian DMB

collapsed is commendable. Finally, the two banking reforms, regulatory initiatives and the financial safety nets techniques have been able to protect and safeguard the Nigerian banking sector even though the processes were not error free and without hitches.

Chapter Eight: Discussion and Findings

8.1   Introduction

The three previous chapters dwelled on the presentation of findings from each of the three analysis techniques employed to achieve the aims and objectives of this study. This chapter focuses on the discussion of the findings from the three adopted analysis techniques. Thus, the findings from the DEA window analysis, panel data regression analysis and content analysis are harmonised in this chapter. Most importantly, the findings of each method are discussed and where possible the results of one are employed to explain the other. The findings of this study are also examined against related findings from different studies to identify trends or discover new reactions.

8.2   Effects of Nigerian Banking Reforms

This section focuses on the discussion of the investigation results of regulatory changes brought about by the 2005 and 2009 Nigerian banking reforms. Recapitalisation was largely the standout element of both reforms. Therefore, the outcomes that highlight the effects of the reforms on the performance of the DMBs are discussed below.

8.2.1   Bank Recapitalisation

This study analysed the performance of Nigerian DMBs before, during, and after recapitalization to ascertain the level of effectiveness of banking reforms initiated recapitalizations.

In view of the capital increase, the DEA efficiency scores submit that bank performance and efficiency levels increased immediately capital was injected. This was noticed in the increase in the average efficiency scores of DMBs in 2005 and 2006. Therefore, capital increases lead to increase in efficiency and bank performance. These results confirm the findings of

Obafemi et al. (2013) who suggested that the performance and efficiency of Nigerian DMBs improved after 2005 banking reforms. Obafemi et al. (2013) also commented that the Nigerian banking sector was inefficient before the 2005 banking reforms. Though the average efficiency score of Nigerian DMBs did not significantly increase immediately after the 2005 banking reforms, the efficiency scores of most of the DMBs in the pre-2005 banking reforms period corroborate the findings of Obafemi et al. (2013). In like manner, the findings of this study are also consistent with that of Barros & Caporale (2012) who opined that the Nigerian banking sector benefited from the consolidation exercise of the 2005 banking reforms and it serves as a springboard for further growth.

However, the results also show that increases in regulatory capital do not guarantee sustained bank efficiency, performance and stability. As some DMBs did not attain 100% efficiency levels and some that did attain 100% efficiency dropped after two years. This position indicates that although the efficiency levels and performance of Nigerian DMBs reacted positively to the recapitalization exercise of the 2005 banking reforms, capital increases does not always translate into future bank efficiency, performance and stability. This assertion is in line with the study of Oladejo (2010) who opined that though there was an upsurge in the performance of Nigerian DMBs regarding increased profitability and liquidity, deep issues persisted in the banking sector which the consolidation and recapitalization exercise of the 2005 banking reforms did not eliminate. Additionally, capital (equity) is viewed as a shock absorber which protects banking institutions from externalities. The position of this study aligns with that of Lui (2013) which opines that higher capital is not a solution to stability. This view also mirrors the submission of Ezike & Oke (2013) who suggested bank regulators look beyond capital regulation as the sole determinant of bank performance and concentrate on efficient and effective risk management and supervision.

Also, this study found out that Tier I DMBs that recapitalised in line with the provisions of the 2009 banking reforms to continue operating outside the shores of Nigeria had the most presence on the efficiency frontier in the post-global financial crisis period. In line with the submissions of Obafemi et al. (2013), Nigerian DMBs reacted to the recapitalization mandate of the 2009 banking reforms. This outcome is contrary to the position held above because of the distress witnessed in some DMBs during the period the bank went through the global financial crisis. However, the efficiency levels of the eight bailed out DMBs in later years discussed in subsequent sections of this chapter confirm the assertion that capital injections (recapitalisation) does not guarantee sustained efficiency, performance, and stability.

8.2.2 Performance of Small and Medium Sized DMBs Vs Large DMBs

Regarding the performance of small and medium sized DMBs (Tier II) and large DMBs (Tier I) in the Nigerian banking sector, this study found varied performance and efficiency levels in different periods. The results of this study show that small and medium DMBs were more efficient in periods leading to the 2005 banking reforms.

The consolidation exercise of the 2005 banking reforms scaled up the size of all the DMBs in the Nigerian-banking sector. Nonetheless, the gap between large and small DMBs surfaced again in 2009 in line with the provisions of the 2009 banking reforms that mandated DMBs with international operations to have regulatory capital of N100bn. On that account, the results of this study indicate that Tier I DMBs had superior efficiency scores in the post-2009 banking reforms period in the Nigerian banking sector. This outcome is not consistent with the view expressed by Eriki & Osagie (2014) who asserted that small and medium sized Nigerian DMBs were more efficient when compared against large DMBs in 2009. The different submissions could be as a result of the difference in methodology. While Eriki & Osagie (2014) used the conventional DEA technique, this study employed the DEA window analysis. More so, different inputs and outputs were used. However, DEA window analysis measures the performance of a particular DMU in three windows, hence providing more robust results. Thus, the results of this study should be more accurate. Nonetheless, the use of other inputs and outputs variables are recommended for future studies to ascertain if similar results are obtained.

8.2.3 Performance of Foreign DMBs Vs Indigenous Nigerian DMBs

Regarding the performance of foreign DMBs in the Nigerian-banking sector, the study found out that foreign DMBs performed better than only the large Indigenous Nigerian DMBs in the periods before the 2005 banking reforms. Nonetheless, the results, in general, do not show any clear difference in the performance of foreign and domestic DMBs in the pre-2005 banking reforms period. Put differently, neither foreign nor domestic DMBs outperformed the other in periods before the 2005 banking reforms.

Progressively, domestic DMBs in general performed better than the foreign DMBs after the 2005 banking reforms. Although the results show that foreign DMBs constantly featured on the efficiency frontier in the years after the 2005 banking reforms but mostly before the global financial crisis. However, the limited number of foreign banks in the Nigerian banking sector after the consolidation exercise of the 2005 banking reforms leads to the conclusion that Domestic DMBs were more efficient. Therefore, this study is in line with earlier studies on the efficiency of foreign-owned banks by Miller & Parkhe (2002), which suggested that domestically owned banks performed better because of their knowledge of the financial terrain. Contrary to this position, Tankoano (2013) who also adopted a three-year DEA window technique submitted that foreign Nigerian DMBs outperformed Nigerian DMBs. Nevertheless, it is possible that the small number of DMBs used by Tankoano and the variables (two input and two output variables) are responsible for the dissimilarity in findings.

Additionally, the efficiency level of foreign DMBs plummeted in the period the Nigerian banking sector went through the global financial crisis. For instance, the performance of Citibank which has its headquarters in the U.S was always present on the efficiency frontier in the windows before the global financial crisis. Therefore, these results are not consistent with the findings of Berger et al. (2005) who suggest that foreign banks from developed countries who may have access to superior technologies, particularly information technologies for collecting and evaluating quantitative information perform better than domestic banks. In essence, the results of this study are in agreement with that of Miller & Parkhe (2002).

Furthermore, the performance of Citibank during the global financial crisis presents another dimension to the performance of foreign DMBs. This study therefore opines that foreign DMBs from countries where a financial crisis originates are more likely to suffer from the crisis. This is in tune with the interview submissions from regulators that are of the view that Nigerian DMBs were affected by the global financial crisis through reversal of capital inflows and through business associations with foreign DMBs.

8.2.4 Regulatory Reactions to the Global Financial Crisis

The responses obtained from bank executives, and regulators suggest that the 2009 banking reforms were a reaction to the global financial crisis. Sanusi (2010) who suggested that Nigerian regulators intervened through the 2009 banking reforms in order to address the negative effects of the global financial crisis on bank capitals also echoed this view. Additionally, Sanusi (2012) submitted that corporate governance principles were also introduced in reaction to the global financial crisis and the unethical behaviours of some bank executives. In essence, the 2009 banking reforms can be viewed as a reactionary approach to banking regulation.

In line with the above, the literature presented in this study highlighted initiatives adopted by both international and national regulatory agencies to curb the adverse effects of the global financial crisis and country-specific banking crisis. In the post-crisis period, the BIS reviewed and upgraded Basel II, resulting in Basel III, which focused on capital and liquidity rules. The IMF, on the other hand, concentrated on fostering international financial stability. For instance, the IMF took the lead in shaping the policy response to the Eurozone sovereign and banking debt crisis (Cabral, 2013). In like manner, the U.S enacted the Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010 to enhance financial stability and facilitate the resolution of too-big-to-fail financial institutions, with the intention of protecting taxpayers from financial losses (Kane, 2012).

The responses obtained from bank regulators and executives suggest that the capital increase of the 2005 banking reforms improved the capacity of DMBs to carry out banking activities like loan creation. This study also concluded that the inadequate loan granting process was responsible for the depletion of shareholder's funds and liquidity, which led to the near collapse of some DMBs in 2009. In line with the literature from the regulatory authorities who blamed bank executives for engaging in related lending and granting of inadequately assessed loan facilities, this study echoes the assertions made by Ugwuanyi (2015) and Sanusi (2010).

Although Ezeoha (2011) agreed that the bank executives engaged in imprudent lending following the availability of huge capital after the recapitalization exercise of the 2005 banking reforms, the view that unsecured credits aided DMBs mitigate the level of non-performing differs from the findings of this study. However, it is likely that the view

expressed by Ezeoha (2011) accounts for the aggregate increase in the efficiency scores (Table 5.1) of DMBs during the global financial crisis.

This study identified several regulatory improvements in reaction to the global financial crisis. With regards to banking supervision, Nigerian regulators adopted Risk-Based Supervision. Nigerian regulators adopted the principles of RBS as proposed by the Basel Committee on Supervision with the view of assessing the risk profile of banking institutions and giving priority to controlling the identified risks. RBS is a proactive form of regulation and the implication for its adoption is that regulators will pay ample attention to the issues that have the potential of derailing financial stability (Randle, 2009).

In like manner, the law establishing an asset management agency to handle non-performing loans which was one of the elements of the 2005 banking reforms was finally enacted in 2010. The establishment of an asset management agency was relegated to the background due to the attention accorded the consolidation and recapitalization exercise of the 2005 banking reforms. However, with the build-up of non-performing loans in the Nigerian banking sector following the global financial crisis, Nigerian regulators were forced to push forward the establishment of the asset management agency (AMCON).

Additionally, reactions indicate that the credit bureau was revamped and Nigerian DMBs have started reaping the benefits of its usage. The responses show from bank executives denote that credit assessment process have been simplified because the profile of all Nigerian DMBs debtors can be obtained from the database of the credit bureau. To that end, highly indebted customers are denied loans facilities.

Similarly, this study found that Nigerian DMBs initiated several changes to their credit risk management practices. The high rate of non-performing loans in the Nigerian banking sector necessitated this move. DMBs respondents uniformly suggested that loan approval processes were streamlined as branch managers are now exempted from granting all forms of loans. As such, regional bank managers are the first loan approval officers, while credit committees that involve executive and non-executive members are saddled with the task of reviewing and approving large loans.

In summary, external and internal regulation of Nigerian DMBs was carried out in reaction to the episode of the global financial crisis and the imprudent activities of bank executives.

8.3.   Financial Safety Nets

This study was designed to determine the extent to which financial safety net strategies adopted by Nigerian regulators mitigated against the occurrence of bank failures. Apart from the merger and acquisition strategy employed to consolidate Nigerian DMBs during the 2005 banking reforms, the bailout strategy and the bridge banking model are financial safety net strategies adopted to resolve troubled banking institutions within the period under review in this study.

8.3.1   Bank Bailouts

Findings from both the content analysis of interview responses and DEA window analysis indicated that no DMB failed in the Nigerian-banking sector after the 2005 banking reforms. However, Nigerian regulators relied on the bailout strategy to rescue eight DMBs in 2008. This study found that the bank bailout strategy was just a temporary fix as the efficiency levels of most of the rescued DMBs dwindled after two years of the capital injection. This leads to the conclusion that the bailout strategy did not solve the inherent problem that led to the erosion of shareholder funds and liquidity. To that end, bailout strategies are just temporary fixes and not permanent solutions to resolving distressed banks. More so, the bailout strategy did not dampen the risk-taking behaviour of the DMBs that received capital injections from Nigerian regulatory authorities.

As mentioned in the literature review section of this study, various studies argue for and against the bailout of troubled banks (Gorton & Huang, 2004; Smith, 2011; Poczter, 2012). And although the main argument against bank bailouts is the creation of moral hazard (Dam & Koetter, 2012; Dell'Aricca & Ratnovski 2012), this study found that the bailout strategy adopted by Nigerian regulators was able to prevent the collapse of at least eight DMBs. The collapse of eight banks in the Nigerian banking sector could have adversely impacted the Nigerian economy because of the small number of banking institutions in the financial system. On that account, the advantage of the bailout strategy played out in the Nigerian banking sector as the distressed banks continued to operate with improved efficiency levels for at least one year after the capital injection.

In line with the above, this study confirms the submissions of De Caux et al. (2016) that bailouts prevent the collapse of troubled banks in the short-term but do not guarantee long-term banking system efficiency and stability. Additionally, this study produced results which also corroborate the findings of Poczter (2012) that suggested the injection of capital saves banks from immediate collapse but creates long-term incentives to engage in further risk taking ventures.

8.3.2   Bridge Banking Mechanism

The results of this study also show that the bridge-banking mechanism was a better financial safety net strategy. The efficiency scores of the three bridge banks significantly improved after the model was adopted. To that end, the decision of Nigerian regulators to adopt the bridge-banking mechanism, which allows critical functions and viable operations of troubled banks to remain in effect until a permanent solution is found, and proved appropriate.

The bridge-banking mechanism is one of the resolution techniques recommended by the Basel Committee. Contrary to legal and economic closure of troubled banking institutions that a bank's licence is withdrawn and the legal entity ceases to exist or there is interruption or cessation of a bank's operations, which may likely lead to severe disruptions and probably losses for the bank's customers. The goal of resolution techniques is to ensure troubled or weak banks are resolved without severe systemic disruption and without exposing taxpayers to loss (BCBC, 2015). On that account, the findings of this study show that Nigerian regulators were able to resolve three troubled banks without distorting confidence in the Nigerian banking sector, which could spur bank runs and panic.

Furthermore, a bridge bank is designed to bridge the gap between the failure of a bank and time when the liquidator can gauge and offer the bank to a satisfactory third party (BCBC, 2015). In line with the BCBC recommendation, the submissions obtained informed this study that the bridge banks were ready to be taken over by other healthy banks in the Nigerian banking sector. Hence, the bridge-banking mechanism was not only able to prevent the failure of the three DMBs, but it ensured they became attractive to potential acquirers.

8.4 Effects of the Global Financial Crisis on the Performance of DMBs

As mentioned in the literature review section of this study, the global financial crisis started in the second half of 2007 and affected several economies and financial institutions. To that end, this study set out to assess the extent to which the global financial crisis affected the performance of DMBs, in Nigeria. Submissions from the different analysis techniques used suggest that Nigerian DMBs were affected by the global financial crisis in different ways. The submissions of the interview responses and the efficiency scores of the DEA window analysis seem to vary to some extent. The interview responses clearly provide evidence that the Nigerian banking sector was adversely affected by the global financial crisis, while the average efficiency scores of DMBs showed improvements during the global financial crisis. However, a review of the individual performance of DMBs shows classes of DMBs that were adversely affected by the global financial crisis. Hence, the efficiency scores of Tier II banks that were eventually bailed out and those of foreign DMBs during the global financial crisis corroborate the interview responses obtained from bank regulators and bank managements that the Nigerian banking sector was adversely affected by the global financial crisis.

Interview responses from both bank regulators and managements agreed that Nigerian DMBs were affected by the global financial crisis due to their relationship with foreign banks; trading with clients of foreign banks who had trading relationships with partners that were hit by the global financial crisis; trading with partners in countries that were affected by the crisis, and foreign investors that invested in the country. As a result, the global financial crisis led to reversal of capital inflows, decline in stock market capitalization, erosion of banks shareholder's funds, and increase in the level of non-performing loans. Additionally, the submissions opine that DMBs were, therefore, unable to create new credits because of the adverse effect of the global financial crisis. This view is supported by the bailout strategy initiated by the Nigerian regulators to inject capital into eight DMBs in 2008.

Nonetheless, as previously indicated, the DEA window analysis showed an increase in the average efficiency score of the entire banking sector during the period it went through the global financial crisis. This finding is consistent with that of Sahin et al. (2016) who found that the efficiency of Turkish banks improved during the global financial crisis. In particular, to studies that adopted DEA window analysis to ascertain the performance of Nigerian DMBs, the findings of this study differs from the submission of Tankoano (2013) who

reported a decrease in the efficiency scores of Nigerian DMBs during the global financial crisis. However, the number of input and output variables used and the small number of DMBs examined by Tankoano is likely responsible for the dissimilar results. More so, the findings of this study and that of Sahin et al. (2016) differ from the findings of Moradi-Motlagh & Babacan (2015) which found that the global financial crisis adversely affected the efficiency levels of Australian banks. The empirical findings of Moradi-Motlagh & Babacan (2015) however support the qualitative analysis of submissions of this study, which opines that the global financial crisis adversely affected the Nigerian banking sector.

To clarify the disconnect between the qualitative and quantitative findings of this study, the efficiency scores of the DEA window analysis indicated that various classes of banks were affected by the global financial crisis in different ways. The efficiency scores of Tier I DMBs account for the improvement in the average efficiency score of the Nigerian banking sector during the global financial crisis. While the study found that the efficiency scores of Tier II DMBs and foreign DMBs were less efficient than they were in periods before the global financial crisis. Sahin et al. (2016) also found that foreign-owned banks most especially improved during the global financial which is contrary to the findings of this study which showed that efficiency scores of foreign banks in Nigeria plunged a bit during the global financial crisis. In line with the findings of Sahin et al. (2016), Gulati & Kumar (2016) also suggested that foreign banks in India were not adversely affected by the global financial crisis due to notion that they adopted best-practices and they were the technology leaders of the Indian banking industry.

To that end, this study contributes to literature in the sense that it empirically shows that financial crisis that occurs or originates in the country of foreign banks is likely to affect the foreign DMBs more than indigenous DMBs.

8.5   Predicting Distress

Pille & Paradi (2002) opined that the DEA was an adequate technique for detecting financial distress. To that end a variant of the DEA (i.e. DEA window analysis) was employed in this study to ascertain if the DEA could have predicted the financial distress in the Nigerian banking sector and how far back it can be used to predict banking distress. The results

obtained indicate that the DEA window analysis was not able to predict banking distress in the Nigerian banking sector. DEA window analysis was however able to show the efficiency level of Nigerian DMBs. The results showed DMBs to be efficient in a particular year and inefficient in the next year. Therefore, this study has been unable to demonstrate that DEA window analysis can be used to predict financial distress in the Nigerian-banking sector. However, the findings of this study remain valid as detecting the efficiency of DMBs is the central reason for the use of DEA window analysis. While the use of the DEA window analysis for predicting banking distress is a secondary objective.

On that account, the findings of this study is contrary to the previous studies of Avkiran & Lin (2012) who found that DEA could be used to identify distressed banks up to two years in advance. While the outcome of this study validates the suggestions of Kwon & Lee (2015) and Premachandra et al. (2011) that suggests DEA lacks predictive capacity and is relatively weak in predicting corporate failures. Also, the variant of the DEA model (window analysis) applied in the study is a poor banking distress prediction model in regards to the sample used. On that account, the predicative capacity of the DEA window analysis might be further ascertained by relying on a different set of input and output variables in future studies.

8.6 Determinants of Bank Efficiency, Performance and Financial Stability

8.6.1 Impact of Capital Adequacy

This section dwells on the discussion of the impact of capital adequacy on bank efficiency and performance. This study found that capital adequacy is positive and statistically significant to efficiency in the entire sample period. This same positive and significant effect of capital adequacy was also diagnosed for the pre-2005 banking reforms period, 2005 banking reforms & global financial crisis period, and 2009 banking reforms & post-global financial crisis period. This study produced results which corroborate the findings of Salim et al. (2016) and Sufian et al. (2016) who both reported that capital adequacy is positively reflected on bank efficiency. Therefore, the positive and significant relationship between capital adequacy and efficiency in the Nigerian banking sector provides support to the

argument that well-capitalised banks are less exposed to distress, as capital offers the necessary cushion to withstand shocks.

However, although Capital adequacy also has a positive relationship with efficiency in the 2005 banking reforms & global financial crisis period (2005 – 2008), significance level plummeted to 10% in the period the period regulatory capital was increased from N2bn to N25bn. The DEA efficiency scores denote that the efficiency levels of Nigerian DMBs increased within this period. Therefore, it is possible that the episode of the global financial crisis stimulated the fall in the influence of capital adequacy on efficiency. Sanusi (2012) opined that the intention of the recapitalisation exercise of the 2005 banking reforms was to increase the efficiency of Nigerian DMBs. To that end, the regression results are consistent with the interview reactions that suggested the 2005 recapitalisation exercise led to an increase in the efficiency level of Nigerian DMBs before the global financial crisis. More so, the drop in the significant effect of capital adequacy on efficiency agrees with the interview submissions that the global financial crisis impacted on the capital levels of DMBs.

Similarly, as reflected above, capital adequacy also had a positive and significant relationship with efficiency in the 2009 banking reforms & post-GFC period, though an improvement was noticed in the level of significance. The level of significance increased to 5% within this period. This improvement is likely due to the increase in capital levels for Nigerian DMBs with international operations from N25bn to N100bn. Moreover, it is possible that the increasing efficiency level of Nigerian DMBs is reflected in the slight positive movement in the influence of capital adequacy over efficiency. A further explanation can also be derived from views expressed by the interview respondents which suggest improvements in DMB efficiency in the post-global financial crisis in reaction to the 2009 banking reforms.

Regarding the impact of capital adequacy on bank performance, this study found insignificant relationships between capital adequacy and bank performance in all the periods examined. Even though the relationship was positive in the whole period, pre-2005 banking reforms period, and the 2005 banking reforms & global financial crisis period and negative in the 2009 reforms & post GFC (2009 – 2013), capital adequacy was not a determinant of bank performance. These submissions are contrary to the findings of Petria et al. (2015) and Naceur & Kandil (2009) who found positive and statistically significant impact of capital adequacy on bank performance. This result presents an interesting dilemma because the capital base of all Nigerian DMBs was increased from N2bn to N25bn in 2005 and from

N25bn to N100bn in 2009 for Nigerian DMBs with international operations. Moreover, the increase in capital did not prevent Nigerian DMBs from suffering from the adverse effect of the global financial crisis. Nonetheless, the interview submissions and obtained DEA windows efficiency scores suggest that Nigerian DMBs improved after the 2005 capital increase. Therefore, it can be argued that the adverse effect of the global financial crisis would have been worse in the Nigerian banking sector if it was not recapitalized in 2005.

Similarly, capital was injected into eight DMBs in 2009 in line with the bailout strategy of Nigerian regulators. In like manner, it is expected that this would influence bank performance, alongside the 2009 banking reforms but the regression results indicated otherwise. To that end, this study opines that though recapitalization might cushion the adverse effects of financial crisis and prevent the collapse of banking institutions, it is not guaranteed to influence bank performance. Hence, this study agrees with Lui (2013) who opined that better quality of capital is the key to enhanced shock absorption.

8.6.2 Impact of Asset Quality

Asset quality is the proxy for impaired loans to gross loans adopted in this study. Owing to opinions like those offered by Kirkpatrick et al. (2008) that suggest inefficiency mainly emerges from bad loans, this study examined the effect of asset quality (impaired loans) on efficiency. The whole sampled period, 2005 banking reforms & GFC period and 2009 banking reforms & post GFC period show insignificant relationships between asset quality and efficiency in the Nigerian banking sector, thus suggesting that the level of impaired loans in the Nigerian banking sector within the period it went through the global financial crisis did not influence the efficiency level of Nigerian DMBs. These results contradict the interview responses and the views offered by regulatory agencies, which claimed that high levels of impaired loans contributed largely to the erosion of shareholder's funds that led to the bailout of eight DMBs in 2009 and the downgrading of Wema Bank from a national bank to a regional bank in 2011. Nevertheless, it could conceivably be hypothesised that the small number of DMBs in the Nigerian banking sector, and the increase in the size and capital base of all DMBs watered down the influence of impaired loans on efficiency.

Therefore, the above results are not consistent with the findings of Kirkpatrick et al. (2008) and Sufian (2011) who both found impaired loans to have negative and significant influence over efficiency. Nonetheless, not all the periods examined indicated insignificant results, as the association between asset quality and efficiency in the pre-2005 banking reforms period is shown to be negative and significant. In view of the hypothesis offered in the previous paragraph, it is, therefore, likely that the large number of DMBs and their small size, in addition to the low capital base of Nigerian DMBs before the 2005 banking reforms made them vulnerable to the adverse effect of impaired loans and in general credit risk.

Proceeding to discuss the effect of asset quality (impaired loans to gross loans) on bank performance, the reported findings suggest impaired loans has a negative and significant in the Nigerian banking sector in the whole and pre-2005 banking reforms period. The results of these periods are in accord with the studies of Ongore & Kusa (2013) and Petria et al. (2015) who also found asset quality to have a negative and statistically significant effect on bank performance. To that end, increases in the level of impaired loans in the Nigerian banking sector examined in the whole infers a plunge in the performance of Nigerian DMBs. Additionally, the above supports the reactions expressed by the interview respondents and regulatory assertions which held that the build-up of impaired loans in the Nigerian banking sector derailed bank performance.

In reverse to the results reported for the whole period and the pre-2005 banking reforms period, the impact of asset quality on bank performance was found to be also negative but insignificant in the 2005 banking reforms & GFC period and 2009 banking reforms & post-GFC period. Just as highlighted in the discussion of the effect of asset quality on efficiency during the period the Nigerian banking sector went through the 2005 and 2009 banking reforms, and the global financial crisis, asset quality also has an insignificant effect on bank performance in the same periods. Equally, these results also raise the possibility that the consolidation exercise of the 2005 banking reforms that reduced the number of DMBs to 25 with increased capital lessened the influence of impaired loans over banking performance.

Furthermore, this study also sought to evaluate the impact of asset quality on financial stability. The obtained results indicated a negative and insignificant relationship in the whole period and three sub-periods. The insignificant result is surprising given the build-up of impaired loans was highlighted as a major issue that degenerated to the bailout of eight DMBs in 2009. Moreover, these results are not consistent with the findings of Uhde &

Heimeshoff (2009) which reported an interesting positive impact of impaired loans on financial stability.

8.6.3 Impact of Management Quality

Clearly, efficient cost management is a prerequisite for improving the efficiency of any banking sector. This section centres on the discussion of the findings of the impact of management efficiency on bank efficiency, bank performance, and financial stability. Management efficiency is the adopted proxy for operating cost to income (cost to income ratio). The obtained negative and statistically significant impact on the quality of management on efficiency in the whole period, and the three sub-periods agrees with Sufian (2011) who also suggested cost has a negative and significant impact on efficiency. On the other hand, the outcome of this research is contrary to that of Das & Ghosh (2006) who found management quality to have consistently positive and significant impact on efficiency. On that account, this study is not in consonance with the 'bad management hypotheses' of Berger & DeYoung (1997). Therefore, the results observed indicate good senior management practices, which influence input usage, day-to-day operations, management of loan portfolios, and the efficient monitoring and control of operating expenses. More so, the results are an indication that Nigerian DMBs have more to gain if they improve their managerial practices. The proceeding view is further supported by the interview submissions that opine that the imprudent lending behaviour of bank executives led to the erosion of shareholders' funds after the 2005 banking reforms, which forced regulators to bailout eight DMBs in 2009.

In respect to the impact of management quality on bank performance, the obtained results for the whole period of 2000 – 2013 and the three sub-periods indicate negative and highly significant relationships. The findings of this study are in line with Petria et al. (2015) and Rashid & Jabeen (2016) who diagnosed a negative and significant impact of management quality on bank performance. To that end, the results of this study suggest that bank performance increases in the Nigerian banking sector when cost are appropriately managed and decreases when cost spiral out of hand. In like manner, the interview responses also suggest that bank regulators replaced DMB executives who were unable to manage cost and improve the performance of their institutions. Thus, those who were efficient in the management of resources kept their jobs. Nonetheless, not all studies are in agreement with

the findings of this study. For instance, Heffernan & Fu (2010) and Bilal et al. (2013) observed positive relationships between management quality and performance.

Turning next to the effect of management quality on financial stability, the diagnosed results indicate a negative and significant relationship for all the periods examined. Hence, this study produced results that corroborate the findings of Uhde & Heimeshoff (2009) who ascertained management quality has a negative and significant effect on financial stability. In like manner, Bourkis & Nabi (2013) also found management quality to be negatively related to financial stability but insignificant for the whole period, pre-crisis (1993 – 2006), crisis period (2007 – 2008), and post-crisis period (2009).

Finally, the quality of management in the Nigerian banking sector was faulted by interview responses in this study. Therefore, corroborating the regression results, which suggest that when cost are managed properly, efficiency, performance, and financial stability increases. On that account, DMBs who were not cost effective and engaged in the granting of inadequately assessed and reviewed loan facilities had eroded shareholder's funds, which led to the sacking of the management teams of six DMBs. Additionally, regulatory reports and interview reactions, indicated that eight inefficiently managed DMBs were bailed out in 2009. On the other hand, DMBs that were efficiently managed had the opportunity to increase their capital to N100bn to operate outside the shores of Nigeria. As a result, the findings of the regression results obtained are in agreement with the interview and regulatory reports submissions.

8.6.4 Impact of Earnings

In view of the effect of earnings on efficiency, the results obtained shows that the earnings of Nigerian DMBs do not determine their efficiency in all the x-rayed periods. Therefore, earnings did not determine efficiency even when Nigerian DMBs were empowered during the 2005 and 2009 banking reforms. As such, earnings did not influence efficiency when Nigerian DMBs went through the global financial crisis. As a result, the findings of this study are not consistent with those of Sufian (2011) who found a positive and significant relationship between earnings and efficiency. More so, interview submissions provide possible explanations to the insignificant effect of NIM (earnings) on efficiency. The high

rate of non-performing loans and the investment of earnings in risky ventures are possible explanations.

Furthermore, in view of the findings of the impact of earning on the performance of Nigerian DMBs, this study found a positive and significant relationship in the whole period and pre-2005 banking reforms period. These results reflect those of Daly & Zhang (2014) and Khrawish (2011) who also found earnings (NIM) to be significant and positively related to bank performance (ROA). As a result, the performance of Nigerian DMBs increases as net interest margin increases. This result might be explained by the interview responses that highlighted that Nigerian DMBs in general charge high-interest rates on loans. The results of the whole period are in line with the interview submissions, which suggest Nigerian DMBs, engaged in the haphazard granting of loans after the 2005 banking reforms due to the availability of liquidity. On that account, performance increases when loans are repaid with interest in line with contractual agreements.

Conversely, the association between earnings and bank performance was found to be also positive but insignificant in the 2005 banking reforms & global financial crisis period and 2009 banking reforms & post-global financial crisis period. Put differently, the net interest margin of Nigerian DMBs had no effect in the determination of bank performance after the 2005 banking reforms. A possible explanation for this might be that reduced number of banking institutions and the increased capital base of DMBs rendered NIM inconsequential in the determination of bank performance.

With respect to the effect of earnings on financial stability, a positive and significant relationship was uncovered in the four examined periods. These results are consistent with the findings of Uhde & Heimeshoff (2009), who found positive and significant associations between NIM and Z-Score. In line with submissions, these results may be explained by interview responses that opined that Nigerian DMBs charge high-interest rates. It can also be hypothesised that earnings from the high-interest rates watered down the adverse effect of the global financial crisis when some debtors were unable to make repayments.

8.6.5 Impact of Liquidity

This section focuses on the impact of liquidity on bank efficiency, performance and financial stability. Starting with the impact of liquidity on bank efficiency, a negative and statistically significant relationship between liquidity and efficiency is diagnosed for the whole period (2000 – 2013) and the pre-2005 banking reforms period (2000 – 2004). These results are in line with the findings of Salim et al. (2016) who diagnosed liquidity to be negatively associated with efficiency. Just like in this study, Salim et al (2016) expected a positive association between liquidity and efficiency. The explanation to these results is that banking institutions engaged in activities that derailed efficiency anytime there was an increase in liquidity. In relation to reactions obtained from interview responses, bank executives engaged in the granting of haphazard loans facilities when liquidity levels increased. In contrary, Assaf et al. (2011) were able to find a positive and significant relationship between liquidity and efficiency.

However, not all the periods examined suggest liquidity significantly impact efficiency. Thus, the effect of efficiency on liquidity during the period the Nigerian-banking sector went through the 2005 banking reforms, 2009 banking reforms, and the global financial crisis was insignificant and negative. On that account, liquidity most likely ceased being a determinant of efficiency when all DMBs had excess liquidity at their disposal. The above explanation is consistent with the reactions offered by interview respondents that liquidity greatly increased in the Nigerian banking sector after the 2005 banking reforms. Having liquidity was therefore not unique as all DMBs had excess liquidity at their disposal. Hence, the reason liquidity ceased to determine efficiency within the period of 2005 – 2013. The downside of excess liquidity as suggested by interview respondents is that DMBs engaged in the granting of poorly assessed loans.

In relation to the effect of liquidity on bank performance, this study found that liquidity has a positive and significant effect on the performance of Nigerian DMBs in the whole period, pre-2005 banking reforms period, and the 2009 banking & post-global financial crisis period. However, the relationship between liquidity and performance was significant at 5% in the pre-2005 banking reforms and 10% significant in the 2009 banking reforms & post-global financial crisis period. These results are consistent with the findings of Ghosh (2015) and Flamini et al. (2009) who found liquid assets to be significant and positively related to bank

performance. These results, in essence, could imply that high liquidity levels may serve as a cushion for higher risks, which could translate to higher returns. Additionally, the regression results are consistent with the interview responses. The interview responses imply that the 2005 banking reforms period is the only period all Nigerian DMBs had similar levels of liquidity. To that end, disparity in liquidity levels existed in the pre-2005 banking reforms period and 2009 banking reforms & post-global financial crisis. Considering the disparity in liquidity levels of these periods, the regression results imply that an increase in the level of liquidity translate to an increase in performance.

In contrast, the findings of this study differ from the studies of Heffernan & Fu (2010) and Al-Jafari & Alchami (2014) who found liquidity to be negatively and slightly significantly related to bank performance. Hence, this study does not support the explanation attributed to the negative effect of liquidity, which opines that high levels of liquid assets would suggest lower lendable resources could dampen profitability.

Equally, the impact of liquidity on bank performance is found to be positive but insignificant in the 2005 banking reforms and the global financial crisis period. The findings of a few studies also show insignificant relationships between liquidity and performance. For instance, Almumani (2013) and Ayaydin & Karakaya (2014) found liquidity to have an insignificant effect on bank performance. Therefore, the period liquidity was not a determinant of performance in the Nigerian banking sector, could be attributed to the general increase in liquidity assets in all DMBs due to the consolidation exercise of the 2005 banking reforms. Put differently, the general increase in liquidity assets meant no DMB could refer to its high liquidity profile as a unique advantage.

Regarding the effect of liquidity on stability, positive and insignificant relationships were uncovered in the whole period, 2005 banking reforms & global financial crisis period, and 2009 banking reforms & post-global financial crisis period. In view of related findings, Chiaramonte et al. (2015) also found that liquidity had a positive and insignificant effect on financial stability in whole period and when the European banking system was going through the global financial crisis. In contrast, to the findings of this study, Marques et al. (2013) found a negative and significant relationship between liquidity and financial stability.

Conversely, the effect of liquidity on stability was found to be also positive but significant in the pre-2005 banking reforms period. This result may be explained by the fact that there were more DMBs in the Nigerian banking sector within this period and liquidity levels differed in

small and large DMBs. Hence, a possible explanation for this might be that DMBs with high levels of liquid assets were more likely to be stable with liquidity serving as a cushion.

8.6.6 Effects of Sensitivity to Risk

This section discusses the effects of the risk sensitivity of DMBs to efficiency, performance, and financial stability. As far as I know, efficiency and CAMELS studies make use of size to represent 'S'. To that end, there are no DEA-related studies to compare the findings of this study. Hence, the obtained results of the effects of sensitivity to risk to efficiency are restated with possible explanations in line with the DEA window efficiency scores presented in chapter 5.

This study shows that sensitivity to risk had a statistically significant and negative effect on efficiency in the whole study period and the pre-2005 banking reforms period. There were more DMBs in the Nigerian banking sector, which were relatively small. The large number of small-sized DMBs within this period, therefore, meant that they could easily fail. To that end, the Nigerian banking sector is stable when the vulnerability to risk reduces. More so, the negative and significant effect obtained in the whole period suggests in general that the Nigerian banking sector is more stable when it is less vulnerable to risk. This position is consistent with the study of Christopoulos et al. (2011) who opined that the Lehman Brothers bank had total securities to total assets ratio (close to 50%) before it failed.

On the other hand, the effect of sensitivity to risk on efficiency is also negative but insignificant in the 2005 banking reforms & global financial crisis period and 2009 banking reforms & post global financial crisis period. In line with the previous submission throughout this chapter, the increase in capital base of all Nigerian DMBs and the reduction in the number of DMBs operating in the Nigerian-banking sector rendered their vulnerability to market risk insignificant to determine efficiency.

In view of the effect of sensitivity to risk on bank performance in the Nigerian banking sector, the results obtained indicate a positive and insignificant association in the whole period and pre-2005 banking reforms period. The effect of sensitivity to market risk on bank performance is also insignificant but negative in the 2005 banking reforms & global financial crisis period.

This study, however, found that the effect of sensitivity to market risk on bank performance for the 2009 banking reforms & post-global financial crisis period is positive and significant. The effect of sensitivity to market on bank performance is, however, consistent with the findings of Mayes & Stremmel (2012) who reported a positive and significant relationship. This result was not expected, but the likely explanation is that DMBs who engaged in more risky ventures experienced improved their performances as the world recovered from the adverse effect of the global financial crisis.

Equally, the proxy adopted for sensitivity to risk by Chiaramonte et al. (2015), and Stiroh (2004) is non-interest income to net operating revenue. On that account, it is impossible to compare findings. To that end, the results obtained in this section can only be corroborated by the interview reactions from Nigerian DMBs and regulators. The findings of this study indicate that sensitivity to market risk has a positive and insignificant effect on stability in the whole period and 2009 banking reforms & post-global financial crisis period. Equally, although also insignificant, the relationship between sensitivity to market risk and financial stability is negative in the pre-2005 banking reforms period. Simply put, the sensitivity of Nigerian DMBs to risk was not a determinant of financial stability within the entire sampled period, the pre-2005 banking period, and when the 2009 banking reforms was initiated. Therefore, sensitivity to risk was not a determinant of stability in the period the Nigerian banking sector was recovering from the adverse effect of the global financial crisis.

Conversely, sensitivity to risk was diagnosed to have a positive and significant effect on financial stability in the 2005 banking reforms & global financial crisis period. In like manner, this submission is not consistent with the findings of Christopoulos et al. (2011) who opined that high ratio of total securities to total assets makes banking institutions vulnerable like in the case of Lehman Brothers.

8.6.7 Impact of Bank Size

The size of Nigerian DMBs increased significantly in reaction to the recapitalisation and consolidation exercise of the 2005 banking reforms. In like manner, the interview responses suggest that the banking model introduced by the 2009 banking reforms further led to the increase in the size of some banks. Therefore, the impact of size on efficiency, performance,

and financial stability is worth examining. However, literature provides ambiguous impact of size on efficiency, performance, and financial stability.

Regarding this study, bank size is found to have a positive and highly significant effect on efficiency in the Nigerian banking sector for the whole period, pre-2005 banking reforms period, and the 2005 banking reforms & global financial crisis period. The results above are consistent with the findings of Sufian (2011) and Berger Humphery (1997). In unison, these studies opine that the positive effect of size on efficiency indicates the presence of economies of scale. Hence suggesting larger DMBs took advantage of the scale economies through shared costs. Sanusi (2012) opined that the intention of the 2005 banking reforms was to promote efficiency and strengthen DMBs for growth. To that end, obtained interview responses opine that the size of banking institutions increased and the efficiency of DMBs also increased in reaction to the 2005 banking reforms. Therefore, the interview responses and the results of the DEA window analysis are in agreement with the regression results above.

On the other hand, the effect of bank size on efficiency was also diagnosed to be positive but insignificant in the 2009 banking reforms & post-global financial crisis period. Therefore, the explanation that the global financial crisis perhaps dampened the effect of size on efficiency as size ceased to determine efficiency in 2009 is possible.

In view of the effect of size on the performance of DMBs in Nigeria, this study found that size had a negative and significant effect on bank performance in the whole period and in the pre-2005 banking reforms period. The works of Lee & Hsieh, (2013), Macit (2012) and Pasiouras & Kosmidou (2007) that showed size to have negative and significant effects on performance support the above findings. These studies opine that size may negatively affect performance when diversification increases costs and some unprofitable branches continue to survive off profitable ones.

Furthermore, even though the relationship between size and bank performance in the 2005 banking reforms & GFC period and 2009 banking reforms & post-GFC period was also negative, this study also found that there was no statistically significant correlation. Heffernan & Fu (2008) and Tan & Floros (2013) also reported insignificant relationships between size and performance.

Contrary to the findings of this study, Ben Naceur & Goaied (2008), Menicucci & Paolucci (2016), Koutsomanoli-Filippaki et al. (2009), and Petria et al. (2015) established positive and significant relationships between size and bank performance. The explanation for the positive relationship between size and performance is associated with economies of scale and holds that banking institutions with vast amounts of assets normally control a larger portion of the banking market, thus improving profits through the allocation of fixed costs over a wider range of services (Menicucci & Paolucci, 2016; Koutsomanoli-Filippaki et al, 2009). This should put such privileged banking institutions in positions to negotiate lesser prices for inputs and acquire less expensive capital. More so, larger banks are more likely to benefit from higher product and loan diversification opportunities than smaller banks.

Turning to the impact of bank size on financial stability, this study found bank size to have a positive and 5% significant effect on stability in the whole period. The positive coefficient diagnosed is consistent with the pre-crisis findings of keffala (2015). The explanation for these results also rest on the economies of scale advantage attributed to larger banks.

Interestingly, all the three sub-periods examined in this study indicate a statistically significant and negative association between size and financial stability, although the significance level of each period differed. The pre-2005 banking reforms period and 2005 banking reforms & global financial crisis period showed 1% significant levels, while that of the 2009 banking reforms & post-GFC period stood at 10%. These results are consistent with Fu et al. (2014) Maudos & Fernandez de Guevara (2011) and Carretta et al. (2015) who all found negative associations between bank size and financial stability. Possible explanations for the negative effect of size on financial stability include (1) large banks are more difficult to monitor (2) as bank size increases, transparency may decrease as a result of expansion across several geographic markets and business lines and the use of sophisticated financial instruments like derivatives facilitate the establishment of complex corporate organizations. These improvements have the potential of reducing managerial efficiency, while internal control may increase operational risk, which could derail financial stability. More so, increasing banking institution complexity can render both market discipline and regulatory action ineffective (for instance, the adoption of bridge banking due to the failure of the bailout strategy) in preventing excessive risk exposure.

8.6.8 Impact of Gross Domestic Product (GDP) Growth

GDP captures upswings and downswings that manifest in business cycles. Therefore, GDP growth is expected to influence the efficiency, performance and stability of banking institutions. On that account, the effect of GDP on the efficiency of Nigerian DMBs was x-rayed in this study.

The results show that GDP has a positive and insignificant effect on efficiency for the whole period, pre-2005 banking reforms period, and the 2005 banking reforms & global financial crisis. While the effect of GDP on efficiency in the 2009 banking reforms & post global financial crisis period was also found to be insignificant but negative. On that premise, GDP had no influence over the determination of efficiency in the Nigerian banking sector. Contrary to the findings of this study, Alam (2012) found a positive relationship between GDP and efficiency. Increasing loan demands and decreasing loan default rates during periods of economic growth usually explain the positive coefficient of GDP on efficiency.

Additionally, this study assessed the impact of GDP on bank performance. The findings arrived at showed the effect of GDP on bank performance to be negative and significant in the whole period. The findings of Rashid & Jabeen (2016) and Safarli & Gumush (2012) are in favour of this study as they also found that GDP has a negative and significant relationship with bank performance. It is perceived that inadequate investment and limited production in any economy is mainly responsible for the negative effect of GDP on performance. A possible explanation for the negative effect of GDP on bank performance is that during periods of good macroeconomic conditions, businesses and corporate organisations may generate enough internal funds that they rely less on bank borrowing. On account of this, banking institutions would be unable to lend at favourable terms and conditions, which may negatively affect bank performance. Conversely, other studies that are inconsistent with the position that GDP has a negative and significant effect on bank performance include Bilal et al. (2013) Petria et al. (2015), and Heffernan & Fu (2008) who all found positive and statistically significant associations between GDP and performance.

On the other hand, the relationship between GDP and bank performance is found to be insignificant in all the three sub-periods. Although GDP has a negative effect on performance in the pre-2005 banking reforms period and 2009 banking reforms & post global financial

crisis period, while the effect of GDP on bank performance was found to be positive in the 2005 banking reforms & global financial crisis period.

This study also sought to find out the effects of GDP on financial stability. The results obtained indicate that GDP has a positive and statistically significant effect on stability in the whole period, the pre-2005 banking reforms period, and the 2009 banking reforms & post-global financial crisis period. These findings are consistent with that of Demirguc-Kunt & Huizinga (1999) who also found positive and significant relationships between GDP and financial stability. Another explanation for this is that demand for loans tends to be higher during expansionary periods, thus allowing banks to charge higher interests that are easily repaid by businesses and corporate organisations, and thus promotes financial stability. Simply put, positive relationships indicate that good economic conditions are key to financial stability.

Variance in the effect of GDP on stability is noticed in the 2005 banking reforms & post-global financial crisis period, as the results indicate a negative and insignificant effect of GDP on financial stability. In like manner, Bourkis & Nabi (2013) and Uhde & Heimeshoff (2009) indicate negative and insignificant relationships between GDP growth and financial stability.

8.7   Chapter Conclusion

The findings of this section show the value of relying on more than one method of assessing a phenomenon. The multifaceted approach employed provided robust conclusions that can be validated and relied upon. To that end, this study suggests that recapitalization or high levels of capital adequacy enhance efficiency, performance and financial stability. However, imprudent lending and high levels of impaired loans are capable of derailing the laudable regulatory initiatives. More so, quality of management determines the extent to which banking inputs are utilised as efficient management is diagnosed to be vital. On that account, high earnings accruing to banking institutions does not guarantee improved efficiency that will generate into financial stability. Though high liquidity levels serve as a cushion and promote financial stability, it affects efficiency adversely in instances when inadequately reviewed loans lead to a build-up of non-performing loans. Moreover, the efficiency of

DMBs is vulnerable to market risk, while performance is not always determined by the vulnerability of DMBs to risk, performance levels also improve in some instances. It can, therefore be assumed effective management of risk positions can translate into improved returns. More so, even though financial stability is vulnerable to risk, high capital and liquidity levels have the potential of ensuring stability. The general impact of size on banking institutions continues to be ambiguous. DMBs respond positively to size, while size has an inverse impact on bank performance and financial stability. Additionally, the economic condition of the Nigerian economy does not influence the efficiency of DMBs, while Nigerian DMBs tend to engage in activities that impact negatively on their performance. Nevertheless, DMBs are more stable during periods of economic bliss.

Given the reactions expressed throughout in this chapter, this study is of the opinion that though banking reforms were able to improve the general performance of Nigerian DMBs, it was not enough to prevent the erosion of shareholders' funds during the global financial crisis. In like manner, the bailout strategy prevented the collapse of some DMBs but was not successful in dampening the risk-taking behaviour of the bank managements. On that account, regulators adopted the bridge-banking mechanism that proved to be a better resolution technique as the troubled DMBs were nursed back to health and two out of three have been acquired. To that end, it can be concluded that the Nigerian banking sector is better off because of the reforms and initiatives adopted by Nigerian regulators.

Chapter Nine: Conclusion

9.1   Introduction

This closing chapter ends the study by providing an overall conclusion as to the results of the study. The chapter is broken down into sections that summarise the overall findings, the contribution of the study to theory and practice, the limitations of the study, areas for future research and policy recommendations to improve banking regulation and supervision.

9.2   Summary of Findings

A sound and stable banking sector is one of the basics of sustainable economic growth and development. In this regard and in a bid to ascertain how Nigerian banking reforms have influenced the performance of DMBs, this study qualitatively and quantitatively analysed the efficiency, performance, and stability of Nigerian DMBs over the period 2000 – 2013. Therefore, a summary of findings obtained from the three adopted analysis techniques that address the research questions are presented.

The findings of this study indicate that both the 2005 and 2009 banking reforms improved the Nigerian banking sector. Starting with the 2005 banking reforms, the recapitalization and consolidation exercise produced bigger DMBs with increased branch network and improved technology usage. The reactions obtained highlighted that there was increased liquidity in the Nigerian banking sector following the 2005 banking reforms, which translated to increased loan creation. Additionally, as depicted in Table 5.1, the aggregate efficiency of Nigerian DMBs improved after the 2005 banking reforms. Therefore, leading to the assertion that the 2005 banking reforms were a success because it was a proactive approach by Nigerian regulators to make Nigerian DMBs highly capitalised in order withstand economic shocks.

In spite of the success ascribed to the 2005 banking reforms, this study found that it was unable to shield some DMBs from the adverse effect of the global financial crisis. It was also diagnosed that credit risk and liquidity risk management were not stressed in the 2005 reforms as the activities of bank executives translated into high levels of non-performing

loans and eroded shareholders' funds. Hence, the inability of the 2005 banking reforms to mitigate against credit and liquidity risk and the episode of the global financial crisis led Nigerian regulators to embark on the 2009 banking reforms. Nonetheless, the level of capital erosion in the Nigerian banking sector because of the global financial crisis would probably have been worse if Nigerian DMBs were not consolidated and regulatory capital increased from N2bn to N25bn.

On that account, this study is of the view that the 2009 banking reforms is a reactionary approach to banking regulation. However, regulators were able to steady the Nigerian banking sector through the initiatives of the 2009 banking reforms. With increased regulatory capital large enough to withstand shocks, no DMBs failed after the 2005 banking reforms. To that end, the 2009 banking reforms further ensured no banking institution failed in the Nigerian banking sector. The downgrading of Wema Bank from a national bank to a regional development bank in line with the banking model put forward by the 2009 banking reforms was a way of preventing a bank failure. The 2009 banking reforms also revised the supervision strategy. Particularly, risk-based supervision was adopted as the preferred approach for monitoring and assessing risk in DMBs with the view of curbing the build-up of risk.

Furthermore, the results of this study indicate improvements in the aggregate efficiency of Nigerian DMBs in the post-global financial crisis period. The upward trend of efficiency depicted in Table 5.1 and the increased number of DMBs on the efficiency frontier in the post-global financial crisis period shows that the Nigerian banking sector was on the path of recovery engineered by the 2009 banking reforms.

This study also sought to ascertain the extent to which financial safety nets were able to mitigate the occurrence of bank failures and financial crisis in Nigeria. Apart from the consolidation exercise and the host of mergers and acquisitions that followed in the Nigerian banking sector. Nigerian regulators bailed out eight DMBs in 2009 and adopted the bridge-banking mechanism to resolve three troubled DMBs. The bailout strategy adopted by Nigerian regulators prevented the failure of eight DMBs. On that account, this study opines that the bailout strategy did not only prevent the collapse of eight DMBs but upheld confidence in the Nigerian banking sector and the ability of Nigerian regulators. Nevertheless, in line with the consensus that bailouts create moral hazard, this study found that the bank executives of the bailed-out DMBs continued to engage in imprudent activities.

The inability of the bailout strategy to improve the condition of the bailed out DMBs is confirmed by their low-efficiency scores in subsequent years (post bailout).

The adopted bridge banking mechanism was a more effective resolution technique. The study found that asides preventing the collapse of the three distressed DMBs, the bridge banking mechanism ensured they were nurtured back to health and made attractive for acquisition. On that account, two of the three bridge banks have been acquired, while negotiations are ongoing for the takeover of the last one. As such, the bridge banking mechanism has been successfully implemented in the Nigerian banking sector.

The Nigerian banking sector was affected by the episode of the global financial crisis in several ways. Qualitatively, reversal of capital inflows, erosion of shareholders' funds, inability to create new credit, and increase in the level of non-performing loans was highlighted as the avenue by which DMBs and the Nigerian banking sector were affected by the global financial crisis. Statistically, the DEA window efficiency scores of DMBs aggregately plummeted in the post-global financial crisis. However, downward movements in the efficiency scores of foreign DMBs and the eight DMBs that were bailed-out in 2009 was noticed during the global financial crisis. Therefore, the Nigerian banking sector was adversely affected by the episode of the global financial crisis.

Additionally, this study found that the primary business of DMBs determined the extent to which they were affected by the global financial crisis. DMBs that concentrated on retail banking were affected less than DMBs with huge exposures to corporate organisations that operated in the oil and gas sector.

More so, this study has shown that regulatory responses and internal control practices have been overhauled in reaction to the global financial crisis. The 2009 banking reforms, the improvement to the code of corporate governance for banks and other financial institutions, adoption of risk-based supervision, rejuvenation of the credit bureau, and the establishment of AMCON have been identified as regulatory responses to the global financial crisis. In like manner, credit risk management practices of Nigerian DMBs were fortified in reaction to losses that accrued due to imprudent practices that led to the erosion of shareholders' funds and liquidity levels. The loan approval processes of DMBs have been streamlined. For instance, branch managers use to approve overdrafts before the global financial crisis; however only regional heads have the power to approve such now. Equally, executive and

non-executive board members are also members of the credit review committee of DMBs, thus enhancing the private monitoring of DMBs.

This study has indicated the inadequacy of the DEA window analysis to predict banking distress. DEA window efficiency scores were able to show the efficiency level of banking institutions but were unable to predict future performance. Although some reviewed studies used DEA to predict financial distress, this study was unable to confirm such claims. To that end, this study is of the opinion that DEA and DEA window analysis is better suited for the evaluation of banking efficiency and performance.

The panel data regression analysis revealed that recapitalization or high levels of capital adequacy enhance efficiency, performance and financial stability. However, high levels of impaired loans are capable of derailing regulatory initiatives. Moreover, earnings accruing to banking institutions do not guarantee improved efficiency that will generate into financial stability. Liquidity serves as a cushion for the absorption of losses and promotes financial stability; it impacts efficiency adversely in instances when inadequately reviewed loans lead to a build-up of non-performing loans. Likewise, the efficiency of DMBs is vulnerable to market risk, while performance is not always determined by the vulnerability of DMBs to market risk. Effective management of risk positions was diagnosed to translate into improved returns. More so, financial stability was identified to be vulnerable to market risk, while high capital and liquidity levels have the potential of ensuring stability. The impact of size on banking institutions continues to be ambiguous. DMBs respond positively to size, while size has an inverse impact bank performance and financial stability. Economic conditions were found to have no impact on the efficiency of DMBs. Nevertheless, DMBs are more stable during periods of economic harmony.

The findings outlined above lead to the contributions this study has made to theory and practice.

9.3   Contributions of the Study

The main contributions of this study to literature and practice are as follows:

- This study appears to be the first attempt to thoroughly examine any banking sector using DEA window analysis, panel data regression, and content analysis of interview responses from both bank executives and regulators. The multifaceted approach for the examination of bank efficiency, performance, and financial stability provide robust conclusions that explained, confirmed and complemented the research findings. Therefore, the methods used can be applied to banking studies elsewhere in the world.

- In particular to the Nigerian banking sector, this study provided deeper insight into the activities of Nigerian regulators given the 2005 and 2009 banking reforms and the episode of the global financial crisis. To the best of my knowledge, this study is the first comprehensive assessment of the Nigerian banking sector to rely on three exclusive analysis techniques within the period of 2000 – 2013.

- This study contributes to the growing body of literature on the global financial crisis. Following the episode of the global financial crisis that started in the second half of 2007, various studies have been carried out to order to ascertain the extent to which financial systems have been affected with a view of preventing future occurrences. In that regard, this study evaluated the impact of the crisis on the Nigerian-banking sector and ascertained that Nigerian DMBs were adversely affected. The findings of the study showed that the global financial crisis affected countries in different ways. For instance, the global financial crisis started in the U.S through mortgaged backed securities, while it took root in Nigeria in the form of reversal of capital inflows and the build-up of non-performing loans. To that end, this study presents a dimension that has not been exploited.

- This study provided deeper insight into the workings of DMBs that are not highlighted in financial statements. The study identified risky behaviours carried out by DMBs that flout KYC guidelines. In a bid to increase financial inclusion and increase profits, DMBs engage in marketing promotions that allow individuals with little or no proper identification to open accounts. These activities are not captured by financial statements and reports. Therefore, underlining the importance of qualitative investigations.

- Choosing appropriate financial safety nets that do not encourage moral hazard has been a major issue. On that account, this study contributes to the literature on banking resolution in view that the Nigerian banking sector is amongst the few to have

adopted the bridge banking model after the global financial crisis to nurse distressed DMBs to health. The successful adoption of the bridge banking model in the Nigerian banking sector serves as a reference for regulators contending with troubled banks.

- In like manner, the study also adds to the debate on bailout strategies and moral hazard. The findings of this study confirm the view that bailouts encourage risk taking and do not deter bank executives from abandoning behaviours that plunge banks into distress.

- This study contributes to DEA studies in emerging economies. The DEA window analysis technique adopted in this study is a variant of the DEA frontier analysis, which as indicated in literature, has only been employed in a limited amount of studies in Nigeria and other African studies. On that account, its adoption adds to the growing body of DEA studies centred on the banking sector of emerging economies.

- Additionally, this study further confirms the suitability of the DEA window approach for the evaluation of bank efficiency and performance. For instance, the performance of troubled DMBs corroborated the stress test submission of Nigerian regulators that led to the bailout of eight DMBs in 2008.

- This study adds to the debate on financial distress prediction. Following the host of bankruptcies and corporate failures that plagued the banking sector of world economies and the desire to come up with models for predicting financial distress, various studies have evaluated different models. On that account, this study assessed the viability of employing the DEA window analysis model to predict financial distress and found it to be a weak predictive model.

This study has gone some way towards enhancing the understanding of recent happenings in the Nigerian-banking sector as it relied on interview responses that is scarcely used in assessing performance and stability of financial institutions. Consequently, the findings of this study are robust as information not highlighted in financial statements and regulatory documents are examined alongside financial data.

9.4   Directions for Further Studies

The empirical and theoretical issues that may be investigated for further dialogue and examination are stipulated as follows:

- It was ascertained during the study that literature on bridge banking adoption is limited. In that regard, the Nigerian case could serve as a reference. Therefore, the step-by-step process followed by Nigerian regulators and the appointed executive teams of the three bridge banks should be examined.

- The effects of foreign direct investment (FDI) reversals on the performance of DMBs should be investigated. The responses obtained in this study indicated that there were capital reversals in Nigerian DMBs due to the global financial crisis. As a result, studies should be directed at findings ways of preventing capital flight during periods of financial crisis.

- Reactions obtained suggest that the NDIC deposit insurance pay-out in the event of a bank failure is inadequate. Therefore, appropriate frameworks for ascertaining deposit insurance adequacy should be investigated.

- Regarding methodological extensions, comparisons could be undertaken with other frontier analysis techniques, such as stochastic frontier analysis (SFA). The SFA might identify a different set of efficient DMUs, which may or may not be consistent with the DEA window analysis results from this study. Therefore, a SFA study would confirm whether analytical methods other than DEA window analysis would offer additional value to the available information on the efficiency results that this study provides.

- More so, the inputs and outputs variables used in this study can be substituted with other variables like investments, personnel expenses, price of labour, price of capital. In the same vein, this study adopted the intermediation approach for variable selection, so the use of the production approach, or the value-added approach are also worth considering to ascertain if they will produce similar or more accurate results.

- Annual financial information was utilised to examine the efficiency of Nigerian DMBs, however quarterly data could be used to ascertain if the DEA window analysis can be relied upon to predict banking distress.

- In like manner, the CAMELS bank-specific proxies can be substituted with related proxies to find out if the determinants of efficiency, performance, and financial stability will remain the same.

9.5   Policy Recommendations

Following the findings of the investigations carried out, recommendations that should improve the regulation and supervision of banking institutions are presented thus:

- The results of this study especially the DEA window technique indicate that the performance of banks can change for better or worse within one year. To that end, this study recommends that the performance of banks be examined regularly and preferably on a quarterly basis to increase its predictability ability. Increasing surveillance will ensure imprudent and unethical behaviour that erodes liquidity and shareholders' funds are spotted early. Hence, ensuring recourse to financial safety nets and resolution technique are circumvented.

- The assessment of bank performance by regulators should not be based only on financial figures. In line with the strategy adopted in this study, the review of bank performance should be both qualitative and quantitative.

- Banking regulation should be proactive and not reactive. Proactive regulations are usually better thought out. This allows regulators ample time to assess and review frameworks and strategies. Put differently; supervisors should assess and act promptly to address unsafe and unsound banking practices that could derail financial stability.

- Regarding financial safety nets, even though the position of this study does not support the adoption of bailout strategies because it cannot be unshackled from the moral hazard it encourages. This study suggests that the adoption of the bailout strategy requires careful balancing. Whether it succeeds depends on the details and conditions in which it is employed. Conditions and penalties should be attached to prevent bank executives from engaging in additional risky activities. Banking institutions should also be directed to refund bailout funds when they become profitable.

- Regulation should encourage the diversification of portfolios. Banking institutions with interests in several sectors allocate risk in that the bottom line of the institution does not suffer when there is a crisis in one sector. For instance, Nigerian DMBs are highly geared to the oil and gas sector to the extent that they suffer huge losses anytime global oil prices fall.

DMBs should establish internal control frameworks that assist in fashioning adequate operational procedures, which control the build-up of risk. More so, the internal control processes should be in line with regulatory guidelines.

9.6   Research Limitations and Constraints

Some limitations and constraints identified during the study are presented below. Nonetheless, it is worth noting that these limitations and constraints have in no way diminished the findings of this study, but rather serve as lessons for future research.

- Obtaining access to interview respondents from Nigerian DMBs and regulatory agencies was a herculean task. Numerous visits, emails, and phone calls had to be made; this had an effect on the period intended for data collection.

- Primary data collection was limited in scope as responses were solicited from only DMBs that that survived the consolidation exercise of the 2005 banking reforms and the mergers and acquisitions that transpired after that. It is possible that reactions from employees and bank executives of DMBs that ceased to exist would have offered contrary submissions. However, this can only be ascertained through further studies, which will factor in the cost of locating former employees and executives.

- The generalisability of these results is subject to certain limitations because it is predominantly centred on the Nigerian banking sector. The Nigerian banking sector is regulated by guidelines prescribed by Nigerian regulators that have no jurisdiction outside the borders of Nigerian. On that account, the scope of analysis could not be extended to DMBs in other jurisdictions.

- Evaluation of research findings against related studies proved problematic because different variables are adopted as proxies for CAMELS, for instance, some studies employed Tier 1 regulatory capital ratio as the proxy for capital adequacy, while others use equity to total assets ratio.

- The adoption of three different analysis techniques was time-consuming as principles governing their adoption had to be learnt and perfected in other to arrive at robust conclusions.

9.7   Final Conclusion

This study was able to qualitatively and quantitatively examine the performance of the Nigerian-banking sector in relation to the 2005 and 2009 banking reforms and the global financial crisis. The study outlined the strategy that provided acceptable answers to the research questions. The content analysis of interview responses, DEA window analysis, and panel data regression facilitated the determination of the robust research findings. To that end, highlighting recommendations to improve banking regulation and supervision, and recommendations for further research concludes the study.

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Appendices

Appendix 1: Interview Questions for Regulators (CBN&NDIC)

- Where the objectives of the 2005 banking reforms achieved?
- If the 2005 banking reforms was a success, why did regulators embark on the 2009 banking reforms?
- What was the main rationale for the 2009 banking reforms?
- Where the objectives of the 2009 banking reforms achieved?
- How were Nigerian deposit money banks (DMBs) affected by the global financial crisis?
- How has the Central Bank of Nigeria and Nigerian Deposit Insurance Corporation improved risk management in commercial banks?
- How often do the CBN and NDIC engage in on-site bank examination of commercial banks?
- How well has the CBN been playing the role of lender of last resort?
- Some Nigerian deposit money banks were bailed out by the CBN. Why did the CBN not allow them to fail?
- What is the present situation of the bailed out deposit money banks?
- Was any compensation paid to depositors of the banks that failed after the 2005 banking consolidation reforms?
- Why are the deposits in Nigerian deposit money banks not explicitly (100%) covered by the Deposit Insurance Scheme?
- Who contributes to the deposit insurance fund and how much do they contribute?
- How do the CBN and NDIC promote confidence in Nigerian deposit money banks?
- Why is Nigeria not a member of the Bank of International Settlements (BIS)?
- Is the NDIC a member of the International Association of Deposit Insurers?
- Do the CBN and NDIC use guidelines from the Bank of International Settlements (BIS) and the International Association of Deposit Insurance (IADI) to design regulations and prudential guidelines for Nigerian deposit money banks?
- Are there any regulatory committees or collaborations between the CBN and NDIC?
- Are Nigerian banks financially strong enough to compete internationally with other big global banks?

Appendix 2: Interview Questions for Senior DMB Managers

- How successful was the 2005 banking consolidation reforms?
- What impact did the 2005 banking consolidation reforms have in your bank?
- What was the effect of the 2009 banking reforms on your bank?
- How was your bank affected by the global financial crisis that started in the second half of 2007?
- Do you think Nigerian Deposit Money Banks were affected by derivative transactions during the global financial crisis?
- What documents does your bank make available to supervisors when they come for on-site inspections or examinations?
- Can you explain your bank's loan approval process?
- How do you treat non-performing loans in your bank?
- How does your bank treat excess liquidity?
- What do branches do to maintain liquidity levels and in the event they run out of physical cash, what is done to pay depositors?
- Can you please explain the relationship of your bank with the CBN in terms of deposits and withdrawals?
- How well has the CBN been playing the role of lender of last resort?
- What are the responsibilities of internal auditors and compliance officers in the day-to-day running of the bank?
- How does the bank deal with staff fraud and fraud in general?
- Was the bailout strategy adopted by Nigerian regulators necessary?
- How well has the NDIC been managing deposit insurance contributions? And how does the bank interact with the NDIC?
- How do the CBN and NDIC promote confidence in Nigerian deposit money banks?
- What does your bank do to reassure customers that their deposits are safe?
- Do shareholders and investors contribute in any way in regulating the activities of Nigerian deposit money banks?
- Are Nigerian deposit money banks on the right path?

Appendix 3: Ethical Approval

University of
Salford
MANCHESTER

College of Arts & Social Sciences
Room 631 Maxwell Building
The Crescent
Salford, M5 4WT
Tel: 0161 295 5876

14 May 2014

Shitnaan Wapmuk
University of Salford

Dear Shitnaan

Re: **Ethical Approval Application – CASS130033**

I am pleased to inform you that based on the information provided, the Research Ethics Panel have no objections on ethical grounds to your project.

Yours sincerely

Deborah Woodman
On Behalf of CASS Research Ethics Panel

Appendix 4: Information Sheet

University of
Salford
MANCHESTER

To whom it may concern,

Research Title:

Banking Regulation and Supervision in Nigeria: An Analysis of the Effects of Banking Reforms on Bank Performance and Financial Stability

Researcher: Shitnaan Emmanuel Wapmuk

PhD Student

Salford Business School

University of Salford

Greater Manchester

United Kingdom

M5 4WT

Outline of Research: The purpose of this study is to assess the efficiency, performance, and stability of Nigerian deposit money banks in relation to the last two financial reforms initiated by Nigerian banking regulators. The study focuses on the extent to which Nigerian banking reforms have enhanced or impeded the performance and efficiency of deposit money banks. In broad terms, the study also aims to examine the strategies adopted by Nigerian bank regulators in resolving troubled banks and improving financial stability. On that account, this study seeks to achieve the following research objectives:

1. To examine the Nigerian banking sector prior and after the 2005 and 2009 banking reforms, in order to determine whether the reforms improved the banking sector.
2. To ascertain how statistical models can be used to predict bank distress in the Nigerian banking sector.

3. To investigate if the combination of statistical models will unearth dimensions neglected by individual models in the estimation of bank efficiency, performance and financial stability.
4. To establish if banking regulation and supervision stimulated stability in the Nigerian banking sector.
5. To determine the extent to which the global financial crisis derailed the performance of individual deposit money banks and the Nigerian banking sector in the whole.
6. To explore whether changes in banking regulation and supervision in reaction to the global financial crisis enhanced efficiency, performance and stability of the Nigerian banking sector.

This research sets out to obtain information from the Central Bank of Nigeria (CBN), Nigeria Deposit Insurance Corporation (NDIC), and all twenty-one (21) deposit money banks (DMBs) in Nigeria. Participants will include Bank regulation and supervision staff of the CBN and NDIC, and risk management/compliance officers of the commercial banks. The study will investigate the implementation of banking regulations and the last two banking reforms in Nigeria.

All collected data will be treated confidentially and any reference to any participants will be made anonymously. Information collected will be used for the production of a PhD thesis. Additionally, all data collected will be disposed on completion of the research in line with the University of Salford retention and disposal of data policy.

Kindly treat this letter as a formal application to interview some staff in your organisation.

Any queries relating to this research should be addressed to:

Dr Tony Syme
Salford Business School
University of Salford
Greater Manchester
M5 4WT
Email: R.A.Syme@salford.ac.uk
Tel: (+44) (0) 1612952534

Appendix 5: Invitation to Participate in Research

Research Title: Banking Regulation and Supervision in Nigeria: An Analysis of the Effects of Banking Reforms on Bank Performance and Financial Stability

Dear Sir/Madam,

I am Mr Shitnaan Emmanuel Wapmuk, a PhD student at the University of Salford in the Business School. You are invited to participate in the above-titled research. The purpose of this study is to assess the efficiency, performance, and stability of Nigerian deposit money banks with regards to the last two financial reforms initiated by Nigerian banking regulators. The study focuses on the extent to which Nigerian banking reforms have enhanced or impeded the performance and efficiency of deposit money banks. In broad terms, the study also aims to examine the strategies adopted by Nigerian bank regulators in resolving troubled banks and improving financial stability.

The study seeks to obtain the views of bank regulators and supervisors, and senior managers of deposit money banks in Nigeria to achieve the following research objectives:

1. To examine the Nigerian banking sector prior and after the 2005 and 2009 banking reforms, with the view of determining whether the reforms improved the banking sector.
2. To ascertain how statistical models can be used to predict bank distress in the Nigerian banking sector.
3. To investigate if the combination of statistical models will unearth dimensions neglected by individual models in the estimation of bank efficiency, performance and financial stability.
4. To establish if banking regulation and supervision stimulated stability in the Nigerian banking sector.
5. To determine the extent to which the global financial crisis derailed the performance of individual deposit money banks and the Nigerian banking sector in the whole.

6. To explore whether changes in banking regulation and supervision in reaction to the global financial crisis enhanced efficiency, performance and stability of the Nigerian banking sector.

Participation

Participants are under no obligation to take part in this research and are free to withdraw their consent at any time.

Duration of Response to Interviews

The interviews sessions will last for about 1 hour -1 hour 30 minutes.

Risk and Benefits

Participation in this study does not pose any risk to your safety or well-being. And there will be no compensation for participating in the research study. However, your participation in this study will assist the researcher in assessing the performance of Nigerian deposit banks concerning regulatory initiatives of Nigerian regulators.

Confidentiality

All information and data obtained during this research will be kept confidential and in a secure place. Information about participants will not be made public, and nobody outside the research team will have access to any information. And the final written thesis will ensure participants remain anonymous.

Results of the Study

The results obtained from the study will be used for the production of a PhD thesis and only related journal publications.

This letter seeks your permission to be involved in this research. Please indicate by signing the attached consent form.

If you have any concerns regarding this research, please contact:

Dr Tony Syme
Salford Business School
University of Salford
Greater Manchester
M5 4WT
Email: R.A.Syme@salford.ac.uk
Tel: (+44) (0) 1612952534

Thank you in advance for taking part in this research

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Appendix 6: Informed Consent Form

NAME:

POSITION:

ORGANISATION:

ADDRESS:

DATE:

Anonymity –   Requested   /   Not Requested

I, the above named participant, acknowledge that I have been recruited to participate in this research study conducted by Shitnaan Emmanuel Wapmuk from Salford University Business School, Greater Manchester, United Kingdom titled: **Banking Regulation and Supervision in Nigeria: An Analysis of the Effects of Banking Reforms on Bank Performance and Financial Stability.**

I have confirmed that the researcher has obtained the approval of my employees in order for me to participate in this research. Furthermore, I accept that there are no hazards or risks associated with this research.

I understand that my responses and inputs will be treated with confidentiality by the researcher.

I understand that my participation is entirely voluntary and that I may withdraw at any time and without needing to provide reasons for my withdrawal.

I also understand that I may provide the information anonymously and will indicate so above, in which case the researcher will allocate a random reference to me and only the researcher will know the name of the original source.

Finally, I give my full consent and understand that the information I am giving can be used as data for the purpose of the research conducted by the researcher.

Participant's Signature: ……………………………………………

Date: …………………………………………………………….

Appendix 7: 89 Legacy Nigerian Deposit Money Banks

Bank of the North Ltd	Habib Nigeria Bank Limited	EIB International Bank Plc	Wema Bank Plc
Chartered Bank Ltd	MBC International Bank Limited	First Atlantic Bank Limited	Zenith Bank Limited
Equity Bank of Nigeria Ltd	New Nigeria Bank Limited	First Interstate Bank (Nigeria.) Limited	Cooperative Bank
FBN (Merchant Bankers) Limited	Reliance Bank	Guaranty Trust Bank Plc	Prudent Bank
First Bank of Nigeria Plc	Standard Chartered Bank	Lion Bank of Nigeria Plc	SGBN
Intercontinental Bank Plc	Trust Bank of Africa Limited	New Universal Bank Limited	Intercity Bank Plc
IMB International Bank Plc	Assurance Bank	Access Bank	Liberty Bank Limited
New Africa Merchant Bank Limited	Cooperative Development Bank	Societe Bancaire (Nig.) Ltd	Afribank International Limited (Merchant Bankers)
Stanbic Bank Nigeria Limited	Devcom Bank Limited	Midas Bank	Lead Merchant Bank Limited
Platinum Bank	Equatorial Trust Bank Limited	Standard Trust Bank Limited	Regent Bank Plc
Triumph Bank Plc	United Bank for Africa Plc	Continental Trust Bank	ACB International Bank
Global Bank Plc	Centre Point Bank	Metropolitan Bank	Gulf Bank
Trade Bank	Ecobank Nigeria Plc	Bond Bank	Guardian Express Bank Plc
International Trust Bank Plc	Gateway Bank	All states Trust Bank Plc	Citizens International Bank Limited
First Interstate Bank	Oceanic Bank International (Nigeria) Limited	City Express Bank Limited	Afex Bank of Nigeria Plc
Fountain Trust Bank Plc	Afribank Nigeria Plc	Fidelity Bank Plc	Omega Bank
FSB International Bank Plc	Nigerian International Bank Limited	First City Monument Bank Limited	Fortune International Bank Ltd
Inland Bank (Nig) Plc	Eagle Bank Limited	NBM Bank Limited	Indo-Nigeria Bank Ltd
Investment Banking & Trust Company Limited (IBTC)	Hallmark Bank Plc	Nigerian-American Bank Limited	Magnum Trust Bank Limited
Manny Bank Nigeria Plc	National Bank of Nigeria Ltd	Union Bank of Nigeria Plc	Capital Bank International (CBI) Limited
NAL Bank Plc	Tropical Commercial Bank Plc	Universal Trust Bank of Nigeria Limited	
Pacific Merchant Bank Limited	Broad Bank	Diamond Bank Plc	
Trans International Bank Plc	Marina International Bank (Merchant Bankers)	African International Bank Ltd	

Appendix 8: 25 Deposit Money Banks after the 2005 Banking Reforms

Access Bank	Intercontinental Bank Plc	Union Bank of Nigeria Plc
Afribank Nigeria Plc	Citi Bank Nigeria Plc	Unity Bank Plc
Diamond Bank Plc	Oceanic Bank International Plc	Wema Bank Plc
EcoBank Nigeria Plc	Platinum Bank Plc	Zenith Bank Plc
Equitorial Trust Bank	Skye Bank Plc	
First City Monument Bank Plc	Spring Bank Plc	
Fidelity Bank Plc	Stanbic Bank Nigeria Ltd	
First of Nigeria Bank Plc	Standard Chartered Bank Plc	
Guaranty Trust Bank Plc	United Bank of Africa Plc	
IBTC-Chartered Bank Plc	Sterling Bank Plc	

Appendix 9: Deposit Money Bank with Interview Respondents

Access Bank	Guaranty Trust Bank Plc	Wema Bank Plc
Diamond Bank Plc	Skye Bank Plc	Zenith Bank Plc
First City Monument Bank Plc	United Bank of Africa Plc	Enterprise Bank
Fidelity Bank Plc	Sterling Bank Plc	Keystone Bank
First of Nigeria Bank Plc	Unity Bank Plc	Mainstreet Bank

Appendix 10: CCR Outcome

Windows	1	2	3	4	5	6	7	8	9	10	11	12
Years	2000 - 2002	2001 - 2003	2002 - 2004	2003 - 2005	2004 - 2006	2005 - 2007	2006 – 2008	2007 - 2009	2008 - 2010	2009 - 2011	2010 - 2012	2011 – 2013
No. of Banks	75	73	70	62	40	29	24	23	23	25	24	20
No. of DMUs	187	186	163	127	89	72	65	64	63	63	61	60
Efficient DMUs	17	8	7	10	8	6	5	13	8	9	8	16
Inefficient DMUs	170	178	156	117	81	66	60	51	55	54	53	44
Efficient DMUs	9.09%	4.3%	4.29%	7.87%	8.99%	8.33%	7.69%	20.31%	12.7%	14.29%	13.11%	26.67%
% of Inefficient DMUs	90.9%	95.7%	95.71%	92.13%	91.01%	91.67%	92.31%	79.68%	87.3%	85.71%	86.89%	73.33%
Average Efficiency Score	68.57%	58.6%	66.31%	69.77%	63.22%	67.56%	72.92%	82.56%	77.39%	73.84%	73.23%	81.9%

Appendix 11: DEA Window Analysis BCC & CCR Results

Access Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	79.34	62.23	64.04												68.54
Window 2		60	60.86	39.68											53.51
Window 3			66.66	51.16	62.36										60.06
Window 4				57.55	68.25	74.46									66.75
Window 5					65.42	69.94	73.97								76.16
Window 6						71.08	93.13	91.27							85.16
Window 7							86.18	88.68	70.98						81.95
Window 8								85.26	97.94	100					94.40
Window 9									95.9	100	92.87				96.26
Window 10										100	93.87	66.54			86.80
Window 11											100	77.36	66.37		81.24
Window 12												77.25	78.23	76.69	77.39
Annual Mean	79.34	61.12	63.85	49.46	65.34	71.82	84.42	88.4	88.27	100	95.58	73.72	72.3	76.69	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	79.34	62.29	64.34												68.66
Window 2		60	60.86	43.13											54.66
Window 3			66.66	51.16	65.49										61.10
Window 4				57.55	68.25	75.1									66.97
Window 5					65.42	72.09	100								79.17
Window 6						73.77	98.17	100							90.65
Window 7							86.18	96.31	99.76						94.08
Window 8								85.26	100	100					95.09
Window 9									99.61	100	93.55				97.72
Window 10										100	94.03	74.7			89.58
Window 11											100	85.27	70.08		85.12
Window 12												77.87	78.23	83.28	79.79
Annual Mean	79.34	61.15	63.95	50.61	66.39	73.65	94.78	93.86	99.79	100	95.86	79.28	74.16	83.28	

CitiBank Nigeria   CCR Efficiency Scores

Windows	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	62.23	64.04												75.42
Window 2		88.13	72.4	95.34											85.29
Window 3			83.53	100	86.44										89.99
Window 4				100	85.18	100									95.06
Window 5					79.84	100	100								93.28
Window 6						100	100	85.25							95.08
Window 7							100	87.19	94.2						93.80
Window 8								100	100	100					100
Window 9									95.77	87.18	84.64				89.20
Window 10										87.18	84.64	64.67			78.83
Window 11											84.64	64.88	83.75		77.76
Window 12												100	100	100	100
Annual Mean	100	75.18	73.32	98.45	83.82	100	100	90.81	96.66	91.45	84.64	76.52	91.88	100	

BCC Efficiency Scores

Windows	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	100	100												100
Window 2		100	95.25	100											98.25
Window 3			94.59	100	86.44										93.68
Window 4				100	85.18	100									95.06
Window 5					79.84	100	100								93.28
Window 6						100	100	89.17							96.39
Window 7							100	88	97.2						95.07
Window 8								100	100	100					100
Window 9									95.77	87.18	84.64				89.20
Window 10										87.18	84.64	64.67			78.83
Window 11											84.64	64.88	83.75		77.76
Window 12												100	100	100	100
Annual Mean	100	100	96.61	100	83.82	100	100	92.39	97.66	91.45	84.64	76.52	91.88	100	

Diamond Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	53.58	61.68	57.1												57.45
Window 2		49.58	49.56	76.17											58.44
Window 3			59.05	77.73	68.7										68.49
Window 4				77.08	67.79	85.11									76.66
Window 5					47.35	65.89	76.72								63.32
Window 6						65.89	76.72	58.71							67.11
Window 7							72.61	61.33	83.84						72.59
Window 8								68.46	92.34	86.22					82.34
Window 9									89.96	86.22	86.73				87.64
Window 10										86.39	88.13	86.52			87.01
Window 11											88.81	93.36	90.74		90.97
Window 12												100	96.15	83.49	93.21
Annual Mean	53.58	55.63	55.24	76.99	61.28	72.30	75.35	62.83	88.71	86.27	87.89	93.29	93.45	83.49	

BCC Efficiency Scores

Windows	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	55.58	62.76	68.87												62.40
Window 2		61.32	61.82	77.43											66.86
Window 3			65.63	78.32	75.31										73.09
Window 4				77.08	72.62	96.92									82.21
Window 5					55.91	80.25	88.67								74.94
Window 6						80.86	88.05	78.09							82.23
Window 7							82.63	71.89	98.46						84.33
Window 8								68.46	94.02	86.22					82.90
Window 9									93.32	86.22	86.73				88.76
Window 10										87.68	88.93	90.67			89.09
Window 11											93.44	98.45	94.67		95.52
Window 12												100	96.52	83.63	93.38
Annual Mean	55.58	62.04	65.44	77.61	67.94	86.01	85.93	72.81	95.27	86.71	89.7	96.37	95.60	83.63	

Ecobank Nigeria   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	50.51	60.99	54.91												55.47
Window 2		33.69	36.77	51.88											40.78
Window 3			41.71	58.76	55.04										51.84
Window 4				57.86	53.62	79.35									63.61
Window 5					42.69	69.47	73.97								62.04
Window 6						69.91	73.97	85.87							76.58
Window 7							74.89	85.17	61.4						73.82
Window 8								82.83	67.76	89.89					80.16
Window 9									65.02	90.43	82.04				79.16
Window 10										90.43	84.08	72.04			82.18
Window 11											87.95	80.65	61.93		76.84
Window 12												80.6	71.8	77.86	76.75
Annual Mean	50.51	47.34	44.46	56.17	50.45	72.91	74.28	84.62	64.73	90.25	84.69	77.76	66.87	77.86	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	50.71	63.29	57.7												57.23
Window 2		34.59	37.93	56.14											42.89
Window 3			41.71	58.76	58.12										52.86
Window 4				57.86	53.62	86.58									66.02
Window 5					42.69	82.42	89.71								71.61
Window 6						82.66	90.65	100							91.10
Window 7							87.01	97.32	70.94						85.09
Window 8								84.99	69.1	90.15					81.41
Window 9									65.02	90.43	82.04				79.16
Window 10										90.43	84.08	79.27			84.59
Window 11											87.95	88.09	70.14		82.06
Window 12												83.77	75.17	79.02	79.32
Annual Mean	50.71	48.94	45.78	57.59	51.48	83.89	89.12	94.10	68.35	90.34	84.69	83.71	72.66	79.02	

Enterprise Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10										0	0	18.85			18.85
Window 11											0	18.85	74.02		46.44
Window 12												30.76	100	68.51	66.42
Annual Mean										0	0	22.82	87.01	68.51	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10										0	0	18.85			18.85
Window 11											0	18.85	74.02		46.44
Window 12												30.76	100	68.51	66.42
Annual Mean												22.82	87.01	68.51	

Fidelity Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	58.59	39.81	50.26												49.55
Window 2		37.27	46.99	46.92											43.73
Window 3			53.68	53.18	57.97										54.94
Window 4				55.01	61.82	78.63									65.15
Window 5					50.55	62.88	63.35								58.93
Window 6						62.88	63.35	53.48							59.90
Window 7							65.57	62.62	100						76.06
Window 8								78.32	100	67.13					81.82
Window 9									100	67.13	73.37				80.17
Window 10										68.36	76.24	65.57			70.06
Window 11											78.81	69.71	71.05		73.19
Window 12												74.34	84.16	82.45	80.32
Annual Mean	58.59	38.54	50.31	51.70	56.78	68.13	64.09	64.81	100	67.54	76.14	69.87	77.61	82.45	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	58.59	39.81	50.26												49.55
Window 2		37.27	46.99	49.35											44.54
Window 3			53.68	53.18	59.87										55.58
Window 4				55.01	62.52	82.83									66.79
Window 5					50.55	62.88	63.35								58.93
Window 6						62.88	63.35	71.67							65.97
Window 7							65.57	67.57	100						77.71
Window 8								78.32	100	67.13					81.82
Window 9									100	67.13	73.37				80.17
Window 10										68.36	76.24	69.69			71.43
Window 11											78.81	72.01	88.52		79.78
Window 12												75.62	100	95.23	90.28
Annual Mean	58.59	38.54	50.31	52.51	57.65	69.53	64.09	72.52	100	67.54	76.14	72.44	94.26	95.23	

First Bank of Nigeria   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	70.78	69.92	100												80.23
Window 2		46.02	76.88	100											74.30
Window 3			83.18	100	79.2										87.46
Window 4				100	83.69	76.95									86.88
Window 5					78.63	70.71	100								83.11
Window 6						70.71	100	52.55							74.42
Window 7							100	52.54	69.68						74.07
Window 8								62.42	81.79	96.56					80.26
Window 9									80.3	91.99	83.13				85.14
Window 10										92.03	84.66	89.01			88.57
Window 11											92.21	94.78	90.59		92.53
Window 12												100	94.72	89.24	94.65
Annual Mean	70.78	57.97	86.69	100	80.51	72.79	100	55.84	77.26	93.53	86.67	94.60	92.66	89.24	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	80.72	78.12	100												86.28
Window 2		77.95	100	100											92.65
Window 3			100	100	100										100
Window 4				100	100	100									100
Window 5					100	100	100								100
Window 6						100	100	73.91							91.30
Window 7							100	69.3	100						89.77
Window 8								96.26	100	93.48					98.75
Window 9									100	100	100				100
Window 10										100	100	100			100
Window 11											100	100	100		100
Window 12												100	100	100	100
Annual Mean	80.72	78.04	100	100	100	100	100	79.82	100	97.83	100	100	100	100	

First City Monument Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	82.2	0	80.06												81.13
Window 2		0	74.45	66.34											70.40
Window 3			88.35	73.23	58.52										73.37
Window 4				67.93	57.73	63.59									63.08
Window 5					50.8	61.23	70.98								61
Window 6						61.45	70.99	75.1							69.18
Window 7							94.69	76.66	91.67						87.67
Window 8								82.06	100	93.48					91.85
Window 9									94.58	93.48	99.01				95.69
Window 10										93.81	100	84.46			92.76
Window 11											100	89.88	72.44		87.44
Window 12												100	80.65	83.59	88.08
Annual Mean	82.2	0	80.95	69.17	55.68	62.09	78.89	77.94	95.42	93.59	99.67	91.45	76.55	83.59	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	82.2	0	92.63												87.42
Window 2		0	88.18	70.01											79.1
Window 3			91.87	73.23	58.52										74.54
Window 4				67.93	57.73	63.59									63.08
Window 5					50.8	61.23	91.94								67.99
Window 6						61.45	80.18	91.92							77.85
Window 7							96.07	81.25	100						92.44
Window 8								82.06	100	93.48					91.85
Window 9									100	93.48	99.01				97.50
Window 10										93.81	100	84.46			92.76
Window 11											100	89.88	76.13		88.67
Window 12												100	80.65	83.83	88.16
Annual Mean	82.2	0	90.89	70.39	55.68	62.09	89.40	85.08	100	93.59	99.67	991.45	78.39	83.83	

Guaranty Trust Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	65.17	74.47	67.66												69.1
Window 2		56.97	55.25	62.14											58.12
Window 3			61.2	68.5	71.31										67
Window 4				65.32	75.92	85.77									75.67
Window 5					57.2	63.27	57.58								59.35
Window 6						63.27	57.58	52.61							57.82
Window 7							67.87	69.02	87.54						74.81
Window 8								71.94	100	100					90.65
Window 9									100	100	83.48				94.49
Window 10										100	85.91	85.43			90.45
Window 11											99.18	97.15	89.28		95.2
Window 12												100	100	100	100
Annual Mean	65.17	65.72	61.37	65.32	68.14	70.77	61.01	64.52	95.85	100	89.52	94.19	94.64	100	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	66.69	80.23	76.64												74.52
Window 2		73.74	75.78	90.82											80.11
Window 3			72.47	87.23	100										86.57
Window 4				74.05	89.39	100									87.81
Window 5					87.55	99.05	95.61								94.07
Window 6						94.89	77.7	83.26							85.28
Window 7							73.06	75.11	100						82.72
Window 8								74.74	100	100					91.58
Window 9									100	100	99.74				99.91
Window 10										100	95.24	100			98.41
Window 11											100	100	99.09		99.7
Window 12												100	100	100	100
Annual Mean	66.69	76.99	74.96	84.03	92.31	97.97	82.12	77.7	100	100	98.33	100	99.55	100	

Keystone Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10										0	0	29.96			29.96
Window 11											0	34.81	42.74		38.78
Window 12												36.59	64.57	58.13	53.1
Annual Mean												33.79	53.66	58.13	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10										0	0	29.96			29.96
Window 11											0	34.81	42.74		38.78
Window 12												36.59	64.83	58.13	53.18
Annual Mean												33.79	53.79	58.13	

Mainstreet Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10										0	0	37.16			37.16
Window 11											0	37.16	70.45		53.81
Window 12												68.09	100	100	89.36
Annual Mean												47.47	85.23	100	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10										0	0	37.16			37.16
Window 11											0	37.16	70.45		53.81
Window 12												68.09	100	100	89.36
Annual Mean												47.47	85.23	100	

Skye Bank (**Prudent Bank - 2000 – 2004**)   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	74.4	79.52												76.96
Window 2		56.59	51.15	53.83											53.86
Window 3			100	59.6	60.49										73.36
Window 4				59.45	58.77	54.92									57.71
Window 5					46.32	47.55	62.62								52.16
Window 6						47.55	62.62	43.92							51.36
Window 7							62.62	43.91	52.4						52.98
Window 8								61.71	76.69	81.1					73.17
Window 9									71.35	79.55	88.14				79.68
Window 10										81	88.89	89.88			86.59
Window 11											99.01	100	100		99.67
Window 12												100	100	85.43	95.14
Annual Mean		65.5	76.89	57.63	55.19	50.01	62.62	49.85	66.81	80.55	92.01	96.63	100	85.43	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	79.82	100												89.91
Window 2		70.15	100	55.48											75.21
Window 3			100	59.6	61.66										73.75
Window 4				59.45	58.77	54.92									57.71
Window 5					46.32	47.55	83.77								59.21
Window 6						47.55	83.77	61.53							64.28
Window 7							70.47	50.45	73.96						64.96
Window 8								61.71	80	81.1					74.27
Window 9									73.75	79.55	88.24				80.51
Window 10										81.13	89.06	94.75			88.31
Window 11											99.88	100	100		99.96
Window 12												100	100	85.43	95.14
Annual Mean		74.99	100	58.17	55.58	50.01	79.34	57.7	75.9	80.59	92.39	98.25	100	85.43	

Stanbic IBTC Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	79.06	100	100												93.02
Window 2		100	100	81.61											93.87
Window 3			100	99.32	80.74										93.35
Window 4				100	94.07	100									98.02
Window 5					100	100	100								100
Window 6						100	100	63.51							87.84
Window 7							100	99.35	81.08						93.48
Window 8								100	96.51	79.28					91.93
Window 9									90.69	82.22	96.12				89.68
Window 10										82.22	97.61	100			93.28
Window 11											99.04	100	76.16		91.73
Window 12												100	95.96	84.22	94.04
Annual Mean	79.06	100	100	93.64	91.6	100	100	87.62	89.43	81.24	97.59	100	86.06	84.22	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	79.06	100	100												93.02
Window 2		100	100	100											100
Window 3			100	100	85.57										95.19
Window 4				100	97.86	100									99.29
Window 5					100	100	100								100
Window 6						100	100	100							100
Window 7							100	100	100						100
Window 8								100	100	94.91					98.30
Window 9									90.69	82.22	100				90.97
Window 10										82.22	100	100			94.07
Window 11											100	100	81.92		92.05
Window 12												100	90.46	99.45	96.64
Annual Mean	79.06	100	100	100	94.48	100	100	100	96.9	86.45	100	100	86.19	99.45	

Standard Chartered Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	78.78	45.56	0												62.17
Window 2		30.24	0	46.81											38.53
Window 3			0	54.92	48.19										51.56
Window 4				56.54	46.42	87.7									63.55
Window 5					45.16	83.38	86.02								71.52
Window 6						83.38	86.02	73.08							80.83
Window 7							88.18	82.41	79.21						83.27
Window 8								100	98.34	100					99.45
Window 9									82.89	98.74	100				93.88
Window 10										98.74	100	100			99.58
Window 11											100	100	81.92		93.97
Window 12												100	95.96	84.22	93.39
Annual Mean	78.78	37.9		52.76	46.59	84.82	86.74	85.16	86.81	99.16	100	100	88.94	84.22	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	78.78	51.76	0												65.27
Window 2		30.24	0	49.08											39.66
Window 3			0	54.92	48.19										51.56
Window 4				56.54	46.42	87.7									63.55
Window 5					45.16	83.38	100								76.18
Window 6						83.38	100	97.18							93.52
Window 7							100	100	85.13						95.04
Window 8								100	98.34	100					99.45
Window 9									82.89	98.74	100				93.88
Window 10										98.74	100	100			99.58
Window 11											100	100	81.92		93.97
Window 12												100	95.96	84.22	93.39
Annual Mean	78.78	41		53.51	46.59	84.82	100	99.06	88.79	99.16	100	100	88.94	84.22	

Sterling Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	57.78	63.97	100												73.91
Window 2		60.89	77.71	69.18											69.26
Window 3			82.95	73.89	74.9										77.25
Window 4				78.85	70.14	61.74									70.24
Window 5					70.14	42.82	56.67								56.54
Window 6						42.82	56.67	46.67							48.72
Window 7							56.67	46.67	55.84						53.06
Window 8								59.78	66.95	71.48					66.07
Window 9									64.09	73.13	58.3				65.17
Window 10										73.13	59.54	65.49			66.05
Window 11											64.15	65.39	63.25		64.26
Window 12												66.05	67.79	78.17	70.67
Annual Mean	57.78	62.43	86.89	73.97	71.73	49.13	56.67	51.04	62.29	72.58	60.66	65.64	65.52	78.17	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	57.51	63.97	100												73.83
Window 2		60.89	89.35	76.8											75.68
Window 3			89.72	78.14	81.05										82.97
Window 4				80.46	70.14	61.88									70.83
Window 5					70.14	42.82	66.75								59.9
Window 6						42.82	66.75	60.95							56.84
Window 7							62.63	54.65	63.7						60.33
Window 8								59.78	66.95	73.88					66.87
Window 9									64.09	73.13	58.3				65.17
Window 10										73.13	59.54	65.49			66.05
Window 11											64.15	65.39	63.25		64.26
Window 12												66.05	67.79	78.18	70.67
Annual Mean	57.51	62.43	93.02	78.47	73.78	49.17	65.38	58.46	64.91	73.38	60.66	65.64	65.52	78.18	

Stanbic Bank Nigeria   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	82.74	63.25	59.18												68.39
Window 2		62.78	58.77	77.36											66.3
Window 3			67.03	90.89	63.3										73.74
Window 4				80.61	58.62	63.85									67.69
Window 5					51.21	57.53	100								69.58
Window 6						59.52	100	0							79.26
Window 7							100	0	0						100
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	82.74	63.02	61.66	82.95	57.71	60.3	100								

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	82.74	63.25	59.18												68.39
Window 2		62.78	58.77	77.36											66.3
Window 3			67.03	90.89	63.3										73.74
Window 4				80.61	58.62	63.85									67.69
Window 5					51.21	57.53	100								69.58
Window 6						58.52	100	0							79.26
Window 7							100	0	0						100
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	82.74	63.02	61.66	82.95	57.71	59.97	100								

Union Bank of Nigeria   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	60.21	68.96												64.59
Window 2		28.35	39.02	48.72											38.7
Window 3			46.2	53.25	70.23										56.56
Window 4				54.62	62.97	62.56									60.05
Window 5					58.5	53.95	65.19								59.21
Window 6						53.95	65.19	57.44							58.86
Window 7							75.05	57.9	58.25						63.73
Window 8								65.03	72.78	69.23					69.01
Window 9									60.3	69.23	51.79				60.44
Window 10											70.2	52.51	37.78		53.50
Window 11												53.49	39.34	39.38	44.04
Window 12													55.17	69.41	83.67	69.42
Annual Mean		44.28	51.39	52.2	63.9	56.82	68.48	60.12	63.78	69.55	52.6	44.1	54.4	83.67	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	65.35	73.7												69.53
Window 2		59.56	71.59	79.82											70.32
Window 3			67.79	76.92	96.33										80.35
Window 4				58.87	74.24	80.54									71.22
Window 5					74.02	71.05	92.09								79.05
Window 6						72.1	91.26	82.49							81.95
Window 7							89.13	76.87	73.24						79.75
Window 8								100	100	69.23					89.74
Window 9									69.97	69.23	55.95				65.05
Window 10											70.58	57.69	37.78		55.35
Window 11												61.76	39.34	39.38	46.83
Window 12													56.79	82.7	90.05	76.51
Annual Mean		62.46	71.03	71.87	81.54	74.56	90.83	86.45	81.07	69.68	58.47	44.64	61.04	90.04	

United Bank of Africa   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	59.71	40.46	48.64												49.6
Window 2		25.05	33.74	53.41											37.4
Window 3			42.31	63.12	82.88										62.77
Window 4				69.18	76.91	86.24									77.44
Window 5					76.91	86.24	40.16								67.77
Window 6						86.24	40.96	52.67							59.96
Window 7							52.24	54.7	56.93						54.62
Window 8								67.49	72.76	64.15					68.13
Window 9									64.04	56.4	59.39				59.94
Window 10										57.82	62.04	51.7			57.19
Window 11											66.13	57.09	56.14		59.79
Window 12												59.8	65.68	71.52	65.67
Annual Mean	59.71	32.76	41.56	61.9	78.9	86.24	44.45	58.29	64.58	59.46	62.52	56.2	60.91	71.52	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	62.21	46.67	61.54												56.81
Window 2		45.16	61.15	83.87											63.39
Window 3			58.88	82.82	96.41										79.37
Window 4				85.18	90.49	100									91.89
Window 5					89.45	100	100								96.48
Window 6						100	73.88	100							91.29
Window 7							66.45	73.62	86.29						75.45
Window 8								77.95	94.78	100					90.91
Window 9									86.28	71.36	74.52				77.39
Window 10										74.76	68.34	60.56			67.89
Window 11											74.42	61.97	100		78.8
Window 12												64.78	96.37	100	87.05
Annual Mean	62.21	45.92	60.52	83.96	92.12	100	80.11	83.86	89.12	82.04	72.43	62.44	98.19	100	

Unity Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6						0	0	83.86							83.86
Window 7							0	86.22	69.96						78.09
Window 8								86.79	64.5	66.89					72.73
Window 9									51.5	68.06	100				73.19
Window 10										68.06	100	58.56			75.54
Window 11											100	59.58	76.86		78.81
Window 12												79.94	90.78	93.89	88.2
Annual Mean								85.62	61.99	67.67	100	66.03	83.82	93.89	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6						0	0	100							100
Window 7							0	100	87.25						93.63
Window 8								88.55	86.02	68.63					81.07
Window 9									54.02	68.06	100				74.03
Window 10										68.06	100	58.56			75.54
Window 11											100	59.58	76.86		78.81
Window 12												79.94	90.78	94.22	88.31
Annual Mean								96.18	75.76	68.25	100	66.03	83.82	94.22	

Wema Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	77.09	87.26	81.71												82.02
Window 2		78	53.09	52.29											61.13
Window 3			63.21	59.91	82.92										68.68
Window 4				64.9	91.13	95.1									83.71
Window 5					64.18	71.44	95.8								77.14
Window 6						71.44	95.8	67.75							78.33
Window 7							92.74	68.08	0						80.41
Window 8								85.61	0	85.61					85.61
Window 9									0	85.61	57.3				71.46
Window 10										85.68	57.56	39.22			60.82
Window 11											59.88	40.56	51.6		50.68
Window 12												48.63	63.77	60.12	57.55
Annual Mean	77.09	82.63	66	59	79.41	79.33	94.78	73.81		85.63	58.25	42.8	57.69	60.12	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	78.5	90.26	81.71												83.49
Window 2		80.51	61.36	67.17											69.68
Window 3			63.93	65.15	100										76.36
Window 4				66.86	100	100									88.95
Window 5					71.93	100	100								90.64
Window 6						100	100	97.59							99.20
Window 7							100	82.93	0						91.47
Window 8								85.61	0	85.61					85.61
Window 9									0	85.61	57.3				71.46
Window 10										85.68	57.56	39.22			60.82
Window 11											59.88	40.56	51.6		50.68
Window 12												48.76	63.77	60.12	57.55
Annual Mean	78.5	85.39	69	66.39	90.64	100	100	88.71		85.63	58.25	42.85	57.69	60.12	

Zenith Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.61	55.39	70.58												62.53
Window 2		43.16	44.2	50.55											45.97
Window 3			53.2	65.28	72.52										63.67
Window 4				78.81	70.03	91.8									80.21
Window 5					68.79	79.58	71.21								73.19
Window 6						79.58	71.21	53.31							68.03
Window 7							73.39	53.21	63.94						63.51
Window 8								57.85	65.42	74.14					65.8
Window 9									58.19	74.07	70.05				67.44
Window 10										74.7	70.92	68.49			71.37
Window 11											79.61	80.45	71.58		77.21
Window 12												88.28	81.11	84.31	84.57
Annual Mean	61.61	49.28	55.99	64.88	70.45	83.65	71.94	54.79	62.52	74.3	73.53	79.07	76.35	84.31	

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	70.49	65.18	74.2												69.96
Window 2		54.94	54.13	80.42											63.16
Window 3			55.92	73.81	83.69										71.14
Window 4				88.3	82.01	100									90.10
Window 5					79.01	100	100								93
Window 6						97.27	97.02	76.83							90.37
Window 7							86.13	74.96	100						87.03
Window 8								97.18	100	100					99.06
Window 9									100	100	100				100
Window 10										100	95.72	100			98.57
Window 11											100	100	100		100
Window 12												100	100	100	100
Annual Mean	70.49	60.06	61.42	80.84	81.57	99.09	94.38	82.99	100	100	98.57	100	100	100	

Oceanic Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	68.32	93.27	63.43												75.01
Window 2		59.16	44.31	37.09											46.85
Window 3			57.61	52.35	53.27										54.41
Window 4				86.34	66.8	89.55									80.90
Window 5					65.07	73.76	52.79								63.87
Window 6						73.76	52.79	79.32							68.62
Window 7							67.53	70.82	68.09						68.81
Window 8								83.03	77.08	100					86.7
Window 9									77.08	100	46.93				74.67
Window 10										100	47.72	0			73.86
Window 11											50.99	0	0		50.99
Window 12												0	0	0	
Annual Mean	68.32	76.22	55.12	58.59	61.71	79.02	57.7	77.72	74.08	100	48.55				

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	68.32	93.27	63.43												75.01
Window 2		75.99	52.49	53.34											60.61
Window 3			57.61	53.34	60.94										57.3
Window 4				96.06	76.58	100									90.88
Window 5					71.42	100	100								90.47
Window 6						89.77	78.86	100							89.54
Window 7							73.84	95.39	100						89.74
Window 8								88.88	87.07	100					91.98
Window 9									85.67	100	46.93				77.53
Window 10										100	47.72	0			73.86
Window 11											51.33	0	0		51.33
Window 12												0	0	0	
Annual Mean	68.32	84.63	57.84	67.58	69.65	96.59	84.23	94.76	90.91	100	48.66				

Intercontinental Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	60.86	51.78	58.77												57.14
Window 2		45.88	43.36	44.92											44.72
Window 3			49.92	53.68	0										51.8
Window 4				48.8	0	68.14									58.47
Window 5					0	57.22	83.47								70.35
Window 6						57.22	83.47	71.79							70.83
Window 7							79.66	72.05	65.3						72.34
Window 8								85.46	68.96	73.79					76.07
Window 9									64.5	73.79	39.62				59.3
Window 10										73.82	39.86	0			56.84
Window 11											40.48	0	0		40.48
Window 12												0	0	0	
Annual Mean	60.86	48.83	50.68	49.13		60.86	82.2	76.43	66.25	73.8	39.99				

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	66.38	59.88	60.02												62.09
Window 2		59.9	54.74	71.46											62.03
Window 3			55.85	68.44	0										62.15
Window 4				62.13	0	100									81.07
Window 5					0	100	100								100
Window 6						96.3	100	100							98.77
Window 7							96.54	100	100						98.85
Window 8								100	100	74.34					91.45
Window 9									100	74.34	44.87				73.07
Window 10										74.34	44.61	0			59.48
Window 11											48.4	0	0		48.4
Window 12															
Annual Mean	66.38	59.89	56.87	67.34		98.77	98.85	100	100	74.34	45.96				

First Interstate Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	93.12	57.52	81.68												77.44
Window 2		45.49	58.57	0											52.03
Window 3			63.88	0	0										63.88
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	93.12	51.51	68.04												

BCC Efficiency Scores   Summary Measures

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	93.12	57.52	81.68												77.44
Window 2		45.49	58.57	0											52.03
Window 3			63.88	0	0										63.88
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	93.12	51.51	68.88												

International Trust Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	79.87												79.87
Window 2		0	77.41	73.61											75.51
Window 3			82.91	77.78	0										80.35
Window 4				76.99	0	0									76.99
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			80.06	76.13											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	79.87												79.87
Window 2		0	77.41	73.61											75.51
Window 3			82.91	77.78	0										80.35
Window 4				76.99	0	0									76.99
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			80.06	76.13											

FSB International Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	73.96	82.27	62.54												72.92
Window 2		79.02	59.62	57.82											65.49
Window 3			65.55	63.08	64										64.21
Window 4				59.79	63.31	0									61.55
Window 5					43.77	0	0								43.77
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	73.96	80.65	62.57	60.23	57.03										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	75	87.8	69.32												77.37
Window 2		87.8	69.32	64.83											73.98
Window 3			71.67	68.73	69.16										69.85
Window 4				61.68	62.22	0									61.95
Window 5					44.85	0	0								44.85
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	75	87.8	70.1	65.08	58.74										

Fountain Trust Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	59.8	39.28	37												45.36
Window 2		39.28	37	43.1											39.79
Window 3			54.28	55.52	0										54.9
Window 4				61.24	0	0									61.24
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	59.8	39.28	42.76	53.29											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	59.8	39.28	37												45.36
Window 2		39.28	37	45.06											40.45
Window 3			54.28	55.52	0										54.9
Window 4				61.24	0	0									61.24
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	59.8	39.28	42.76	53.94											

lnland Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	73.48	77.33												75.41
Window 2		70.17	75.69	0											72.93
Window 3			81.93	0	0										81.93
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		71.83	78.32												

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	73.83	78.77												76.3
Window 2		70.18	78.6	0											74.39
Window 3			81.93	0	0										81.93
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		72.01	79.77												

Manny Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	87.29	60.07												82.45
Window 2		81.7	58	74.39											71.36
Window 3			71.01	78.97	100										83.33
Window 4				82.36	100	0									91.18
Window 5					69.94	0	0								69.94
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	100	84.5	63.03	78.57	89.98										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	89.06	60.17												83.08
Window 2		81.7	58	74.39											71.36
Window 3			71.01	78.97	100										83.33
Window 4				82.36	100	0									91.18
Window 5					69.94	0	0								69.94
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	100	85.38	63.06	78.57	89.98										

Trade Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	57.34	56.88	0												57.11
Window 2		52.52	0	0											52.52
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	57.34	54.7													

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	57.34	56.88	0												57.11
Window 2		52.52	0	0											52.52
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	57.34	54.7													

Triumph Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	80.39	74.55	55.39												70.11
Window 2		73.77	55.04	0											64.41
Window 3			76.92	0	0										76.92
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	80.39	74.16	62.45												

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	80.39	74.55	55.39												70.11
Window 2		73.77	55.04	0											64.41
Window 3			76.92	0	0										76.92
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	80.39	74.16	62.45												

Bank PHB (Platinum Bank 2000 – 2004)   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	44.41	40.2												42.31
Window 2		42.52	40.2	52.63											45.12
Window 3			53.23	58.61	50.83										54.22
Window 4				60.7	46.93	89.08									65.57
Window 5					40.9	71.99	61.64								58.18
Window 6						71.99	61.98	73.4							69.12
Window 7							80.36	93.16	74.25						82.59
Window 8								91.7	92.18	69.79					84.56
Window 9									88.15	55.28	0				71.72
Window 10										55.28	0	0			55.28
Window 11															
Window 12															
Annual Mean		43.47	44.54	57.31	46.22	77.69	67.99	86.09	84.86	60.12					

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	44.41	41.27												42.84
Window 2		42.52	41.27	54.18											45.99
Window 3			53.23	58.61	50.83										54.22
Window 4				60.7	46.93	93.14									66.92
Window 5					40.9	72.05	82.62								65.19
Window 6						72.05	72.14	100							81.4
Window 7							82.63	100	100						94.21
Window 8								98.81	100	100					99.6
Window 9									100	95.12	0				97.56
Window 10										95.12	0	0			95.12
Window 11															
Window 12															
Annual Mean		43.47	45.26	57.83	46.22	79.08	79.13	99.6	100	96.75					

New Africa Merchant Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	58.56	85.59	0												72.08
Window 2		83.26	0	0											83.26
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	58.56	84.43													

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	58.56	85.59	0												72.08
Window 2		83.26	0	0											83.26
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	58.56	84.43													

FBN Merchant Bankers   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	68.3	82.12	69.07												73.16
Window 2		82.12	69.07	0											75.6
Window 3			76.27	0	0										76.27
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	68.3	82.12	71.47												

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	68.3	83.27	72.28												74.62
Window 2		83.27	72.28	0											77.78
Window 3			76.27	0	0										76.27
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	68.3	83.27	73.61												

IMB International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	69.4	59.3	0												64.35
Window 2		55.66	0	0											55.66
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	69.4	57.48													

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	69.4	59.3	0												64.35
Window 2		55.66	0	0											55.66
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	69.4	57.48													

Chartered Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	54.2	55.42	71.65												60.42
Window 2		41.89	57.52	60.36											53.26
Window 3			65.76	69.06	71										68.61
Window 4				89.01	97.11	88.43									91.52
Window 5					55.53	55.31	0								55.42
Window 6						55.31	0	0							55.31
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	54.2	48.66	64.98	72.81	74.55	66.35									

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	54.2	55.42	72.08												60.57
Window 2		42.72	65.98	93.49											67.40
Window 3			67.98	83.63	97.88										83.16
Window 4				91.63	100	93.98									95.2
Window 5					55.53	55.31	0								55.42
Window 6						55.31	0	0							55.31
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	54.2	49.07	68.68	89.58	84.47	68.2									

Equity Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	65.41	0	57.36												61.39
Window 2		0	51.73	68.56											60.15
Window 3			58.45	79.99	0										69.22
Window 4				73.96	0	0									73.96
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	65.41		55.85	74.17											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	65.85	0	61.07												63.46
Window 2		0	55.62	78.77											67.2
Window 3			58.45	84.18	0										71.32
Window 4				74.27	0	0									74.27
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	65.85		58.38	79.07											

Bank of the North   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	77.86	0	85.26												81.56
Window 2		0	83.99	0											83.99
Window 3			91.03	0	0										91.03
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	77.86		86.76												

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	0	100												100
Window 2		0	100	0											100
Window 3			100	0	0										100
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	100		100												

Lion Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3			0	0	58.02										58.02
Window 4				0	53.2	79.6									66.4
Window 5					48.07	57.54	0								52.81
Window 6						57.54	0	0							57.54
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean					53.1	64.89									

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3			0	0	58.02										58.02
Window 4				0	53.2	79.6									66.4
Window 5					48.07	57.54	0								52.81
Window 6						57.54	0	0							57.54
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean					53.1	64.89									

Trans International Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	58.38	71.36	68.91												66.22
Window 2		39.83	56.92	58.22											51.66
Window 3			61.71	62.91	68.64										64.42
Window 4				70.84	67.25	0									69.05
Window 5					53.98	0	0								53.98
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	58.38	55.6	62.51	63.99	63.29										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	58.38	71.36	68.91												66.22
Window 2		39.83	56.92	60.5											52.42
Window 3			61.71	62.91	69.25										64.62
Window 4				70.85	67.25	0									69.05
Window 5					53.98	0	0								53.98
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	58.38	55.6	62.51	64.75	63.49										

Societe Generale Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	40.58	36.75	0												38.67
Window 2		36.75	0	0											36.75
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	40.58	36.75													

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	40.58	39.95	0												40.27
Window 2		39.95	0	0											39.95
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	40.58	39.95													

Intercity Bank　　　　　　　　　　　　　　　　　　　　　　CCR Efficiency Scores

Windows	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	84.49	76.97	81.09												80.85
Window 2		55.77	70.17	67.12											64.35
Window 3			78.24	73.98	0										76.11
Window 4				71.64	0	0									71.64
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	84.49	66.37	76.5	70.91											

BCC Efficiency Scores

Windows	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	84.49	76.97	81.09												80.85
Window 2		55.77	72.38	71.49											66.55
Window 3			78.29	75.21	0										76.75
Window 4				71.64	0	0									71.64
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	84.49	66.37	77.25	72.78											

Habib Nigeria Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	58.61	79.65	78.72												72.33
Window 2		44.14	55.71	59.55											53.13
Window 3			63.95	70.93	71.69										68.86
Window 4				71.55	70.13	0									70.84
Window 5					52.5	0	0								52.5
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	58.61	61.9	66.13	67.34	64.77										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.53	89.3	88.94												79.92
Window 2		49.53	63.72	71.34											61.53
Window 3			65.45	73.26	77.12										71.94
Window 4				71.72	72.11	0									71.92
Window 5					53.55	0	0								53.55
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.53	69.42	72.7	72.11	67.59										

MBC International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	65.9	69.07	60.17												65.05
Window 2		69.07	60.17	0											64.62
Window 3			88.95	0	0										88.95
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	65.9	69.07	69.76												

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	66.32	74.59	65.88												68.93
Window 2		74.59	65.88	0											70.24
Window 3			88.95	0	0										88.95
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	66.32	74.59	73.57												

NNB International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	39.35												39.35
Window 2		0	37.43	28.66											33.05
Window 3			43.49	46.22	45.64										45.12
Window 4				53.07	50.42	0									51.75
Window 5					50.45	0	0								50.45
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			40.09	42.65	48.84										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	39.56												39.35
Window 2		0	37.43	30.04											33.74
Window 3			43.49	46.22	45.64										45.12
Window 4				53.07	50.42	0									51.75
Window 5					50.45	0	0								50.45
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			40.16	43.11	48.84										

Reliance Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	43.53												43.53
Window 2		0	38.75	37.35											38.05
Window 3			44.51	45.42	0										44.97
Window 4				51.53	0	0									51.53
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			42.26	44.77											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	43.53												43.53
Window 2		0	38.75	37.35											38.05
Window 3			44.51	45.42	0										44.97
Window 4				51.53	0	0									51.53
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			42.26	44.77											

Assurance Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	100	0												100
Window 2		100	0	58.19											79.1
Window 3			0	65.81	0										65.81
Window 4				68.78	0	0									68.78
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		100		64.26											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	100	0												100
Window 2		100	0	58.21											79.11
Window 3			0	65.81	0										65.81
Window 4				68.78	0	0									68.78
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		100		64.27											

Cooperative Development Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	71.28	87.04	83.53												80.62
Window 2		81.84	69.74	81.02											77.53
Window 3			73.09	84.36	0										78.73
Window 4				87.7	0	0									87.7
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	71.28	84.44	75.45	84.36											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	71.28	87.83	100												86.37
Window 2		81.84	69.74	82.18											77.92
Window 3			73.09	84.36	0										78.73
Window 4				87.7	0	0									87.7
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	71.28	84.84	80.94	84.75											

DevCom Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	55.11	0	0												55.11
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	55.11														

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	55.11	0	0												55.11
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	55.11														

Equitorial Trust Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	74.79	80.33	83.77												79.63
Window 2		62.47	54.35	64.22											60.35
Window 3			58.98	68.68	61.55										63.07
Window 4				71	64.19	72.54									69.24
Window 5					52.26	60.76	45.63								52.88
Window 6						60.76	45.63	41.04							49.14
Window 7							45.63	49.01	0						47.32
Window 8								68.0	0	40.92					54.46
Window 9									0	41.28	58.64				49.96
Window 10										41.28	58.91	0			50.1
Window 11											62.28	0	0		62.28
Window 12															
Annual Mean	74.79	71.4	65.7	67.97	59.33	64.69	45.63	52.68		41.16	59.94				

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	74.79	80.68	87.47												80.97
Window 2		69.23	60.67	75.53											68.48
Window 3			61.55	76.26	69.93										69.25
Window 4				75.33	69.3	80.18									74.94
Window 5					52.26	65.13	50.73								56.04
Window 6						65.13	50.73	47.77							54.54
Window 7							48.1	51.02	0						49.56
Window 8								68.2	0	40.92					54.46
Window 9									0	41.28	58.64				49.96
Window 10										41.28	58.91	0			50.1
Window 11											62.28	0	0		62.28
Window 12															
Annual Mean	74.79	74.96	69.9	75.71	63.83	70.15	49.85	55.66		41.16	59.94				

Centre-Point Merchant Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	62.1	100	0												81.05
Window 2		100	0	0											100
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	62.1	100													

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	62.1	100	0												81.05
Window 2		100	0	0											100
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	62.1	100													

Gateway Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	60.62	75.41	70.14												68.72
Window 2		61.17	60.28	68.64											63.36
Window 3			65.01	72.94	0										68.98
Window 4				71.56	0	0									71.56
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	60.62	68.29	65.14	71.05											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	60.62	75.41	70.14												68.72
Window 2		61.17	60.28	70.57											64.01
Window 3			65.01	72.94	0										68.98
Window 4				71.56	0	0									71.56
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	60.62	68.29	65.14	71.69											

Afribank Nigeria   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	48.25	51.09	60.73												53.36
Window 2		42.35	54.28	46.84											47.82
Window 3			60.58	53.09	51.81										55.16
Window 4				51.93	50.04	59.97									53.98
Window 5					41.97	48.56	53.07								47.87
Window 6						48.56	53.07	81.03							60.89
Window 7							56.27	86.67	0						71.47
Window 8								86.78	0	100					93.39
Window 9									0	100	27.19				63.6
Window 10										100	27.5	0			63.75
Window 11											28.96	0	0		28.96
Window 12															
Annual Mean	48.25	46.72	58.53	50.62	48.06	52.36	54.14	84.83		100	27.88				

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	48.4	56.22	81.23												61.95
Window 2		51.51	77.37	68.41											65.76
Window 3			74.14	64.93	62.66										67.24
Window 4				59.44	58.06	68.39									61.96
Window 5					54.78	63.8	62.54								60.37
Window 6						64.3	62.75	100							75.68
Window 7							61.18	100	0						80.59
Window 8								90.38	0	100					95.19
Window 9									0	100	27.19				63.6
Window 10										100	27.5	0			63.75
Window 11											28.96	0	0		28.96
Window 12															
Annual Mean	48.4	53.87	77.58	64.26	58.5	65.5	62.16	96.79		100	27.88				

Hallmark Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	52.63	62.63	63.12												59.46
Window 2		56.49	57.19	65.18											59.62
Window 3			61.87	72.05	0										66.96
Window 4				78.34	0	0									78.34
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	52.63	59.56	60.73	71.86											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	52.63	63.77	67.81												61.4
Window 2		62.98	67.81	87.38											72.72
Window 3			68.55	82.4	0										75.48
Window 4				87.78	0	0									87.78
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	52.63	63.38	68.06	85.85											

National Bank of Nigeria   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	100	57.91												85.97
Window 2		100	57.91	55.26											71.06
Window 3			78.06	73.42	80.47										77.32
Window 4				81.93	100	0									90.97
Window 5					100	0	0								100
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	100	100	64.63	70.2	93.49										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	100	58.92												86.31
Window 2		100	58.92	58.71											72.54
Window 3			78.06	73.42	80.47										77.32
Window 4				81.93	100	0									90.97
Window 5					100	0	0								100
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	100	100	65.3	71.35	93.49										

Broad Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	31.52	54.94												43.23
Window 2		23.76	47.71	69.11											46.86
Window 3			59.92	80.46	52.91										64.43
Window 4				71.24	44.41	0									57.83
Window 5					44.41	0	0								44.41
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		27.64	54.19	73.6	47.24										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	31.52	54.94												43.23
Window 2		23.76	47.71	69.31											46.93
Window 3			59.92	80.46	52.91										64.43
Window 4				71.24	44.41	0									57.83
Window 5					44.41	0	0								44.41
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		27.64	54.19	73.67	47.24										

Marina International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	78.8	81.95	75.1												78.62
Window 2		71.76	60.14	33.91											55.27
Window 3			63.68	37.96	65.66										55.77
Window 4				36.6	63.96	64.16									54.91
Window 5					51.75	51.42	0								51.59
Window 6						51.42	0	0							51.42
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	78.8	76.86	66.31	36.16	60.46	55.67									

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	78.8	81.95	78.56												79.77
Window 2		71.76	60.14	33.91											55.27
Window 3			63.68	37.96	65.66										55.77
Window 4				36.6	63.96	64.16									54.91
Window 5					51.75	51.42	0								51.59
Window 6						51.42	0	0							51.42
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	78.8	76.86	67.46	36.16	60.46	55.67									

Lead Bank   CCR Efficiency Scores

Windows	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	94.76	100	100												98.25
Window 2		87.51	89.51	81.36											86.13
Window 3			94.56	88.11	88.96										90.54
Window 4				100	96.57	0									98.29
Window 5					76.21	0	0								76.21
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	94.76	93.76	94.69	89.82	87.25										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	94.76	100	100												98.25
Window 2		87.51	89.51	81.36											86.13
Window 3			94.56	88.11	88.96										90.54
Window 4				100	96.57	0									98.29
Window 5					76.21	0	0								76.21
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	94.76	93.76	94.69	89.82	87.25										

Regent Bank   CCR Efficiency Scores

Windows	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	57.73												57.73
Window 2		0	50.33	30.64											40.49
Window 3			60.58	38.54	49.13										49.42
Window 4				31.15	45.77	55.52									44.15
Window 5					38.39	47.28	0								42.84
Window 6						47.28	0	0							47.28
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			56.21	33.44	44.43	50.03									

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	57.73												57.73
Window 2		0	50.33	30.64											40.49
Window 3			60.58	38.54	49.13										49.42
Window 4				31.15	45.77	55.52									44.15
Window 5					38.39	47.28	0								42.84
Window 6						47.28	0	0							47.28
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			56.21	33.44	44.43	50.03									

Gulf Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.51	75.26	93.55												76.77
Window 2		50.49	78.24	76.78											68.50
Window 3			83.06	80.3	0										81.68
Window 4				82.45	0	0									82.45
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.51	62.88	84.95	79.84											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.51	75.26	93.55												76.77
Window 2		50.49	78.24	81.77											70.17
Window 3			83.06	82.8	0										82.93
Window 4				82.45	0	0									82.45
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.51	62.88	84.95	82.34											

Guardian Express Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	57.65												57.65
Window 2		0	35.62	49.62											42.62
Window 3			46.28	62.09	0										54.19
Window 4				55.89	0	0									55.89
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			46.52	55.87											

CCR Efficiency Scores

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	57.65												57.65
Window 2		0	35.62	49.62											42.62
Window 3			46.28	62.09	0										54.19
Window 4				55.89	0	0									55.89
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			46.52	55.87											

Citizens International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	53.43	50.6	51.02												51.68
Window 2		39.1	44.59	44.87											42.85
Window 3			49.39	48.47	0										48.93
Window 4				54.47	0	0									54.47
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	53.43	44.85	48.33	49.27											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	53.43	51.51	56.12												53.69
Window 2		42.97	55.26	59.5											52.58
Window 3			56.17	55.93	0										56.05
Window 4				62.05	0	0									62.05
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	53.43	47.24	55.85	59.16											

EIB International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.6	80.36	0												70.98
Window 2		72.16	0	57.28											64.72
Window 3			0	77.34	0										77.34
Window 4				71.5	0	0									71.5
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.6	76.26		68.71											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	62.69	91.83	0												77.26
Window 2		80.11	0	68.63											74.37
Window 3			0	77.83	0										77.83
Window 4				71.5	0	0									71.5
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	62.69	85.97		72.65											

First Atlantic Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	85.54	80.19	74.88												80.2
Window 2		73.83	53.65	60.52											62.67
Window 3			58.76	70.9	54.43										61.36
Window 4				75.84	60.51	0									68.18
Window 5					44.81	0	0								44.81
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	85.54	77.01	62.43	69.09	53.25										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	85.54	80.19	80.92												82.22
Window 2		73.83	53.65	62.55											63.34
Window 3			58.76	70.9	54.43										61.36
Window 4				75.84	60.51	0									68.18
Window 5					44.81	0	0								44.81
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	85.54	77.01	64.44	69.76	53.25										

NUB International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	100	23.68												61.84
Window 2		100	14.96	35.87											50.28
Window 3			22.52	42.39	46.58										37.16
Window 4				42.79	52.08	0									47.44
Window 5					49.78	0	0								49.78
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		100	20.39	40.35	49.48										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	100	23.68												61.84
Window 2		100	14.96	35.87											50.28
Window 3			22.52	42.39	46.58										37.16
Window 4				42.79	52.08	0									47.44
Window 5					49.78	0	0								49.78
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		100	20.39	40.35	49.48										

Standard Trust Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.45	60.7	60.09												60.75
Window 2		49.15	45.95	41.35											45.48
Window 3			51.16	46.97	49.4										49.18
Window 4				61.58	71.75	0									66.67
Window 5					44.1	0	0								44.1
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.45	54.93	52.4	49.97	55.08										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.73	71.49	73.71												68.98
Window 2		73.46	76.05	74.56											74.69
Window 3			67.15	72.42	87.4										75.66
Window 4				70	82.67	0									76.34
Window 5					50.65	0	0								50.65
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.73	72.48	72.3	72.33	73.57										

Continental Trust Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	64.79	62.37	80.82												69.33
Window 2		52.59	80.82	0											66.71
Window 3			87.81	0	0										87.81
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	64.79	57.48	83.15												

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	64.79	62.37	91.49												72.88
Window 2		52.59	91.49	0											71.04
Window 3			92.29	0	0										92.29
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	64.79	57.48	91.76												

Metropolitan Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	36.06	0	71.97												54.02
Window 2		0	54.31	62.67											58.49
Window 3			58.3	69.74	0										64.02
Window 4				75.79	0	0									75.79
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	36.06		61.53	69.4											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	36.06	0	71.97												54.02
Window 2		0	54.31	62.72											58.52
Window 3			58.3	69.74	0										64.02
Window 4				75.79	0	0									75.79
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	36.06		61.53	69.42											

Bond Bank

CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3			0	0	61.23										61.23
Window 4				0	56.64	0									56.64
Window 5					56.64	0	0								56.64
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean					58.17										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3			0	0	61.23										61.23
Window 4				0	56.64	0									56.64
Window 5					56.64	0	0								56.64
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean					58.17										

All States Trust Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	41.47	63.37	0												52.42
Window 2		27.42	0	22.67											25.05
Window 3			0	31.88	42.59										37.24
Window 4				30.65	39.62	50.24									40.17
Window 5					31.42	35.99	0								33.71
Window 6						35.99	0	0							35.99
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	41.47	45.4		28.4	37.88	40.74									

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	48.89	82.54	0												65.72
Window 2		39.34	0	33.48											36.41
Window 3			0	34.13	48.55										41.34
Window 4				30.65	40.43	59.46									43.51
Window 5					31.42	48.79	0								40.11
Window 6						48.79	0	0							48.79
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	48.89	60.94		32.75	40.13	52.35									

City Express Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	54.61	65.3	65.28												61.73
Window 2		59.1	61.68	62.39											61.06
Window 3			67.45	68.13	0										67.79
Window 4				62.86	0	0									62.86
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	54.61	62.2	64.8	64.46											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	54.61	65.3	65.39												61.77
Window 2		59.1	62.2	63.05											61.45
Window 3			67.45	68.13	0										67.79
Window 4				62.86	0	0									62.86
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	54.61	62.2	65.01	64.68											

NBM Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	70.62	56.28	61.52												62.81
Window 2		54.43	60.08	65.8											60.1
Window 3			63.03	74.45	0										68.74
Window 4				69.05	0	0									69.05
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	70.62	55.36	61.54	69.77											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	70.62	56.28	61.67												62.86
Window 2		54.43	60.08	68.59											61.03
Window 3			63.03	74.45	0										68.74
Window 4				69.05	0	0									69.05
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	70.62	55.36	61.59	70.7											

Universal Trust Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.1	56.49	69.83												62.47
Window 2		56.49	61.07	51.07											56.21
Window 3			71.46	56.05	0										63.76
Window 4				52.71	0	0									52.71
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.1	56.49	67.45	53.28											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	61.11	82.15	71.72												71.66
Window 2		82.14	70.28	56.21											69.54
Window 3			76.16	59.36	0										67.76
Window 4				53.04	0	0									53.04
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	61.11	82.15	72.72	56.2											

African Express Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	93.14	43.21												68.18
Window 2		57.48	37.74	0											47.61
Window 3			61.65	0	0										61.65
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		75.31	47.53												

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	93.14	51.67												72.41
Window 2		57.48	37.74	0											47.61
Window 3			61.65	0	0										61.65
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean		75.31	50.35												

Omega Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	66.86	51.94	0												59.4
Window 2		48.19	0	43.04											45.62
Window 3			0	55.66	0										55.66
Window 4				51.1	0	0									51.1
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	66.86	50.07		49.93											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	67.08	53.33	0												60.21
Window 2		52.12	0	48.28											50.2
Window 3			0	55.66	0										55.66
Window 4				51.1	0	0									51.1
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	67.08	52.73		51.68											

Fortune International Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	71.5	85.08	100												85.53
Window 2		70.79	100	89.72											86.84
Window 3			100	93.57	0										96.79
Window 4				100	0	0									100
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	71.5	77.94	100	94.43											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	71.5	85.08	100												85.53
Window 2		71.53	100	93.39											88.31
Window 3			100	93.7	0										96.85
Window 4				100	0	0									100
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	71.5	78.31	100	95.7											

Indo-Nigerian Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	86.75	84.62												90.46
Window 2		75.7	56.29	71.54											67.84
Window 3			60.07	77.39	88.17										75.21
Window 4				80.81	84.95	0									82.88
Window 5					62.11	0	0								62.11
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	100	81.23	66.99	76.58	78.41										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	100	86.75	86.24												91
Window 2		75.7	56.29	71.54											67.84
Window 3			60.07	77.39	88.17										75.21
Window 4				80.81	84.95	0									82.88
Window 5					62.11	0	0								62.11
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	100	81.23	65.53	76.58	78.41										

Magnum Trust Bank CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	53.27												53.27
Window 2		0	52.95	48.16											50.56
Window 3			64.03	53.77	0										58.9
Window 4				56.57	0	0									56.57
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			56.75	52.83											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	0	0	54.32												54.32
Window 2		0	54.32	48.42											51.37
Window 3			64.03	53.77	0										58.9
Window 4				56.57	0	0									56.57
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean			57.56	52.92											

Capital Bank International   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	53.96	65.15	59.08												59.4
Window 2		61.57	54.13	60.53											58.74
Window 3			61.37	65.74	55										60.7
Window 4				60.5	51.29	0									55.9
Window 5					43.28	0	0								43.28
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	53.96	63.36	58.19	62.26	49.86										

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	55.07	66.51	59.38												60.32
Window 2		63.34	55.35	62.27											60.32
Window 3			61.37	65.74	55										60.7
Window 4				60.5	51.29	0									55.9
Window 5					43.28	0	0								43.28
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	55.07	64.93	58.7	62.84	49.86										

Co-operative Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	66.61	54.63	84.05												68.43
Window 2		53.76	79.34	87.68											73.59
Window 3			95.72	100	0										97.86
Window 4				100	0	0									100
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	66.61	54.2	86.37	95.89											

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	66.61	55.6	84.67												68.96
Window 2		55.34	82.65	98.18											78.72
Window 3			95.72	100	0										97.86
Window 4				100	0	0									100
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	66.61	55.47	87.68	99.39											

FinBank

CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6						0	0	60.01							60.01
Window 7							0	64.64	50.89						57.77
Window 8								81.14	70.59	0					75.87
Window 9									68.96	0	0				68.96
Window 10															
Window 11															
Window 12															
Annual Mean								68.6	63.48						

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1															
Window 2															
Window 3															
Window 4															
Window 5															
Window 6						0	0	96.76							96.76
Window 7							0	94.54	66.68						80.61
Window 8								89.75	70.59	0					80.17
Window 9									68.96	0	0				68.96
Window 10															
Window 11															
Window 12															
Annual Mean								93.68	68.74						

Peak Merchant Bank   CCR Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	70.83	0	0												70.83
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	70.83														

BCC Efficiency Scores

Window	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Mean
Window 1	70.83	0	0												70.83
Window 2															
Window 3															
Window 4															
Window 5															
Window 6															
Window 7															
Window 8															
Window 9															
Window 10															
Window 11															
Window 12															
Annual Mean	70.83														

Appendix 12: CAMEL(S) Proxies used in Literature

Author	Capital Adequacy	Asset Quality	Management Quality	Earnings	Liquidity	Bank Size/Sensitivity to Risk
(Chiaramonte, Croci, & Poli, 2015)	• Equity to Total Assets Ratio	• Impaired Loans to Gross Loans Ratio	• Cost to Income Ratio	• Return on Average Assets (ROAA)	• Net Loans to Deposit & Short Term Funding	• Non-Interest Income to Net Operating Revenue Ratio
(Nurazi & Evans, 2005)	• Equity Capital-Fixed Assets/Total Loan + Securities • Equity Capital/Total Assets	• Earnings Before Income Tax/Productive Assets • Off-Balance Sheet Activities/Equity Capital	• Net Income/Total (ROA) • Net Income – Interest Expense/Total Assets	• Earning After Tax/Operating Income or Sales • Operating Expense/Operating Income	• Total Loan/Total Deposits • Total Loans/Total Assets • Cash/Total Assets • Cash & Bank/Total Deposit • Growth in Loan	• Market Price per Ordinary Equity Share/Earning Per Share • Bank Size* Natural Logarithm of Total Assets
(Koetter et al., 2007)	• Total Capital Reserves/Total Assets	• Securities to Risk-Weighted Assets • Loan Loss Provision/Total Customer Credits	• Stochastic Frontier Analysis	• Operating Returns/Risk Weighted Assets	• Cash & Inter-Bank Assets/Risk Weighted Assets	
(W.-K. Wang, Lu, & Wang, 2013)	• Total Capital Reserves/Total Assets	• Impaired Assets/Total Loans • Loan Loss	• Cost to Income Ratio	• Return on Assets (ROA) • Net Interest	• Cash & Inter Bank Assets/Risk-	

	• Equity/Total Assets	Provision/Total Customer Credits	• Non-Interest Expense/Total Assets	margin (NIM)	Weighted Assets • Deposits/Total Liabilities	
(Ongore & Kusa, 2013)	• Total Capital/Total Assets	• Non-Performing Loans/Total Loans	• Total operating Revenue/Total Profit	• Return on Assets (ROA) • Return on Equity (ROE) • Net Interest Margin (NIM)	• Total Loans/Total Customer Deposits	
(Sahut & Mili, 2011)	• Equity/Total Assets • Equity/Total Loans • Equity + Loan Loss reserve/Loans	• Loan Loss Reserve/Gross Loans • Loans Growth	• DEA Efficiency Scores	• Return on Assets (ROA) • Return on Equity (ROE) • Net Interest Income/Total Revenue • Loan Loss Provision • Personnel Expenses	• Deposits/Total Assets	• Bank Size * Log of Total Assets
(Bhatia & Mahendru, 2015)	• Capital Adequacy ratio • Debt Equity Ratio	• Non-performing Loans/Net Advances • Total Investments/Total assets	• Total Expenses/ Total Income • Operating Expenses/Total Expenses	• Return on Assets (ROA) • Spread to Total Assets	• Government Securities/Total Investments • Liquid Assets/Total Assets	• Bank Size * Log of Total Assets
(Wong, Deng, Tseng, Lee, & Hooy, 2014)	• Total Assets/Total Shareholders' Funds • Total Shareholders' Funds/Total	• Loan Loss Provision/Total Net Loans • Loan Loss Provision/Gross loans	• Total Risk Weighted Assets/Total Assets	• Return on Assets (ROA) • Return on Equity (ROE)	• Total Net Loans/Total Deposits • Demand Liabilities/Total Deposits • Gross	

	Assets • Total Shareholders' Funds/Total Net Loans • Total Shareholders' Funds/Total Deposits • Total Shareholders' Funds/Contingent Liabilities • Total Shareholders' Funds/Total Risk Weighted Assets				Loans/Total Deposits	
(Karapinar & Dogan, 2015)	• Capital Adequacy Ratio • Equity/Total Liabilities • Equity/Loans • Paid-Up Capital/Equity	• Loans/Total Assets • Immovable Assets/Total Assets • Non-Performing Loans (Gross)/Total Loans • Non-Performing Loan Reserves/Total Loans • Bearing Assets/Total Assets	• Non-Performing Loans/Total Loans • Net Income Per Branch • Net Income Per Employee • Non-Interest Income/Total Assets • Non-Interest Income/Non-Interest Expenses	• Return on Assets (ROA) • Return on Equity (ROE) • Non-Interest Income/Non-Interest Expenses • Total Interest Income/Bearing Assets • Total Interest Expenses/Costly Liabilities • Net Interest Margin (NIM)	• Liquid Assets/Total Assets • Liquid Assets/Total Foreign Liabilities • Deposits/Equity • Foreign Money Liquid Assets/FM Liabilities	• Securities Portfolio/Total Assets • Bearing Assets/Costly Liabilities • Net Interest Income/Total Assets • Foreign Currency Total Assets/FM

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						Total Liabilities
(Hadriche, 2015)	• Equity/Total Assets	• Non-Performing Loans/Total Loans	• Total Loans/Total Deposits	• Return on Equity (ROE) • Return on Assets (ROA)	• Liquid Assets/Deposit & Short Term Funding • Net Loans/Deposit & Short Term Funding	
(Christopoulos, Mylonakis, & Diktapani, 2011)	• Capital Adequacy Ratio	• Non-Performing Loans/Total Loans	• Management Expenses/Sales	• Return on Assets (ROA) • Return on Equity (ROE)	• Total Loans/Total Deposits • Circulating Assets/Total Assets	• Total Securities/ Total Assets
(Mayes & Stremmel, 2012)	• Leverage Ratio • Risk-Based Capital Ratio • Gross Revenue Ratio	• Non-Performing Loans/Total Loans	• Efficiency Ratio (Provided by the FDIC)	• Net Operating Income/Asset Ratio	• Loan to Deposit Ratio	• Total Volatile Liabilities/ Total Assets
(Boyacioglu, Kara, & Baykan, 2009)	• Shareholder's Equity/Total Assets • Shareholder's Equity/Total Loans • Shareholder's Equity + Net Profit/Total Assets + Off Balance Sheet Commitments	• Permanent Assets/Total Assets • Total Loans/Total Loans • Loans under Follow-Up/ Total Loans • Specific Provision/Total Loans • Specific Provision/Loans under Follow-Up	• Personnel Expenses/Average Assets	• Net Profit/Average Assets • Net Profits/Average Shareholder's Equity • Interest Income/Total Operating Income • Non-Interest	• Liquid Assets/Total Assets • Total Loans/Total Deposits	• Trading Securities/ Total Assets • FX Assets/FX Liabilities • Net Interest Income/Average Assets

				Expenses/Total Operating Income		• Net on Balance Sheet Position/Total Shareholder's Equity
(W.-k. Wang, Lu, & Lin, 2012)	• Total Capital/Total Assets • Total Equity/Total Assets	• Annual Asset Growth Ratio • Gross Impaired Assets/Total Loans	• Overhead/Total Assets • Gross Impaired Assets/Total Loans	• Return on Equity (ROE) • Return on Assets (ROA)	• Total Loans/Total Assets • Liquid Assets/Total Assets • Total Loans/Total Deposits	
(Otchere, 2009)	• Capital Adequacy Ratio	• Loan Loss provisions/Total Loans • Impaired Assets/Total Loans • Net Impaired Assets/Total Loans	• Cost to Income Ratio • Expense to Asset Ratio	• Return on Assets (ROA) • Return on Equity (ROE) • Net Interest Margin (NIM)	Labour (Employment levels) Proxy used • Growth in Staff Levels	
(Maghyereh & Awartani, 2014)	• Tier 1 Capital/Risk Weighted Assets • Total Capital Ratio (Tier 1 + Tier 2 Capital/Risk Weighted Assets) • Equity/Total Assets	• Net Loans/Total Assets • Loan Loss Provisions/Total Loans • Non-Performing Loans/Total Loans	• DEA – Efficiency Score	• Net Interest margin (NIM) • ROAE (Return on Average Equity) • ROAA(Return on Average Assets)	• Interbank Ratio (Deposits due from banks/Deposits due to banks • Liquid Assets/Deposits & Short Term Funds	• Included Size as a Non-CAMEL Variable – Natural log of Total Assets

(Mekonnen, Kedir, & Shibru, 2015)	• Capital/Risk Weighted Assets	• Loan Loss provision/Total Assets	• Total Non-Interest Income/Total Non-Interest Expense	• Net Income After Tax & Provision/(Interest Income + Non-Interest Income)	• Liquid Assets/Total Deposits	
(Kobayashi, 2015)	• Capital Adequacy Ratio	• Disclosed Non-Performing Loans/Total Assets	• Return on Equity (ROE)	• Return on Assets (ROA)	• Cash + Due from Banks/Total Assets	• Control Variable – Size – Natural Log of Total Assets
(Wheelock, 2005)	• Total Equity/Total Assets	• Real Estate Loans/Total Loans • Commercial & Industrial Loans/Total Loans • Other Real Estate Owned/Total Assets • Income Earned, but not Collected on Loans/Total Assets		• Net Income after Taxes/Total Assets	• Total Loans/Total Assets • (Federal Funds Sold – Federal Funds Purchased)/Total Assets	• Miscellaneous factor: Size – Log of Total Assets
(Roman & Sargu, 2013)	• Total Capital Ratio • Equity/Total Assets	• Impaired Loans/Gross Loans • Loan Loss Provisions/Net Interest Revenues • Total Loans/Total Assets	• Operating Expenses/Total Assets • Interest Expenses/Deposits	• Return on Assets (ROA) • Return on Equity (ROE) • Cost to Income Ratio	• Liquid Assets/Deposits & Short Term Funding • Net Loans/Deposits & Short Term Funding	Size – Total Assets/Total Sector Assets
(Liu & Hung, 2006)	• Capital Adequacy Ratio	• Non-Performing Loans Ratio	• Employee Productivity Ratio		• Liquid Reserve Ratio	

(Oshinsky & Olin, 2006)	• Tangible Equity Capital • Capital Injections: From BHC Outside	• Past-Due Loans (30 – 89 days) • Past-Due Loans (90 + Days) • Nonaccrual Loans and Leases • Other Real Estate Owned • Allowance for Loan Loss	• Efficiency Ratio	• Total Interest Income • Total Non-Interest Income • Total Interest Expense • Loan-Loss Provision • Loan Charge-Offs • Expenses on Premises • Salaries • Other Non-Interest Expense	• Volatile Liabilities • Loans + Securities > Five Years	
(Ozkan-Gunay & Ozkan, 2007)	• Shareholders' Equity + Total Income/Deposit + Non-Deposit Funds • Net Working Capital/Total Assets • FX Position/Shareholders' Equity	• Non-Performing Loans/Total Loans • Permanent Assets/Total Assets • FX Assets/FX Liabilities		• Net Income/Average Total Assets • Net Income/Average Shareholders' Equity	• Liquid Assets/Total Assets • Liquid Assets/Deposit + Non-Deposit Funds • FX Liquid Assets/FX Liabilities	
(Dincer, Gencer, Orhan, & Sahinbas, 2011)	• Shareholder's Equity/ (Loan + Market + principle Amount Subject to Operational Risk)	• Financial Assets (net)/Total Assets • Total Loans and Receivables/Total Assets • Permanent	• Interest Expenses/Total Expenses • Interest Incomes/Total Incomes	• Net profit (losses)/Total Assets • Net Profit (Losses)/Total Shareholders'	• Liquid Assets/Total Assets • Liquid Assets/Short Term	• Total Assets/Sector Assets • Total Loans & Receivabl

	• Shareholder's Equity/Total Assets • Shareholder's Equity/(Deposit + Non-Deposit Sources)	Assets/Total Assets	• Total Incomes/Total Expenses	Equity	Liabilities • Liquid Assets/Deposit & Non Deposit Sources	es/Sector Loans and Receivables • Total Deposits/Sector Deposits
(Erol, Baklaci, Aydogan, & Tunc, 2014)	• Shareholders' Equity/Total Assets • On-balance Sheet FX Position/Shareholders' Equity	• Loans under Follow-Up (Net)/Total Loans and Receivables • Fixed Assets/Total Assets	• Loans under Follow-Up (Net)/Total Loans and Receivables • Other Operating Expenses/Total Assets	• Earnings Availability to Common Stockholders/Total Assets • Earnings availability to Common Stockholders/Total Equity • Income before Taxes/Total Assets • Total Income/Total Expense	• TC Liquid Assets/Total Assets • FX Liquid Assets/FX Liabilities	• On-balance-Sheet FX Position/Shareholders' Equity • FX Assets/FX liabilities
(Dunn, Intintoli, & McNutt, 2015)	• Tier 1 Risk-Based Capital Ratio	• Non-Performing Loans/Total Loans	• Efficiency Ratio	• Operating return/Average Total Assets	• Liquid Assets/Average Total Assets • Core Deposits/Average Total Assets	• Beta
(Muhmad & Hashim, 2015)	• Total Capital/Total Assets	• Non-performing Loans/Total Assets • Loan Loss	• Interest Expenses/Total Loans	• Net Interest Margin (NIM) • Net Interest	• Liquid Assets/Total Deposits	

	• Total Equity/Total Assets • Total Equity/Total Loans	Provision/Total Loans • Total Loans/Total Assets	• Operating Profit/Net Income • Personnel Expenses/Total Non-interest Expenses	Income/Total Assets • Interest Expenses/Total Assets	• Liquid Assets/Total Assets • Total Loans/Total Deposits	

Appendix 13: Regression Analysis Results (STATA Output)

Model 1 Fixed Effects Whole Period (2000 – 2013)

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. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression              Number of obs      =        364
Group variable: BankID                         Number of groups   =         76

R-sq:  within  = 0.3842                        Obs per group: min =          1
       between = 0.3987                                        avg =        4.8
       overall = 0.4927                                        max =         14

                                               F(8,280)           =      21.84
corr(u_i, Xb)  = 0.1169                         Prob > F           =     0.0000
```

DEAWBCC	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ETA	.6793619	.1278057	5.32	0.000	.4277799	.9309439
ILGL	.0354828	.0696301	0.51	0.611	-.1015821	.1725478
CIR	-.320012	.0674723	-4.74	0.000	-.4528294	-.1871946
NIM	-.3693838	.2716472	-1.36	0.175	-.9041138	.1653463
LADSTF	-.1519913	.040339	-3.77	0.000	-.2313976	-.072585
TSTA	-.2544979	.0767114	-3.32	0.001	-.4055022	-.1034936
SIZENLTA	5.419862	.9682359	5.60	0.000	3.513916	7.325808
GDP	.3183778	.3323953	0.96	0.339	-.3359332	.9726889
_cons	74.65133	9.468395	7.88	0.000	56.01306	93.28961

sigma_u	11.359155	
sigma_e	10.332778	
rho	.54721038	(fraction of variance due to u_i)

```
F test that all u_i=0:     F(75, 280) =     2.92            Prob > F = 0.0000
```

Model 1 Random Effects Whole Period (2000 – 2013)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression                  Number of obs      =        364
Group variable: BankID                         Number of groups   =         76

R-sq:  within  = 0.3794                        Obs per group: min =          1
       between = 0.4571                                        avg =        4.8
       overall = 0.5009                                        max =         14

                                               Wald chi2(8)       =     253.53
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =     0.0000
```

DEAWBCC	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.7683932	.1112514	6.91	0.000	.5503444	.9864419
ILGL	.0988578	.0597908	1.65	0.098	-.01833	.2160457
CIR	-.312632	.0599003	-5.22	0.000	-.4300344	-.1952296
NIM	-.2124282	.2157126	-0.98	0.325	-.6352171	.2103607
LADSTF	-.1591946	.035804	-4.45	0.000	-.2293691	-.0890201
TSTA	-.2451553	.0662336	-3.70	0.000	-.3749707	-.1153399
SIZENLTA	5.595221	.6966897	8.03	0.000	4.229734	6.960707
GDP	.0217872	.3180743	0.07	0.945	-.6016269	.6452013
_cons	72.50271	7.701389	9.41	0.000	57.40826	87.59715

sigma_u	7.7363221	
sigma_e	10.332778	
rho	.35921116	(fraction of variance due to u_i)

Model 1 Hausman-Test Whole Period (2000 – 2013)

```
. hausman FixedFEModel1 .

                 ──── Coefficients ────
                (b)           (B)            (b-B)       sqrt(diag(V_b-V_B))
             FixedFEMod~1  RandomREMo~1    Difference          S.E.

        ETA     .6793619      .7683932      -.0890313          .062908
       ILGL     .0354828      .0988578       -.063375         .0356849
        CIR     -.320012      -.312632        -.00738         .0310559
        NIM    -.3693838     -.2124282      -.1569556         .1651068
     LADSTF    -.1519913     -.1591946       .0072033         .0185826
       TSTA    -.2544979     -.2451553      -.0093426         .0387008
   SIZENLTA     5.419862      5.595221      -.1753588          .672387
        GDP     .3183778      .0217872       .2965907         .0965163

                       b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

      Test:  Ho:  difference in coefficients not systematic

                  chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        17.01
                Prob>chi2 =       0.0300
```

Model 1 Fixed Effects Pre-2005 Banking Reforms Period (2000 – 2004)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression            Number of obs      =        213
Group variable: BankID                       Number of groups   =         71

R-sq:  within  = 0.2526                       Obs per group: min =          1
       between = 0.1863                                      avg =        3.0
       overall = 0.2780                                      max =          5

                                             F(8,134)           =       5.66
corr(u_i, Xb)  = -0.0344                      Prob > F           =     0.0000

     DEAWBCC |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]

         ETA |   .7075548    .219427     3.22   0.002     .2735664    1.141543
        ILGL |   .1391857   .1071636     1.30   0.196    -.0727651    .3511366
         CIR |  -.3586149   .1014698    -3.53   0.001    -.5593046   -.1579253
         NIM |  -.4211286   .3419533    -1.23   0.220    -1.097453    .2551954
      LADSTF |  -.3793326   .0743945    -5.10   0.000    -.5264719   -.2321933
        TSTA |  -.1961705   .1175626    -1.67   0.098    -.4286888    .0363479
    SIZENLTA |   1.959702    3.99568     0.49   0.625    -5.943057    9.862461
         GDP |   .4198611   .4343411     0.97   0.335      -.43919    1.278912
       _cons |   102.7369   17.85821     5.75   0.000      67.4165    138.0573

     sigma_u |  13.394766
     sigma_e |  9.5979424
         rho |  .66074829   (fraction of variance due to u_i)

F test that all u_i=0:     F(70, 134) =     3.17            Prob > F = 0.0000
```

Model 1 Random Effects Pre-2005 Banking Reforms Period (2000 – 2004)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression                    Number of obs      =        213
Group variable: BankID                           Number of groups   =         71

R-sq:  within  = 0.2370                           Obs per group: min =          1
       between = 0.3100                                          avg =        3.0
       overall = 0.3443                                          max =          5

                                                  Wald chi2(8)       =      77.40
corr(u_i, X)  = 0 (assumed)                       Prob > chi2        =     0.0000
```

DEAWBCC	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.8718805	.1799381	4.85	0.000	.5192083	1.224553
ILGL	.2049168	.0822639	2.49	0.013	.0436825	.3661511
CIR	-.341746	.0813164	-4.20	0.000	-.5011232	-.1823688
NIM	-.3217775	.2589753	-1.24	0.214	-.8293598	.1858048
LADSTF	-.3297408	.0627114	-5.26	0.000	-.452653	-.2068287
TSTA	-.2233474	.0999226	-2.24	0.025	-.419192	-.0275028
SIZENLTA	6.301526	1.538882	4.09	0.000	3.285374	9.317679
GDP	.0459169	.3957548	0.12	0.908	-.7297481	.821582
_cons	81.06965	10.38175	7.81	0.000	60.72178	101.4175
sigma_u	10.215809					
sigma_e	9.5979424					
rho	.53115342	(fraction of variance due to u_i)				

.

Model 1 Hausman-Test Pre- 2005 Banking Reforms Period (2000 – 2004)

```
. hausman FEPreModel1 .
```

| | ——— Coefficients ——— | | | |
| | (b) | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
	FEPreModel1	REPreModel1	Difference	S.E.
ETA	.7075548	.8718805	-.1643257	.1255807
ILGL	.1391857	.2049168	-.0657311	.0686781
CIR	-.3586149	-.341746	-.0168689	.0606941
NIM	-.4211286	-.3217775	-.0993511	.2233021
LADSTF	-.3793326	-.3297408	-.0495918	.0400227
TSTA	-.1961705	-.2233474	.0271769	.0619391
SIZENLTA	1.959702	6.301526	-4.341824	3.687452
GDP	.4198611	.0459169	.3739442	.1789704

```
                   b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =         10.55
                Prob>chi2 =       0.2284
```

Model 1 Fixed Effects 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression              Number of obs     =        74
Group variable: BankID                         Number of groups  =        26

R-sq:  within  = 0.2381                         Obs per group: min =         1
       between = 0.2682                                        avg =       2.8
       overall = 0.1976                                        max =         4

                                                F(8,40)           =      1.56
corr(u_i, Xb)  = -0.1129                         Prob > F          =    0.1671
```

DEAWBCC	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ETA	.4500391	.3061616	1.47	0.149	-.1687365	1.068815
ILGL	-.1109631	.2714813	-0.41	0.685	-.6596472	.437721
CIR	-.4100226	.2686998	-1.53	0.135	-.9530852	.1330399
NIM	.8669124	1.642929	0.53	0.601	-2.453571	4.187396
LADSTF	-.1579673	.1450596	-1.09	0.283	-.4511437	.135209
TSTA	.0094922	.2004311	0.05	0.962	-.3955941	.4145785
SIZENLTA	1.978573	3.2186	0.61	0.542	-4.52646	8.483607
GDP	.7540805	3.560874	0.21	0.833	-6.442715	7.950876
_cons	89.79196	60.27772	1.49	0.144	-32.03385	211.6178
sigma_u	11.398662					
sigma_e	10.563964					
rho	.53795058	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(25, 40) =      1.58              Prob > F = 0.0950
```

Model 1 Random Effects 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression                  Number of obs     =        74
Group variable: BankID                         Number of groups  =        26

R-sq:  within  = 0.1753                         Obs per group: min =         1
       between = 0.7618                                        avg =       2.8
       overall = 0.4206                                        max =         4

                                                Wald chi2(8)      =     47.19
corr(u_i, X)   = 0 (assumed)                     Prob > chi2       =    0.0000
```

DEAWBCC	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.4868737	.2657954	1.83	0.067	-.0340756	1.007823
ILGL	-.0476982	.1267071	-0.38	0.707	-.2960396	.2006432
CIR	-.4802177	.1620126	-2.96	0.003	-.7977565	-.1626789
NIM	-.4886381	.8837116	-0.55	0.580	-2.220681	1.243405
LADSTF	-.1389736	.0980235	-1.42	0.156	-.3310961	.0531489
TSTA	-.1790884	.1442858	-1.24	0.215	-.4618834	.1037066
SIZENLTA	6.773419	1.893756	3.58	0.000	3.061725	10.48511
GDP	2.088509	3.542086	0.59	0.555	-4.853851	9.030869
_cons	65.50887	39.50865	1.66	0.097	-11.92667	142.9444
sigma_u	0					
sigma_e	10.563964					
rho	0	(fraction of variance due to u_i)				

.

Model 1 Hausman-Test 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. hausman FE2005ReformsModel1 .
```

	(b) FE2005Refo~1	—— Coefficients —— (B) RE2005Refo~1	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ETA	.4500391	.4868737	-.0368346	.1519465
ILGL	-.1109631	-.0476982	-.0632649	.2400987
CIR	-.4100226	-.4802177	.070195	.214363
NIM	.8669124	-.4886381	1.35555	1.385016
LADSTF	-.1579673	-.1389736	-.0189937	.1069284
TSTA	.0094922	-.1790884	.1885807	.1391194
SIZENLTA	1.978573	6.773419	-4.794846	2.602513
GDP	.7540805	2.088509	-1.334428	.365318

```
                    b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

               chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                       =       27.44
             Prob>chi2 =      0.0006
             (V_b-V_B is not positive definite)
```

Model 1 Fixed Effects 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe
```

Fixed-effects (within) regression	Number of obs	=	77
Group variable: BankID	Number of groups	=	18

R-sq: within = 0.2164	Obs per group: min =	1
between = 0.0204	avg =	4.3
overall = 0.0004	max =	5

	F(8,51)	=	1.76
corr(u_i, Xb) = -0.7826	Prob > F	=	0.1071

DEAWBCC	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
ETA	.0993344	.4816893	0.21	0.837	-.8676973	1.066366
ILGL	-.2000518	.1558023	-1.28	0.205	-.512838	.1127344
CIR	-.257172	.1531122	-1.68	0.099	-.5645576	.0502136
NIM	-.9435209	.8605285	-1.10	0.278	-2.671104	.7840621
LADSTF	-.1206314	.1144987	-1.05	0.297	-.3504971	.1092344
TSTA	-.5480561	.2303599	-2.38	0.021	-1.010523	-.0855894
SIZENLTA	-14.68028	8.865049	-1.66	0.104	-32.47761	3.117047
GDP	-1.135838	.7459502	-1.52	0.134	-2.633395	.3617198
_cons	234.6699	70.40995	3.33	0.002	93.31608	376.0238

sigma_u	14.507162	
sigma_e	8.7809162	
rho	.73186851	(fraction of variance due to u_i)

```
F test that all u_i=0:     F(17, 51) =      2.52               Prob > F = 0.0056
```

Model 1 Random Effects 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re
```

```
Random-effects GLS regression              Number of obs      =        77
Group variable: BankID                     Number of groups   =        18

R-sq:  within  = 0.1350                     Obs per group: min =         1
       between = 0.3560                                   avg =       4.3
       overall = 0.2849                                   max =         5

                                           Wald chi2(8)       =     16.98
corr(u_i, X)   = 0 (assumed)               Prob > chi2        =    0.0303
```

DEAWBCC	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.6947237	.3225832	2.15	0.031	.0624723	1.326975
ILGL	-.1213454	.1417583	-0.86	0.392	-.3991866	.1564958
CIR	-.2638647	.1173352	-2.25	0.025	-.4938375	-.0338919
NIM	-.2154229	.6854868	-0.31	0.753	-1.558952	1.128107
LADSTF	-.0054197	.0915589	-0.06	0.953	-.1848718	.1740324
TSTA	-.2561767	.1571319	-1.63	0.103	-.5641497	.0517962
SIZENLTA	2.244473	2.590449	0.87	0.386	-2.832714	7.32166
GDP	-.8218882	.6864072	-1.20	0.231	-2.167222	.5234452
_cons	94.74581	23.72349	3.99	0.000	48.24862	141.243

sigma_u	6.2339903					
sigma_e	8.7809162					
rho	.33511769	(fraction of variance due to u_i)				

```
.
```

Model 1 Hausman-Test 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. hausman FE2009Model1 .
```

	——— Coefficients ———			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FE2009Model1	RE2009Model1	Difference	S.E.
ETA	.0993344	.6947237	-.5953893	.3577216
ILGL	-.2000518	-.1213454	-.0787065	.0646447
CIR	-.257172	-.2638647	.0066927	.0983656
NIM	-.9435209	-.2154229	-.7280981	.5202087
LADSTF	-.1206314	-.0054197	-.1152117	.0687527
TSTA	-.5480561	-.2561767	-.2918794	.1684495
SIZENLTA	-14.68028	2.244473	-16.92475	8.478129
GDP	-1.135838	-.8218882	-.3139496	.2920392

```
                    b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =         8.39
                Prob>chi2 =      0.3962
                (V_b-V_B is not positive definite)
```

Model 2 Fixed Effects Whole Period (2000 – 2013)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression              Number of obs      =        361
Group variable: BankID                         Number of groups   =         76

R-sq:  within  = 0.4918                        Obs per group: min =          1
       between = 0.5305                                       avg =        4.8
       overall = 0.5812                                       max =         14

                                               F(8,277)           =      33.51
corr(u_i, Xb)  = -0.0251                        Prob > F           =     0.0000

─────────────────────────────────────────────────────────────────────────────
         ROA │      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
─────────────┼───────────────────────────────────────────────────────────────
         ETA │   .0070292   .0151031     0.47   0.642    -.0227022    .0367606
        ILGL │  -.0393854   .0082014    -4.80   0.000    -.0555303   -.0232405
         CIR │  -.0876312   .0078475   -11.17   0.000    -.1030795   -.0721829
         NIM │   .1367167   .0313956     4.35   0.000     .0749124    .1985209
      LADSTF │   .0143768     .00472     3.05   0.003     .0050852    .0236684
        TSTA │   .0030354   .0088931     0.34   0.733    -.0144713    .0205421
    SIZENLTA │  -.4171961   .1118301    -3.73   0.000     -.637341   -.1970512
         GDP │  -.0647164   .0389733    -1.66   0.098    -.1414379     .012005
       _cons │   9.151517   1.096791     8.34   0.000     6.992412    11.31062
─────────────┼───────────────────────────────────────────────────────────────
     sigma_u │  1.1494921
     sigma_e │  1.1931038
         rho │  .48138962   (fraction of variance due to u_i)
─────────────────────────────────────────────────────────────────────────────
F test that all u_i=0:     F(75, 277) =     2.42            Prob > F = 0.0000
```

Model 2 Random Effects Whole Period (2000 – 2013)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression                  Number of obs      =        361
Group variable: BankID                         Number of groups   =         76

R-sq:  within  = 0.4896                        Obs per group: min =          1
       between = 0.5506                                       avg =        4.8
       overall = 0.5875                                       max =         14

                                               Wald chi2(8)       =     372.02
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =     0.0000

─────────────────────────────────────────────────────────────────────────────
         ROA │      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
─────────────┼───────────────────────────────────────────────────────────────
         ETA │    .004076   .0128411     0.32   0.751     -.021092    .0292441
        ILGL │   -.034772   .0068553    -5.07   0.000    -.0482082   -.0213358
         CIR │  -.0906558   .0068303   -13.27   0.000     -.104043   -.0772686
         NIM │   .1278992   .0244054     5.24   0.000     .0800656    .1757329
      LADSTF │   .0143927   .0040978     3.51   0.000     .0063612    .0224243
        TSTA │    .007496   .0075264     1.00   0.319    -.0072555    .0222475
    SIZENLTA │  -.3534223    .078618    -4.50   0.000    -.5075107   -.1993339
         GDP │  -.0672932   .0366516    -1.84   0.066    -.1391289    .0045426
       _cons │   9.000937   .8744836    10.29   0.000      7.28698    10.71489
─────────────┼───────────────────────────────────────────────────────────────
     sigma_u │  .86528234
     sigma_e │  1.1931038
         rho │  .34467822   (fraction of variance due to u_i)
─────────────────────────────────────────────────────────────────────────────
```

Model 2 Hausman-Test Whole Period (2000 – 2013)

```
. hausman FixedModel2 .

                 ──── Coefficients ────
                  (b)          (B)           (b-B)       sqrt(diag(V_b-V_B))
             FixedModel2   RandomModel2    Difference           S.E.
   ─────────┼─────────────────────────────────────────────────────────────
       ETA  │   .0070292      .004076       .0029532          .0079504
      ILGL  │  -.0393854     -.034772      -.0046134          .0045019
       CIR  │  -.0876312     -.0906558      .0030246          .0038639
       NIM  │   .1367167      .1278992      .0088174           .01975
    LADSTF  │   .0143768      .0143927     -.0000159          .0023422
      TSTA  │   .0030354      .007496      -.0044606          .0047372
  SIZENLTA  │  -.4171961     -.3534223     -.0637738          .0795311
       GDP  │  -.0647164     -.0672932      .0025768          .0132507
   ─────────┴─────────────────────────────────────────────────────────────

                     b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

     Test:  Ho:  difference in coefficients not systematic

              chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        3.80
              Prob>chi2 =      0.8745
```

Model 2 Fixed Effects Pre-2005 Banking Reforms Period (2000 – 2004)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression            Number of obs      =        211
Group variable: BankID                       Number of groups   =         71

R-sq:  within  = 0.4868                      Obs per group: min =          1
       between = 0.3574                                      avg =        3.0
       overall = 0.4138                                      max =          5

                                             F(8,132)           =      15.65
corr(u_i, Xb)  = -0.4475                     Prob > F           =     0.0000

   ─────────┬────────────────────────────────────────────────────────────────
        ROA │     Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
   ─────────┼────────────────────────────────────────────────────────────────
       ETA  │  .0210053   .0311451     0.67   0.501    -.0406028    .0826134
      ILGL  │ -.0467786   .0146801    -3.19   0.002    -.0758173   -.0177399
       CIR  │ -.1046233   .013772     -7.60   0.000    -.1318658   -.0773809
       NIM  │  .1112449   .0454003     2.45   0.016     .0214385    .2010512
    LADSTF  │  .0163263   .0099022     1.65   0.102    -.0032612    .0359138
      TSTA  │  .0056431   .0156897     0.36   0.720    -.0253926    .0366788
  SIZENLTA  │ -1.488879   .5303043    -2.81   0.006    -2.537873   -.4398843
       GDP  │ -.0268486   .0579185    -0.46   0.644    -.1414171    .0877199
     _cons  │  13.98927   2.366028     5.91   0.000     9.309028    18.6695
   ─────────┼────────────────────────────────────────────────────────────────
   sigma_u  │ 1.7312438
   sigma_e  │ 1.2708119
       rho  │ .64984734   (fraction of variance due to u_i)
   ─────────┴────────────────────────────────────────────────────────────────
F test that all u_i=0:     F(70, 132) =      2.23            Prob > F = 0.0000
```

Model 2 Random Effects Pre-2005 Banking Reforms Period (2000 – 2004)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression              Number of obs     =        211
Group variable: BankID                     Number of groups  =         71

R-sq:  within  = 0.4656                     Obs per group: min =          1
       between = 0.5652                                    avg =        3.0
       overall = 0.5446                                    max =          5

                                           Wald chi2(8)      =     209.03
corr(u_i, X)  = 0 (assumed)                Prob > chi2       =     0.0000
```

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.0104015	.0226454	0.46	0.646	-.0339825	.0547856
ILGL	-.0303865	.0098341	-3.09	0.002	-.0496611	-.011112
CIR	-.1051483	.0097182	-10.82	0.000	-.1241955	-.086101
NIM	.1176386	.0299126	3.93	0.000	.0590109	.1762662
LADSTF	.0173577	.00763	2.27	0.023	.0024031	.0323123
TSTA	.0013948	.0121945	0.11	0.909	-.0225061	.0252957
SIZENLTA	-.3208737	.168278	-1.91	0.057	-.6506925	.0089451
GDP	-.0565274	.0519073	-1.09	0.276	-.1582638	.0452091
_cons	9.488972	1.230189	7.71	0.000	7.077845	11.9001

sigma_u	.83620162	
sigma_e	1.2708119	
rho	.3021495	(fraction of variance due to u_i)

.

Model 2 Hausman-Test Pre-2005 Banking Reforms Period (2000 -2004)

```
. hausman FEPreModel2 .
```

	——— Coefficients ———			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FEPreModel2	REPreModel2	Difference	S.E.
ETA	.0210053	.0104015	.0106038	.0213824
ILGL	-.0467786	-.0303865	-.0163921	.0108993
CIR	-.1046233	-.1051483	.0005249	.0097584
NIM	.1112449	.1176386	-.0063937	.034153
LADSTF	.0163263	.0173577	-.0010314	.0063116
TSTA	.0056431	.0013948	.0042483	.0098721
SIZENLTA	-1.488879	-.3208737	-1.168005	.5028968
GDP	-.0268486	-.0565274	.0296788	.025694

```
                  b = consistent under Ho and Ha; obtained from xtreg
          B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

             chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                     =        7.45
             Prob>chi2 =      0.4885
```

Model 2 Fixed Effects 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression              Number of obs      =        74
Group variable: BankID                         Number of groups   =        26

R-sq:  within  = 0.4918                         Obs per group: min =         1
       between = 0.6488                                        avg =       2.8
       overall = 0.6565                                        max =         4

                                                F(8,40)            =      4.84
corr(u_i, Xb)  = 0.2328                         Prob > F           =    0.0003
```

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ETA	.0275386	.0192531	1.43	0.160	-.0113733	.0664505
ILGL	-.011078	.0170722	-0.65	0.520	-.0455821	.0234262
CIR	-.0748115	.0168973	-4.43	0.000	-.1089622	-.0406608
NIM	.0958165	.1033161	0.93	0.359	-.1129932	.3046261
LADSTF	.0026019	.0091221	0.29	0.777	-.0158346	.0210384
TSTA	-.0094091	.0126042	-0.75	0.460	-.0348831	.0160649
SIZENLTA	-.2929243	.2024027	-1.45	0.156	-.7019954	.1161468
GDP	.2776125	.2239267	1.24	0.222	-.1749603	.7301852
_cons	5.522494	3.790583	1.46	0.153	-2.138561	13.18355

sigma_u	.97649422	
sigma_e	.6643182	
rho	.6836107	(fraction of variance due to u_i)

```
F test that all u_i=0:     F(25, 40) =     1.78           Prob > F = 0.0504
```

.

Model 2 Random Effects 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression                  Number of obs      =        74
Group variable: BankID                         Number of groups   =        26

R-sq:  within  = 0.4016                         Obs per group: min =         1
       between = 0.8899                                        avg =       2.8
       overall = 0.7873                                        max =         4

                                                Wald chi2(8)       =    233.28
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.0339613	.0171687	1.98	0.048	.0003112	.0676114
ILGL	-.0394424	.0082851	-4.76	0.000	-.0556809	-.0232039
CIR	-.07296	.0105497	-6.92	0.000	-.093637	-.0522831
NIM	.1899304	.0579934	3.28	0.001	.0762654	.3035953
LADSTF	.0112851	.006388	1.77	0.077	-.0012352	.0238055
TSTA	.0045121	.0093576	0.48	0.630	-.0138285	.0228527
SIZENLTA	.0615207	.1236224	0.50	0.619	-.1807748	.3038162
GDP	.1948125	.2279947	0.85	0.393	-.2520489	.6416738
_cons	2.644002	2.564935	1.03	0.303	-2.383179	7.671182

sigma_u	.09400265	
sigma_e	.6643182	
rho	.01962989	(fraction of variance due to u_i)

.

Model 2 Hausman-Test 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. hausman FE2005ReformsModel2 .

                ──── Coefficients ────
                  (b)          (B)          (b-B)      sqrt(diag(V_b-V_B))
              FE2005Refo~2 RE2005Refo~2   Difference          S.E.
─────────────────────────────────────────────────────────────────────────
       ETA     .0275386     .0339613     -.0064227          .0087129
      ILGL     -.011078    -.0394424      .0283644           .014927
       CIR    -.0748115      -.07296     -.0018515          .0131993
       NIM     .0958165     .1899304     -.0941139          .0855043
    LADSTF     .0026019     .0112851     -.0086832           .006512
      TSTA    -.0094091     .0045121     -.0139212          .0084439
   SIZENLTA   -.2929243     .0615207      -.354445          .1602634
       GDP     .2776125     .1948125         .0828              .
─────────────────────────────────────────────────────────────────────────
                      b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

              chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =       25.05
            Prob>chi2 =      0.0015
            (V_b-V_B is not positive definite)
```

Model 2 Fixed Effects 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression          Number of obs     =       76
Group variable: BankID                     Number of groups  =       18

R-sq:  within  = 0.2597                     Obs per group: min =        1
       between = 0.0561                                    avg =      4.2
       overall = 0.0003                                    max =        5

                                            F(8,50)           =     2.19
corr(u_i, Xb)  = -0.8179                     Prob > F          =   0.0438

─────────────────────────────────────────────────────────────────────────
       ROA  │    Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
─────────────┼───────────────────────────────────────────────────────────
       ETA  │  .0741466   .0740455     1.00   0.321    -.0745781    .2228712
      ILGL  │  .0001228   .0197575     0.01   0.995    -.0395613     .039807
       CIR  │ -.0413502    .020491    -2.02   0.049    -.0825077   -.0001927
       NIM  │  .1462632   .1089672     1.34   0.186    -.0726038    .3651302
    LADSTF  │  .0145546   .0150715     0.97   0.339    -.0157174    .0448266
      TSTA  │  .0275365   .0316994     0.87   0.389    -.0361336    .0912066
   SIZENLTA  │  3.138902   1.116286     2.81   0.007     .8967756    5.381029
       GDP  │  .0567113   .1024537     0.55   0.582     -.149073    .2624957
      _cons │ -19.96609   8.943326    -2.23   0.030    -37.92929   -2.002892
─────────────┼───────────────────────────────────────────────────────────
   sigma_u  │ 3.2316994
   sigma_e  │ 1.1054394
       rho  │ .89525038   (fraction of variance due to u_i)
─────────────────────────────────────────────────────────────────────────
F test that all u_i=0:     F(17, 50) =     2.30            Prob > F = 0.0116
```

Model 2 Random Effects 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re
```

```
Random-effects GLS regression              Number of obs     =         76
Group variable: BankID                     Number of groups  =         18

R-sq:  within  = 0.1247                     Obs per group: min =          1
       between = 0.7931                                    avg =        4.2
       overall = 0.5605                                    max =          5

                                           Wald chi2(8)      =      42.80
corr(u_i, X)  = 0 (assumed)                 Prob > chi2       =     0.0000
```

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	-.0142398	.0470054	-0.30	0.762	-.1063686	.0778891
ILGL	-.0027058	.0187184	-0.14	0.885	-.0393932	.0339816
CIR	-.0687367	.0154082	-4.46	0.000	-.0989362	-.0385372
NIM	.0754139	.0883148	0.85	0.393	-.0976799	.2485078
LADSTF	.0218216	.0118293	1.84	0.065	-.0013634	.0450067
TSTA	.0583249	.0201835	2.89	0.004	.0187659	.097884
SIZENLTA	-.1256043	.3267807	-0.38	0.701	-.7660828	.5148741
GDP	-.0116692	.0929203	-0.13	0.900	-.1937896	.1704513
_cons	4.538067	3.009514	1.51	0.132	-1.360472	10.43661
sigma_u	.73374092					
sigma_e	1.1054394					
rho	.30583067	(fraction of variance due to u_i)				

.

Model 2 Hausman-Test 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. hausman FE2009Model2 .
```

	——— Coefficients ———			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FE2009Model2	RE2009Model2	Difference	S.E.
ETA	.0741466	-.0142398	.0883863	.0572121
ILGL	.0001228	-.0027058	.0028286	.0063231
CIR	-.0413502	-.0687367	.0273865	.0135082
NIM	.1462632	.0754139	.0708493	.0638305
LADSTF	.0145546	.0218216	-.007267	.0093391
TSTA	.0275365	.0583249	-.0307884	.0244433
SIZENLTA	3.138902	-.1256043	3.264506	1.067384
GDP	.0567113	-.0116692	.0683805	.0431576

```
                    b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =         11.79
                Prob>chi2 =      0.1609
                (V_b-V_B is not positive definite)
```

Model 3 Fixed Effects Whole Period (2000 – 2013)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression              Number of obs      =       364
Group variable: BankID                         Number of groups   =        76

R-sq:  within  = 0.1854                         Obs per group: min =         1
       between = 0.0720                                        avg =       4.8
       overall = 0.1602                                        max =        14

                                               F(7,281)           =      9.13
corr(u_i, Xb)  = -0.0677                        Prob > F           =    0.0000
```

ZScore	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ILGL	-.0122739	.010637	-1.15	0.250	-.0332122	.0086643
CIR	-.0503317	.0102361	-4.92	0.000	-.0704809	-.0301825
NIM	.1627404	.0401787	4.05	0.000	.0836509	.2418299
LADSTF	.0071273	.0061401	1.16	0.247	-.0049591	.0192136
TSTA	.0115297	.0117892	0.98	0.329	-.0116767	.0347361
SIZENLTA	.2992459	.1465872	2.04	0.042	.0106976	.5877942
GDP	.1775406	.0494664	3.59	0.000	.0801689	.2749123
_cons	3.655123	1.455104	2.51	0.013	.7908353	6.51941

sigma_u	1.822277	
sigma_e	1.5916277	
rho	.56725473	(fraction of variance due to u_i)

```
F test that all u_i=0:      F(75, 281) =     3.22             Prob > F = 0.0000
```


Model 3 Random Effects Whole Period (2000 – 2013)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression                  Number of obs      =       364
Group variable: BankID                         Number of groups   =        76

R-sq:  within  = 0.1670                         Obs per group: min =         1
       between = 0.2225                                        avg =       4.8
       overall = 0.2433                                        max =        14

                                               Wald chi2(7)       =     82.71
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

ZScore	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ILGL	-.0142409	.0092515	-1.54	0.124	-.0323736	.0038918
CIR	-.0571877	.009172	-6.24	0.000	-.0751644	-.0392109
NIM	.1407639	.0327218	4.30	0.000	.0766304	.2048974
LADSTF	-.0008498	.0055125	-0.15	0.877	-.0116541	.0099544
TSTA	.0110157	.0102959	1.07	0.285	-.0091638	.0311952
SIZENLTA	-.0630499	.1087441	-0.58	0.562	-.2761844	.1500847
GDP	.1560915	.0482774	3.23	0.001	.0614695	.2507134
_cons	6.754265	1.180479	5.72	0.000	4.44057	9.067961

sigma_u	1.2118132	
sigma_e	1.5916277	
rho	.36696042	(fraction of variance due to u_i)

Model 3 Hausman-Test Whole Period (2000 – 2013)

```
. hausman FE1 .

                 ———— Coefficients ————
              |    (b)          (B)           (b-B)      sqrt(diag(V_b-V_B))
              |    FE1          RE1         Difference         S.E.
--------------+----------------------------------------------------------------
        ILGL  |  -.0122739    -.0142409      .0019669         .0052492
         CIR  |  -.0503317    -.0571877      .006856          .0045445
         NIM  |   .1627404     .1407639      .0219765         .0233156
      LADSTF  |   .0071273    -.0008498      .0079771         .0027042
        TSTA  |   .0115297     .0110157      .000514          .0057429
     SIZENLTA |   .2992459    -.0630499      .3622958         .0982981
         GDP  |   .1775406     .1560915      .0214491         .0107804

                          b = consistent under Ho and Ha; obtained from xtreg
             B = inconsistent under Ha, efficient under Ho; obtained from xtreg

       Test:  Ho:  difference in coefficients not systematic

                     chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                           =       22.82
                   Prob>chi2 =      0.0018
```

Model 3 Fixed Effects Pre-2005 Banking Reforms Period (2000 – 2004)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression          Number of obs      =        212
Group variable: BankID                     Number of groups   =         71

R-sq:  within  = 0.2241                     Obs per group: min =          1
       between = 0.4041                                    avg =        3.0
       overall = 0.3769                                    max =          5

                                            F(7,134)           =       5.53
corr(u_i, Xb)  = 0.0571                      Prob > F           =     0.0000

------------------------------------------------------------------------------
      ZScore |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
        ILGL |   -.014257   .0140246    -1.02   0.311    -.0419952    .0134811
         CIR |  -.0127947   .0129261    -0.99   0.324    -.0383603     .012771
         NIM |   .2087306   .0408959     5.10   0.000     .1278457    .2896155
      LADSTF |   .0214022   .0094204     2.27   0.025     .0027703    .0400341
        TSTA |   .0017831   .0150453     0.12   0.906    -.0279739    .0315401
     SIZENLTA| -.9238919    .5099852    -1.81   0.072    -1.932554    .0847699
         GDP |   .0887176   .0547897     1.62   0.108     -.019647    .1970821
       _cons |   5.407689   2.286069     2.37   0.019     .8862418    9.929136
-------------+----------------------------------------------------------------
     sigma_u |  1.5446997
     sigma_e |  1.2284088
         rho |   .61259174   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0:     F(70, 134) =     2.99            Prob > F = 0.0000
```

Model 3 Random Effects Pre-2005 Banking Reforms Period (2000 – 2004)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression              Number of obs      =       212
Group variable: BankID                     Number of groups   =        71

R-sq:  within  = 0.1944                     Obs per group: min =         1
       between = 0.5108                                    avg =       3.0
       overall = 0.4588                                    max =         5

                                           Wald chi2(7)       =    106.15
corr(u_i, X)   = 0 (assumed)               Prob > chi2        =    0.0000
```

ZScore	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ILGL	-.014999	.0103336	-1.45	0.147	-.0352526	.0052545
CIR	-.0389238	.0101603	-3.83	0.000	-.0588376	-.01901
NIM	.1583687	.0307353	5.15	0.000	.0981287	.2186087
LADSTF	.0185444	.0078278	2.37	0.018	.0032021	.0338867
TSTA	-.0081968	.0125612	-0.65	0.514	-.0328164	.0164227
SIZENLTA	-1.1319	.1703324	-6.65	0.000	-1.465746	-.798055
GDP	.1201503	.0497224	2.42	0.016	.0226962	.2176045
_cons	8.44099	1.229373	6.87	0.000	6.031463	10.85052

sigma_u	1.1116405	
sigma_e	1.2284088	
rho	.45022398	(fraction of variance due to u_i)

Model 3 Hausman-Test Pre-2005 Banking Reforms Period (2000 – 2004)

	── Coefficients ──			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FE1	RE1	Difference	S.E.
ILGL	-.014257	-.014999	.000742	.0094818
CIR	-.0127947	-.0389238	.0261291	.0079909
NIM	.2087306	.1583687	.0503619	.026978
LADSTF	.0214022	.0185444	.0028578	.005241
TSTA	.0017831	-.0081968	.00998	.0082811
SIZENLTA	-.9238919	-1.1319	.2080083	.4806992
GDP	.0887176	.1201503	-.0314327	.0230129

```
                    b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

   Test:  Ho:  difference in coefficients not systematic

                 chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                         =        13.61
              Prob>chi2 =       0.0587
```

Model 3 Fixed Effects 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression              Number of obs     =        74
Group variable: BankID                         Number of groups  =        26

R-sq:  within  = 0.1771                         Obs per group: min =         1
       between = 0.1226                                        avg =       2.8
       overall = 0.1291                                        max =         4

                                                F(7,41)           =      1.26
corr(u_i, Xb)  = -0.1990                         Prob > F          =    0.2935
```

ZScore	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ILGL	-.0818485	.042933	-1.91	0.064	-.1685534	.0048565
CIR	-.017827	.0442021	-0.40	0.689	-.107095	.0714409
NIM	-.2136722	.2675922	-0.80	0.429	-.7540856	.3267412
LADSTF	-.0205024	.0236308	-0.87	0.391	-.0682259	.027221
TSTA	-.016593	.0329079	-0.50	0.617	-.0830518	.0498658
SIZENLTA	-1.093624	.5055687	-2.16	0.036	-2.114641	-.0726075
GDP	-.9963381	.5605918	-1.78	0.083	-2.128476	.1357999
_cons	26.64045	9.110694	2.92	0.006	8.241032	45.03987

sigma_u	2.0852564	
sigma_e	1.7381419	
rho	.59004474	(fraction of variance due to u_i)

```
F test that all u_i=0:     F(25, 41) =      1.07            Prob > F = 0.4155
```

Model 3 Random Effects 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression                  Number of obs     =        74
Group variable: BankID                         Number of groups  =        26

R-sq:  within  = 0.0582                         Obs per group: min =         1
       between = 0.7381                                        avg =       2.8
       overall = 0.5492                                        max =         4

                                                Wald chi2(7)      =     78.90
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =    0.0000
```

ZScore	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ILGL	-.0301423	.0190365	-1.58	0.113	-.0674532	.0071687
CIR	-.0742703	.0236171	-3.14	0.002	-.120559	-.0279815
NIM	.3059684	.130307	2.35	0.019	.0505713	.5613655
LADSTF	.0063516	.014805	0.43	0.668	-.0226656	.0353689
TSTA	.0442497	.0211017	2.10	0.036	.002891	.0856083
SIZENLTA	-.878364	.2636202	-3.33	0.001	-1.39505	-.3616779
GDP	-.7508095	.5231722	-1.44	0.151	-1.776208	.2745891
_cons	18.9703	5.517951	3.44	0.001	8.155312	29.78528

sigma_u	.14472078	
sigma_e	1.7381419	
rho	.00688479	(fraction of variance due to u_i)

Model 3 Hausman-Test 2005 Banking Reforms & GFC Period (2005 – 2008)

```
. hausman FE1 .

                 ──── Coefficients ────
                  (b)          (B)          (b-B)       sqrt(diag(V_b-V_B))
                  FE1          RE1         Difference          S.E.

       ILGL    -.0818485    -.0301423     -.0517062         .0384819
        CIR     -.017827    -.0742703      .0564432         .0373638
        NIM    -.2136722     .3059684     -.5196406         .2337213
     LADSTF    -.0205024     .0063516      -.026854         .0184182
       TSTA     -.016593     .0442497     -.0608427         .0252516
   SIZENLTA    -1.093624     -.878364     -.2152601         .4313978
        GDP    -.9963381    -.7508095     -.2455286         .2013803

                        b = consistent under Ho and Ha; obtained from xtreg
           B = inconsistent under Ha, efficient under Ho; obtained from xtreg

     Test:  Ho:  difference in coefficients not systematic

                  chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          13.78
                Prob>chi2 =         0.0553
```

Model 3 2009 Fixed Effects Banking Reforms & Post-GFC Period (2009 – 2013)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression              Number of obs      =        78
Group variable: BankID                         Number of groups   =        19

R-sq:  within  = 0.5730                         Obs per group: min =         1
       between = 0.0040                                        avg =       4.1
       overall = 0.0738                                        max =         5

                                               F(7,52)            =      9.97
corr(u_i, Xb)  = -0.8150                        Prob > F           =    0.0000


       ZScore        Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]

         ILGL     .0018299    .0183786     0.10   0.921    -.0350495     .0387093
          CIR    -.0290979    .0177193    -1.64   0.107    -.0646542     .0064584
          NIM     .1028567    .1013595     1.01   0.315    -.1005359     .3062493
       LADSTF    -.0011145     .013424    -0.08   0.934    -.0280519     .0258228
         TSTA     .0024412    .0270226     0.09   0.928    -.0517837     .0566662
     SIZENLTA      -3.5892    .7984493    -4.50   0.000    -5.191406    -1.986995
          GDP      .105335     .085796     1.23   0.225    -.0668273     .2774974
        _cons     29.15004    6.221762     4.69   0.000     16.66516     41.63492

      sigma_u    3.6281628
      sigma_e     1.03647
          rho    .92454822   (fraction of variance due to u_i)

F test that all u_i=0:     F(18, 52) =      6.50            Prob > F = 0.0000
```

Model 3 Random Effects 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re
```

```
Random-effects GLS regression              Number of obs      =         78
Group variable: BankID                     Number of groups   =         19

R-sq:  within  = 0.4318                    Obs per group: min =          1
       between = 0.2983                                   avg =        4.1
       overall = 0.3326                                   max =          5

                                           Wald chi2(7)       =      47.02
corr(u_i, X)   = 0 (assumed)               Prob > chi2        =     0.0000
```

ZScore	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ILGL	-.0118456	.0188096	-0.63	0.529	-.0487117	.0250205
CIR	-.0474244	.0168476	-2.81	0.005	-.0804452	-.0144037
NIM	.2509151	.096816	2.59	0.010	.0611593	.440671
LADSTF	.0064762	.0135115	0.48	0.632	-.0200058	.0329583
TSTA	.0097538	.0242049	0.40	0.687	-.0376869	.0571945
SIZENLTA	-.7176028	.4365846	-1.64	0.100	-1.573293	.1380873
GDP	.2552415	.0872061	2.93	0.003	.0843208	.4261623
_cons	8.865865	3.832134	2.31	0.021	1.355021	16.37671

sigma_u	1.1903361	
sigma_e	1.03647	
rho	.56876887	(fraction of variance due to u_i)

Model 3 Hausman-Test 2009 Banking Reforms & Post-GFC Period (2009 – 2013)

```
. hausman FE1 .
```

	—— Coefficients ——			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FE1	RE1	Difference	S.E.
ILGL	.0018299	-.0118456	.0136755	.
CIR	-.0290979	-.0474244	.0183265	.0054891
NIM	.1028567	.2509151	-.1480584	.0300067
LADSTF	-.0011145	.0064762	-.0075908	.
TSTA	.0024412	.0097538	-.0073125	.0120144
SIZENLTA	-3.5892	-.7176028	-2.871598	.6685171
GDP	.105335	.2552415	-.1499065	.

```
                    b = consistent under Ho and Ha; obtained from xtreg
         B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =        33.22
               Prob>chi2 =       0.0000
               (V_b-V_B is not positive definite)
```

Variance Inflation Factor (VIF) Model 1 & Model 2

Whole Period (2000 – 2013)

Variable	VIF	1/VIF
SIZENLTA	1.60	0.623464
LADSTF	1.42	0.705785
ILGL	1.34	0.745860
NIM	1.28	0.782503
CIR	1.23	0.815715
GDP	1.18	0.849310
TSTA	1.16	0.862205
ETA	1.14	0.877779
Mean VIF	1.29	

Pre-2005 Banking Reforms Period (2000 – 2004)

```
. vif
```

Variable	VIF	1/VIF
ETA	1.63	0.614294
SIZENLTA	1.53	0.653186
NIM	1.23	0.815760
TSTA	1.19	0.841463
CIR	1.17	0.852965
ILGL	1.17	0.855466
LADSTF	1.14	0.876270
GDP	1.12	0.893250
Mean VIF	1.27	

2005 Banking Reforms & GFC Period (2005 – 2008)

```
. vif
```

Variable	VIF	1/VIF
SIZENLTA	2.01	0.496625
ETA	1.91	0.524079
NIM	1.78	0.562328
CIR	1.69	0.592282
ILGL	1.39	0.717512
TSTA	1.23	0.813460
GDP	1.19	0.839396
LADSTF	1.05	0.951892
Mean VIF	1.53	

2009 Banking Reforms & Post-GFC Period (2009 – 2013)

Variable	VIF	1/VIF
GDP	2.10	0.477269
ETA	1.68	0.595422
TSTA	1.63	0.612323
ILGL	1.62	0.618739
LADSTF	1.49	0.672027
CIR	1.37	0.728915
SIZENLTA	1.29	0.776783
NIM	1.11	0.899041
Mean VIF	1.54	

Variance Inflation Factor (VIF) Model 3

Whole Period (2000 – 2013)

Variable	VIF	1/VIF
SIZENLTA	1.59	0.630757
LADSTF	1.38	0.722851
ILGL	1.33	0.754091
NIM	1.25	0.799592
CIR	1.17	0.856407
TSTA	1.15	0.866666
GDP	1.14	0.876008
Mean VIF	1.29	

Pre-2005 Banking Reforms Period (2000 – 2004)

Variable	VIF	1/VIF
TSTA	1.18	0.846642
ILGL	1.17	0.856395
NIM	1.16	0.863172
CIR	1.14	0.874297
LADSTF	1.14	0.876540
SIZENLTA	1.09	0.918477
GDP	1.08	0.928704
Mean VIF	1.14	

2005 Banking Reforms & GFC Period (2005 – 2008)

Variable	VIF	1/VIF
SIZENLTA	1.70	0.586543
NIM	1.68	0.594086
CIR	1.57	0.636588
ILGL	1.38	0.727199
TSTA	1.16	0.865053
GDP	1.15	0.870194
LADSTF	1.05	0.952518
Mean VIF	1.38	

2009 Banking Reforms & Post-GFC Period (2009 – 2013)

Variable	VIF	1/VIF
GDP	1.83	0.547273
ILGL	1.70	0.589042
TSTA	1.59	0.628575
LADSTF	1.47	0.682268
CIR	1.36	0.734604
SIZENLTA	1.36	0.736465
NIM	1.07	0.931050
Mean VIF	1.48	

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Appendix 14: Model Extension Regression Results

Extension Model 4 Fixed Effects

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP DUM1 DUM2, fe

Fixed-effects (within) regression              Number of obs     =        364
Group variable: BankID                         Number of groups  =         76

R-sq:                                          Obs per group:
     within  = 0.4056                                        min =          1
     between = 0.3996                                        avg =        4.8
     overall = 0.4904                                        max =         14

                                               F(10,278)         =      18.97
corr(u_i, Xb)  = 0.1025                         Prob > F          =     0.0000
```

DEAWBCC	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ETA	.5854406	.137104	4.27	0.000	.3155468	.8553345
ILGL	.0336174	.0688376	0.49	0.626	-.1018918	.1691266
CIR	-.3185632	.0672587	-4.74	0.000	-.4509642	-.1861622
NIM	-.2522492	.2743995	-0.92	0.359	-.792414	.2879156
LADSTF	-.2321002	.0491908	-4.72	0.000	-.3289339	-.1352664
TSTA	-.2634961	.0759454	-3.47	0.001	-.4129973	-.1139949
SIZENLTA	5.004084	1.373848	3.64	0.000	2.299617	7.70855
GDP	.2240118	.3329389	0.67	0.502	-.4313898	.8794134
DUM1	4.121203	2.728411	1.51	0.132	-1.249766	9.492173
DUM2	-3.179111	3.906147	-0.81	0.416	-10.8685	4.510273
_cons	82.85949	10.20613	8.12	0.000	62.76838	102.9506

```
     sigma_u |  11.346322
     sigma_e |   10.18811
         rho |  .55362906   (fraction of variance due to u_i)

F test that all u_i=0: F(75, 278) = 3.08              Prob > F = 0.0000
```

Extension Model 4 Random Effects

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP DUM1 DUM2, re

Random-effects GLS regression                  Number of obs     =        364
Group variable: BankID                         Number of groups  =         76

R-sq:                                          Obs per group:
     within  = 0.4007                                        min =          1
     between = 0.4492                                        avg =        4.8
     overall = 0.5007                                        max =         14

                                               Wald chi2(10)     =     266.01
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

DEAWBCC	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.709265	.1248043	5.68	0.000	.4646531	.9538768
ILGL	.0899301	.0594784	1.51	0.131	-.0266455	.2065056
CIR	-.3140275	.0597964	-5.25	0.000	-.4312262	-.1968288
NIM	-.158621	.2187505	-0.73	0.468	-.5873642	.2701222
LADSTF	-.2243172	.0439003	-5.11	0.000	-.3103602	-.1382741
TSTA	-.2436148	.0659573	-3.69	0.000	-.3728886	-.1143409
SIZENLTA	5.336766	1.0048	5.31	0.000	3.367393	7.306139
GDP	-.0892677	.3220628	-0.28	0.782	-.7204992	.5419637
DUM1	3.297087	2.509637	1.31	0.189	-1.621711	8.215885
DUM2	-3.339273	3.498616	-0.95	0.340	-10.19643	3.517888
_cons	79.43233	8.249794	9.63	0.000	63.26304	95.60163

```
     sigma_u |  7.7597838
     sigma_e |   10.18811
         rho |  .36713355   (fraction of variance due to u_i)
```

Extension Model 4 Hausman-Test

. hausman BCCF1 .

```
                  ——— Coefficients ———
                 (b)          (B)           (b-B)      sqrt(diag(V_b-V_B))
                BCCF1        BCCR1         Difference          S.E.
```

	(b) BCCF1	(B) BCCR1	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ETA	.5854406	.709265	-.1238243	.0567574
ILGL	.0336174	.0899301	-.0563127	.0346545
CIR	-.3185632	-.3140275	-.0045357	.0307917
NIM	-.2522492	-.158621	-.0936282	.1656602
LADSTF	-.2321002	-.2243172	-.007783	.0221922
TSTA	-.2634961	-.2436148	-.0198813	.0376477
SIZENLTA	5.004084	5.336766	-.3326822	.9369284
GDP	.2240118	-.0892677	.3132795	.0844031
DUM1	4.121203	3.297087	.8241163	1.07049
DUM2	-3.179111	-3.339273	.1601617	1.737145

```
                           b = consistent under Ho and Ha; obtained from xtreg
              B = inconsistent under Ha, efficient under Ho; obtained from xtreg

      Test:  Ho:  difference in coefficients not systematic

                    chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                             =        25.46
                  Prob>chi2 =       0.0045
```

Extension Model 5 Fixed Effects

. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP DUM1 DUM2, fe

```
Fixed-effects (within) regression          Number of obs      =        361
Group variable: BankID                     Number of groups   =         76

R-sq:                                      Obs per group:
    within  = 0.5005                                     min =          1
    between = 0.5147                                     avg =        4.8
    overall = 0.5845                                     max =         14

                                           F(10,275)          =      27.56
corr(u_i, Xb)  = 0.0463                     Prob > F           =     0.0000
```

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ETA	.0164196	.0164082	1.00	0.318	-.015882	.0487212
ILGL	-.0382266	.0081779	-4.67	0.000	-.0543259	-.0221273
CIR	-.0850018	.0079027	-10.76	0.000	-.1005593	-.0694442
NIM	.1277031	.0319977	3.99	0.000	.0647116	.1906945
LADSTF	.0092172	.0057855	1.59	0.112	-.0021723	.0206067
TSTA	.004516	.0088877	0.51	0.612	-.0129805	.0220125
SIZENLTA	-.1848908	.1605599	-1.15	0.251	-.5009734	.1311919
GDP	-.0794127	.0393914	-2.02	0.045	-.1569598	-.0018656
DUM1	-.4995517	.3193063	-1.56	0.119	-1.128147	.1290436
DUM2	-1.002195	.4577851	-2.19	0.029	-1.903404	-.100987
_cons	8.522203	1.195376	7.13	0.000	6.168952	10.87545

sigma_u	1.1615844
sigma_e	1.1871314
rho	.48912428 (fraction of variance due to u_i)

F test that all u_i=0: F(75, 275) = 2.46   Prob > F = 0.0000

Extension Model 5 Random Effects

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP DUM1 DUM2, re
```

Random-effects GLS regression	Number of obs	=	361
Group variable: BankID	Number of groups	=	76

R-sq:		Obs per group:		
within = 0.4983		min =	1
between = 0.5372		avg =	4.8
overall = 0.5903		max =	14

		Wald chi2(10)	=	377.07
corr(u_i, X) = 0 (assumed)		Prob > chi2	=	0.0000

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.0145861	.014594	1.00	0.318	-.0140176	.0431898
ILGL	-.0342618	.006859	-5.00	0.000	-.0477052	-.0208185
CIR	-.0891692	.0068661	-12.99	0.000	-.1026265	-.075712
NIM	.1207781	.0248953	4.85	0.000	.0719842	.169572
LADSTF	.0101201	.0050337	2.01	0.044	.0002541	.019986
TSTA	.0089055	.0075491	1.18	0.238	-.0058904	.0237015
SIZENLTA	-.2108086	.1145761	-1.84	0.066	-.4353736	.0137565
GDP	-.0818743	.0374252	-2.19	0.029	-.1552262	-.0085223
DUM1	-.3861712	.2887989	-1.34	0.181	-.9522068	.1798643
DUM2	-.7647671	.4027736	-1.90	0.058	-1.554189	.0246547
_cons	8.733161	.943547	9.26	0.000	6.883843	10.58248

sigma_u	.86484737	
sigma_e	1.1871314	
rho	.34672094	(fraction of variance due to u_i)

Extension Model 5 Hausman-Test

```
. hausman ROAF2 .
```

	—— Coefficients ——			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	ROAF2	ROAR2	Difference	S.E.
ETA	.0164196	.0145861	.0018335	.0074996
ILGL	-.0382266	-.0342618	-.0039648	.0044534
CIR	-.0850018	-.0891692	.0041675	.0039129
NIM	.1277031	.1207781	.006925	.0201016
LADSTF	.0092172	.0101201	-.0009029	.002852
TSTA	.004516	.0089055	-.0043895	.0046906
SIZENLTA	-.1848908	-.2108086	.0259178	.1124802
GDP	-.0794127	-.0818743	.0024615	.0122899
DUM1	-.4995517	-.3861712	-.1133805	.1362046
DUM2	-1.002195	-.7647671	-.2374283	.2175789

```
             b = consistent under Ho and Ha; obtained from xtreg
        B = inconsistent under Ha, efficient under Ho; obtained from xtreg

   Test:  Ho:  difference in coefficients not systematic

             chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                      =        5.45
             Prob>chi2 =      0.8592
```

Extension Model 6 Fixed Effects

. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP DUM1 DUM2, fe

```
Fixed-effects (within) regression              Number of obs      =        364
Group variable: BankID                         Number of groups   =         76

R-sq:                                          Obs per group:
     within  = 0.2889                                       min =          1
     between = 0.3869                                       avg =        4.8
     overall = 0.3925                                       max =         14

                                               F(9,279)           =      12.59
corr(u_i, Xb)  = 0.1418                         Prob > F           =     0.0000
```

ZScore	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ILGL	-.0164988	.0100186	-1.65	0.101	-.0362204	.0032227
CIR	-.0536653	.0096719	-5.55	0.000	-.0727045	-.034626
NIM	.2017043	.0381811	5.28	0.000	.1265447	.276864
LADSTF	.0020006	.0071926	0.28	0.781	-.012158	.0161593
TSTA	.0041344	.01112	0.37	0.710	-.0177554	.0260241
SIZENLTA	-.4609717	.1976738	-2.33	0.020	-.8500932	-.0718502
GDP	.1601101	.047055	3.40	0.001	.0674822	.252738
DUM1	2.283274	.3671856	6.22	0.000	1.560468	3.00608
DUM2	1.85244	.5494644	3.37	0.001	.7708175	2.934062
_cons	7.0341	1.463822	4.81	0.000	4.152563	9.915638
sigma_u	1.4629574					
sigma_e	1.4924116					
rho	.49003463	(fraction of variance due to u_i)				

F test that all u_i=0: F(75, 279) = 2.19   Prob > F = 0.0000

Extension Model 6 Random Effects

. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP DUM1 DUM2, re

```
Random-effects GLS regression                  Number of obs      =        364
Group variable: BankID                         Number of groups   =         76

R-sq:                                          Obs per group:
     within  = 0.2721                                       min =          1
     between = 0.5480                                       avg =        4.8
     overall = 0.4407                                       max =         14

                                               Wald chi2(9)       =     206.06
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =     0.0000
```

ZScore	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ILGL	-.0211127	.0082342	-2.56	0.010	-.0372514	-.0049741
CIR	-.0608499	.0081455	-7.47	0.000	-.0768147	-.0448851
NIM	.1701593	.028604	5.95	0.000	.1140966	.2262221
LADSTF	.0053545	.0061555	0.87	0.384	-.0067101	.0174191
TSTA	.0025095	.009227	0.27	0.786	-.0155752	.0205941
SIZENLTA	-.9249543	.1239854	-7.46	0.000	-1.167961	-.6819473
GDP	.1511895	.0455378	3.32	0.001	.061937	.2404421
DUM1	2.986574	.3135593	9.52	0.000	2.372009	3.601139
DUM2	3.129705	.452193	6.92	0.000	2.243423	4.015987
_cons	9.50604	1.067859	8.90	0.000	7.413075	11.59901
sigma_u	.77370671					
sigma_e	1.4924116					
rho	.21183304	(fraction of variance due to u_i)				

Extension Model 6 Hausman-Test

```
. hausman ZscoreF3 .
```

| | —— Coefficients —— | | | |
| | (b) | (B) | (b-B) | sqrt(diag(V_b-V_B)) |
	ZscoreF3	ZscoreR3	Difference	S.E.
ILGL	-.0164988	-.0211127	.0046139	.005707
CIR	-.0536653	-.0608499	.0071846	.0052152
NIM	.2017043	.1701593	.031545	.0252905
LADSTF	.0020006	.0053545	-.0033539	.0037206
TSTA	.0041344	.0025095	.0016249	.0062062
SIZENLTA	-.4609717	-.9249543	.4639825	.1539563
GDP	.1601101	.1511895	.0089206	.0118524
DUM1	2.283274	2.986574	-.7033006	.1910648
DUM2	1.85244	3.129705	-1.277265	.3121419

```
                        b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                chi2(9) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =         22.63
                Prob>chi2 =        0.0071
```

Extension Model 7 Fixed Effects Lagged Whole Period (2000 – 2013)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression          Number of obs     =        173
Group variable: BankID                     Number of groups  =         66

R-sq:                                      Obs per group:
    within  = 0.0994                                      min =          1
    between = 0.0240                                      avg =        2.6
    overall = 0.0000                                      max =          5

                                           F(8,99)           =       1.37
corr(u_i, Xb)  = -0.5032                    Prob > F          =     0.2212
```

DEAWBCC	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ETA	.4488691	.2461095	1.82	0.071	-.0394656	.9372038
ILGL	-.2340869	.140845	-1.66	0.100	-.5135539	.04538
CIR	.0944822	.1585316	0.60	0.553	-.2200789	.4090434
NIM	-.3973887	.5191754	-0.77	0.446	-1.427545	.6327679
LADSTF	-.1218164	.0992424	-1.23	0.223	-.318735	.0751021
TSTA	-.1405102	.1726336	-0.81	0.418	-.4830528	.2020324
SIZENLTA	-5.715153	5.299865	-1.08	0.283	-16.23124	4.800929
GDP	.5481511	.5321167	1.03	0.305	-.5076838	1.603986
_cons	93.46961	27.81073	3.36	0.001	38.28708	148.6521

sigma_u	18.161616	
sigma_e	10.967101	
rho	.73278931	(fraction of variance due to u_i)

```
F test that all u_i=0: F(65, 99) = 3.01                       Prob > F = 0.0000
```

Extension Model 7 Random Effects Lagged Whole Period (2000 – 2013)

```
. xtreg DEAWBCC ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re

Random-effects GLS regression              Number of obs     =        173
Group variable: BankID                     Number of groups  =         66

R-sq:                                      Obs per group:
    within  = 0.0343                                    min =          1
    between = 0.2105                                    avg =        2.6
    overall = 0.1715                                    max =          5

                                           Wald chi2(8)      =      19.05
corr(u_i, X)   = 0 (assumed)               Prob > chi2       =     0.0146
```

DEAWBCC	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.5497936	.1898168	2.90	0.004	.1777595	.9218277
ILGL	-.0260894	.1033713	-0.25	0.801	-.2286935	.1765146
CIR	-.0892016	.1154753	-0.77	0.440	-.315529	.1371257
NIM	-.1857345	.3349493	-0.55	0.579	-.842223	.470754
LADSTF	-.0980504	.0782217	-1.25	0.210	-.2513621	.0552612
TSTA	-.3449944	.1318076	-2.62	0.009	-.6033326	-.0866562
SIZENLTA	4.741855	1.72438	2.75	0.006	1.362132	8.121579
GDP	-.043774	.4867693	-0.09	0.928	-.9978242	.9102762
_cons	62.44921	13.69073	4.56	0.000	35.61587	89.28255

sigma_u	10.025331	
sigma_e	10.967101	
rho	.45522772	(fraction of variance due to u_i)

Extension Model 7 Hausman-Test Lagged Whole Period (2000 – 2013)

```
. hausman FEMBCCL1 .
```

	——— Coefficients ———			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FEMBCCL1	REMBCCL1	Difference	S.E.
ETA	.4488691	.5497936	-.1009245	.1566508
ILGL	-.2340869	-.0260894	-.2079975	.0956643
CIR	.0944822	-.0892016	.1836839	.1086174
NIM	-.3973887	-.1857345	-.2116542	.3966763
LADSTF	-.1218164	-.0980504	-.023766	.0610773
TSTA	-.1405102	-.3449944	.2044842	.111486
SIZENLTA	-5.715153	4.741855	-10.45701	5.011495
GDP	.5481511	-.043774	.591925	.2149508

```
                b = consistent under Ho and Ha; obtained from xtreg
         B = inconsistent under Ha, efficient under Ho; obtained from xtreg

   Test:  Ho:  difference in coefficients not systematic

            chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =        35.69
            Prob>chi2 =      0.0000
```

Extension Model 8 Fixed Effects Lagged Whole Period (2000 – 2013)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe
```

```
Fixed-effects (within) regression              Number of obs     =         171
Group variable: BankID                         Number of groups  =          65

R-sq:                                          Obs per group:
    within  = 0.1661                                         min =           1
    between = 0.1918                                         avg =         2.6
    overall = 0.2109                                         max =           5

                                               F(8,98)           =        2.44
corr(u_i, Xb)  = -0.1366                        Prob > F          =      0.0188
```

ROA	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ETA	.0555053	.0344983	1.61	0.111	-.0129555	.1239661
ILGL	-.0193648	.0200138	-0.97	0.336	-.0590815	.0203518
CIR	-.0702619	.0222287	-3.16	0.002	-.114374	-.0261498
NIM	-.0748812	.0732973	-1.02	0.309	-.2203372	.0705749
LADSTF	-.000061	.0140945	-0.00	0.997	-.0280311	.0279091
TSTA	-.0281321	.0246521	-1.14	0.257	-.0770533	.0207891
SIZENLTA	-.8112397	.7427803	-1.09	0.277	-2.285263	.6627837
GDP	-.0087542	.0752955	-0.12	0.908	-.1581757	.1406674
_cons	12.0856	3.91628	3.09	0.003	4.313867	19.85733

sigma_u	2.0377447	
sigma_e	1.5370401	
rho	.63737066	(fraction of variance due to u_i)

```
F test that all u_i=0: F(64, 98) = 2.16                       Prob > F = 0.0003
```

.

Extension Model 8 Random Effects Lagged Whole Period (2000 – 2013)

```
. xtreg ROA ETA ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re
```

```
Random-effects GLS regression                  Number of obs     =         171
Group variable: BankID                         Number of groups  =          65

R-sq:                                          Obs per group:
    within  = 0.1376                                         min =           1
    between = 0.4420                                         avg =         2.6
    overall = 0.3998                                         max =           5

                                               Wald chi2(8)      =       62.94
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =      0.0000
```

ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ETA	.075935	.025226	3.01	0.003	.0264929	.1253771
ILGL	-.0043918	.0136143	-0.32	0.747	-.0310753	.0222917
CIR	-.0811452	.0150835	-5.38	0.000	-.1107084	-.051582
NIM	.0376941	.043595	0.86	0.387	-.0477505	.1231387
LADSTF	.0061797	.010541	0.59	0.558	-.0144802	.0268397
TSTA	-.0266594	.0176843	-1.51	0.132	-.0613201	.0080012
SIZENLTA	.0176089	.2228921	0.08	0.937	-.4192517	.4544694
GDP	-.0920381	.0660348	-1.39	0.163	-.2214639	.0373878
_cons	7.936109	1.793722	4.42	0.000	4.420478	11.45174

sigma_u	1.2064896	
sigma_e	1.5370401	
rho	.3812403	(fraction of variance due to u_i)

Extension Model 8 Hausman-Test Lagged Whole Period (2000 – 2013)

```
. hausman FEMROA1 .

                ──── Coefficients ────
               (b)           (B)           (b-B)      sqrt(diag(V_b-V_B))
             FEMROA1       REMROA1       Difference          S.E.
    ─────────────────────────────────────────────────────────────────────
        ETA    .0555053      .075935      -.0204297         .0235326
       ILGL   -.0193648    -.0043918       -.014973         .0146698
        CIR   -.0702619    -.0811452       .0108833          .016328
        NIM   -.0748812     .0376941      -.1125753         .0589234
     LADSTF    -.000061     .0061797      -.0062408         .0093564
       TSTA   -.0281321    -.0266594      -.0014726         .0171752
   SIZENLTA   -.8112397     .0176089      -.8288485         .708549
        GDP   -.0087542    -.0920381       .0832839         .0361777
    ─────────────────────────────────────────────────────────────────────

                       b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

      Test:  Ho:  difference in coefficients not systematic

                    chi2(8) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                            =       16.48
                  Prob>chi2 =      0.0360
```

Extension Model 9 Fixed Effects Lagged Whole Period (2000 – 2013)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, fe

Fixed-effects (within) regression            Number of obs      =        172
Group variable: BankID                       Number of groups   =         66

R-sq:                                        Obs per group:
     within  = 0.2250                                    min =          1
     between = 0.0127                                    avg =        2.6
     overall = 0.0027                                    max =          5

                                             F(7,99)            =       4.11
corr(u_i, Xb)  = -0.4327                      Prob > F           =     0.0005

    ─────────────────────────────────────────────────────────────────────
      ZScore        Coef.   Std. Err.       t    P>|t|     [95% Conf. Interval]
    ─────────────────────────────────────────────────────────────────────
        ILGL    -.0517266    .0149921    -3.45   0.001    -.0814742    -.0219791
         CIR     .0090723     .016374     0.55   0.581    -.0234173     .0415619
         NIM     .0339383    .0546469     0.62   0.536    -.0744931     .1423696
      LADSTF      .017797    .0103107     1.73   0.087    -.0026616     .0382557
        TSTA     .0127086    .0184005     0.69   0.491    -.0238019     .0492192
    SIZENLTA     .1757892     .548035     0.32   0.749    -.9116311      1.26321
         GDP     .1822222    .0564718     3.23   0.002     .0701698     .2942746
       _cons     1.375225    2.887686     0.48   0.635     -4.35457      7.10502
    ─────────────────────────────────────────────────────────────────────
     sigma_u    2.5803424
     sigma_e    1.1529693
         rho    .83357279   (fraction of variance due to u_i)
    ─────────────────────────────────────────────────────────────────────
F test that all u_i=0: F(65, 99) = 4.54                    Prob > F = 0.0000
```

Extension Model 9 Random Effects Lagged Whole Period (2000 – 2013)

```
. xtreg ZScore ILGL CIR NIM LADSTF TSTA SIZENLTA GDP, re
```

```
Random-effects GLS regression                   Number of obs     =        172
Group variable: BankID                          Number of groups  =         66

R-sq:                                           Obs per group:
    within  = 0.1427                                        min =          1
    between = 0.2881                                        avg =        2.6
    overall = 0.3232                                        max =          5

                                                Wald chi2(7)      =      43.07
corr(u_i, X)   = 0 (assumed)                    Prob > chi2       =     0.0000
```

ZScore	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
ILGL	-.0404108	.0124823	-3.24	0.001	-.0648756	-.015946
CIR	-.0237135	.0139334	-1.70	0.089	-.0510225	.0035955
NIM	.0351769	.0420225	0.84	0.403	-.0471856	.1175395
LADSTF	.0080049	.0092612	0.86	0.387	-.0101466	.0261565
TSTA	-.0013255	.0157981	-0.08	0.933	-.0322893	.0296383
SIZENLTA	-.968107	.23003	-4.21	0.000	-1.418958	-.5172565
GDP	.213851	.0533389	4.01	0.000	.1093087	.3183932
_cons	8.650198	1.661659	5.21	0.000	5.393405	11.90699

sigma_u	1.6372268	
sigma_e	1.1529693	
rho	.66848181	(fraction of variance due to u_i)

Extension Model 9 Hausman-Test Lagged Whole Period (2000 – 2013)

```
. hausman FEMZscore1 .
```

	—— Coefficients ——			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	FEMZscore1	REMZscore1	Difference	S.E.
ILGL	-.0517266	-.0404108	-.0113159	.008304
CIR	.0090723	-.0237135	.0327858	.0086005
NIM	.0339383	.0351769	-.0012387	.0349342
LADSTF	.017797	.0080049	.0097921	.0045322
TSTA	.0127086	-.0013255	.0140341	.0094338
SIZENLTA	.1757892	-.968107	1.143896	.4974219
GDP	.1822222	.213851	-.0316288	.0185482

```
                 b = consistent under Ho and Ha; obtained from xtreg
         B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                 chi2(7) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                         =         19.91
               Prob>chi2 =       0.0058
               (V_b-V_B is not positive definite)
```