Volume 16 Issue 8
Originally issued as D1

Global Journal of Management and Business Research: D
Accounting and Auditing
Volume 16 Issue 1 Version 1.0 Year 2016
Type: Double Blind Peer Reviewed International Research Journal
Publisher: Global Journals Inc. (USA)
Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Capital Base and Operational Efficiency in Nigerian Deposit Money Banks (Evidence from a Two-Way Fixed Effect Approach)

By Olarewaju, Odunayo Magret

Ekiti State University, Nigeria

Abstract- This paper evaluated the influence of capital base of banks on the level of operational efficiency of banks in Nigeria for the period 2004- 2013, with a view to providing information on financial ratio analysis as a measure of banks' operational efficiency and how adequate is the capital adequacy of banks' policy to significantly spur the level of their operational efficiency. Secondary data extracted from annual report and accounts of the fifteen purposively selected quoted banks were employed. Data were analysed using measures of central tendency and two-way fixed effect regression technique. Findings from the analysis showed that debt to total equity ($t = -3.17$, $p < 0.05$), core capital ratio ($t = 4.65$, $p < 0.05$), bank risk ($t = -3.89$, $p < 0.05$) were significant in evaluating the influence of capital adequacy on operational efficiency of the Nigerian money deposit banks.

Keywords: *capital adequacy, core capital, two-way fixed effect, operational efficiency, deposit money banks.*

GJMBR - D Classification : *JEL Code : G21*



Strictly as per the compliance and regulations of:

© 2016. Olarewaju, Odunayo Magre. This is a research/review paper, distributed under the terms of the Creative Commons Attribution-Noncommercial 3.0 Unported License http://creativecommons.org/licenses/by-nc/3.0/), permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Capital Base and Operational Efficiency in Nigerian Deposit Money Banks (Evidence from a Two-Way Fixed Effect Approach)

Olarewaju, Odunayo Magret

Abstract- This paper evaluated the influence of capital base of banks on the level of operational efficiency of banks in Nigeria for the period 2004- 2013, with a view to providing information on financial ratio analysis as a measure of banks' operational efficiency and how adequate is the capital adequacy of banks' policy to significantly spur the level of their operational efficiency. Secondary data extracted from annual report and accounts of the fifteen purposively selected quoted banks were employed. Data were analysed using measures of central tendency and two-way fixed effect regression technique. Findings from the analysis showed that debt to total equity ($t = -3.17$, $p< 0.05$), core capital ratio ($t = 4.65$, $p< 0.05$), bank risk ($t = -3.89$, $p< 0.05$) were significant in evaluating the influence of capital adequacy on operational efficiency of the Nigerian money deposit banks. Banks like FCMB ($t = 2.63$, $p< 0.05$), Fidelity Bank ($t = 2.23$, $p< 0.05$) and WEMA Bank ($t = 2.45$, $p< 0.05$), had heterogeneous operational efficiency in the year 2009 ($t= 3.06$, $p< 0.05$) and year 2010 ($t = 3.63$, $p< 0.05$) due to their intrinsic organizational factors such as managerial competence, technological acceptance and timeliness of decision making, towards sustaining operational efficiency.

Keywords: capital adequacy, core capital, two-way fixed effect, operational efficiency, deposit money banks.

I. Introduction

While efficiency ratio or asset utilization ratio generally measures the efficiency of management in the use of the assets at its disposal, operational efficiency specifically measures how efficiently firm's product has been produced, held and distributed. Kolapo (2006) posited that a firm that is not operationally efficient will not achieve satisfactory return on owners' equity and later finds it difficult to survive adverse economic conditions. Like other firms, banks are not charitable organizations and are out to maximize shareholders wealth by transforming inputs into financial products and services at a lower cost relative to revenue generated from operation. The concept of operational efficiency is crucial for bank survival especially when one view banks as service organizations with overhead constituting the most significant overhead. It is evident that banks generate significant proportion of their income through interest received on disbursed loans and customers' deposits constitute the larger source of this lending, hence, the need to be adequately capitalised is paramount. If an operationally efficient bank requires to be adequately capitalised, it is necessary to critically evaluate the influence of bank's capital adequacy on their operational efficiency. The banking systems of many developing economies have exhibited poor performance, perhaps, in part, due to excessive government regulations and unfavourable business environment. To address this problem, various financial liberalizations, reforms and restructuring programs have been implemented in an effort to foster banking efficiency and a better allocation of resources (Isik & Hassan, 2003). The impact of these measures on bank efficiency has been widely studied with approximately 95% of these works focusing on banks of industrialized countries. However, only a limited number of these studies have examined the impact of capital adequacy on banks operational efficiency in developing economies (Kwan, 2003).

Studies on the importance of operating efficiency for banks in other economies revealed that the key determinants of operational efficiency were affected by the global financial crisis (Siraj & Pillai, 2011). This reinforces the need to understand the drivers of operational efficiency for proper risk management in the Nigerian Deposit Money Banks. The high interest charged by Nigerian banks could be attributed to the inability to push their operational costs downwards despite the increase in capital base of Nigerian banks. This may be due to many challenges in respect of costs and management of risks which banks are exposed to. Operating efficiency is one of the most critical risks faced by financial institutions in the Nigerian environment. For the banking institution to make the best use of their capital base, it is paramount for the sector to operate efficiently.

From happenings in the banking sector, it is evident that some banks were able to meet the 2005 re-capitalisation of ₦25b but still failed in 2009. Could this be a signal that some of the capitals raised by banks on the stock exchange were fictitious as earlier raised by Sanusi (2010)? Surprisingly, few years after the much publicised consolidation in Nigeria, some of these banks that merged together or absorbed other smaller banks to meet up with the ₦25b requirement were later declared distress in 2009. However, some of the banks

Author: Department of Accounting Ekiti State University, Ado-Ekiti.
e-mail: olarewaju_odunayo@yahoo.com

© 2016 Global Journals Inc. (US)

which were able to withstand the re-capitalisation exercise of 2005 without absorbing or merging with other banks are still sound up till date and they are not failing. Could it be that, those few banks that stood alone throughout these hurdles are operating efficiently without any distress because of their broad and adequate capital base?

From the empirical literature, it is worthy of note that not many studies have examined the relationship between capital adequacy and operational efficiency of banks in Nigeria. However, some researchers in developed and other developing economies have examined the impact of bank capital adequacy on operational efficiency and they found out that well-capitalised banks are better run with low unit cost; thereby operating efficiently. Some of these studies include: Berger and Young (1997) in the United State of America; Kwan and Eisenbeis (1997) in Turkey; Ncube (2009) in South Africa; Dhanapal and Ganesan (2012) in India; Abusharba, Triyuwono, Ismail and Rahuman (2013) in Indonesian; Odunga, Nyangweso, Carter and Mwarumbva (2013) in Kenya; Odunga, Nyangweso and Nkobe (2013) in Kenya.

With the aforementioned problems in Nigerian banking sector and with the available literature, it is evident that there is the need to dig deep into the capital base of banks in order to know the relationship between capital adequacy and operational efficiency.

Thus, this paper is aimed at critically examining banks' capital adequacy and operational efficiency in Nigeria.

a) Objectives of the Study

a. To examine the effect of capital adequacy on banks' operational efficiency in Nigeria
b. To measure banks operational efficiency using the accounting approach (that is, Financial Ratio Analysis)

b) Hypothesis of the Study

Ho: Capital base does not significantly influence the operational efficiency in Nigerian deposit money banks.

The paper is structured into six (6) sub-sections. Next sub-section captures the review of related literatures, followed by the methodology, the fourth sub-section focused on the data analysis and discussion of findings, conclusions and recommendations of relevant policies is captured by the fifth sub-section while, limitation of the study and suggested areas for further study is captured by the last subsection.

II. Review of Related Liteatures

a) Conceptual Review

i. *Meaning of Banks' Capital Adequacy*

According to Reserve Bank of New Zealand (2004), capital adequacy is a measure of the amount of a bank's capital expressed as a percentage of its risk weighted credit exposures. An international standard which recommends minimum capital adequacy ratio has been developed to ensure that banks can absorb a reasonable level of losses before becoming insolvent. Applying minimum capital adequacy ratios serves as a protection of depositors. It also promotes the stability and efficiency of financial system by reducing the likelihood of banks becoming insolvent. When a bank becomes insolvent, this may lead to a loss of confidence in the financial system, causing financial problems for other banks and perhaps threatening the smooth functioning of financial markets.

ii. *Meaning of Operational Efficiency of Banks*

Deposit Money Banks play an important role as financial intermediaries for savers and borrowers in an economy. All sectors depend on banking sector for their very survival and growth. Operational efficiency of banks is, therefore, essential for a well-functioning economy. Operational efficiency is simply defined as the ability to deliver products and service cost effectively without sacrificing quality. Shawk (2008) defined operational efficiency as what occurs when a right combination of people, process and technology come together to enhance the productivity and value of any business operation, while driving down the cost of routine operations to a desired level.

According to Beck *et al.* (2000), Efficiency in intermediation of funds from savers to borrowers enables allocation of resources to their most productive users. The more efficient a financial system is in resource generation and in its allocation, the greater its contribution to productivity and economic growth. According to Chen (2001), Efficiency in banking has been tactically defined and studied in different dimensions including: (i) Scale efficiency (ii) Scope efficiency and (iii) Operational efficiency, a wide concept sometimes referred to as x-efficiency. Scale and Scope economies, for example, are achieved from the firms' output expansion resulting in an increase in the industry's output and reduction in the costs of production thus leading to the strong technological external economy. A bank has the scale efficiency, when it operates within the range of constant return to scale. Scope efficiency comes into play when the bank operates in different numerous locations. But the main area of interest in this study, which is operational efficiency, refers to the efficient utilization of human and material resources or the efficient use of people, machine tools and materials funds. Better utilization of any or a combination of these three, can increase output of goods and services and reduce costs. Operational efficiency is the tactical planning of an organization to maintain a safe balance between cost and productivity. It identifies the wasteful processes that contribute to loss of resources and organizational profits. It deals with minimizing waste and maximizing the benefits of

© 2016 Global Journals Inc. (US)

resource to provide better services to the customers. For effective competition, lowering costs is the best option as internal wastage enhances more cost. Any input that is not processed through a system so as to generate useful output is a waste. It means producing more goods and rendering services with no greater use of resources to commensurate with income generated from the production or services.

iii. *Measures that can Improve Operational Efficiency of Banks*

According to Dhanapal and Ganesan (2012), the following measures will improve the operational efficiency of banks if strictly adhered to.

a. *Innovative product designing:* It is needed to suit the needs of the customers and to have sustainable growth. Examples are: Loans to Small and Medium Enterprises (SMEs) to build more entrepreneurs for boosting the economy, Super Savings accounts, Zero base accounts, Automated Teller Machine (ATM), Cards tie up with other banks, Mobile banking and National Electronic Fund Transfer system of fund transfers etc.

b. *Development of new technology:* Banks have to interact constantly with other industries, trade associations, farming communities, academic/ research institutions etc, so as to initiate studies and pilot projects for evolving better financial models in their banks. For example, solar powered ATM technology save costs.

c. Engaging in the insurance business is catching up. Financial Institutions have started entering insurance business of which banks are not exempted. From mere offering of insurance products through network of bank branches, the business is likely to expand through self-designed insurance products after necessary legislative changes.

d. Reducing overstaffing and introducing other measures for improving revenue generation. This strategy would increase the productivity of the banks. A bank does not need to create irrelevant branches that will increase the number of staff and thereby jack up their operating cost.

e. Corporate Governance: Good corporate governance would bring financial stability and reduces high profile breakdowns. The transparency of the banks' operation is emphasized by the corporate governance. Following the Good Governance Practices is essential for building public confidence and faithful reporting.

© 2016 Global Journals Inc. (US)

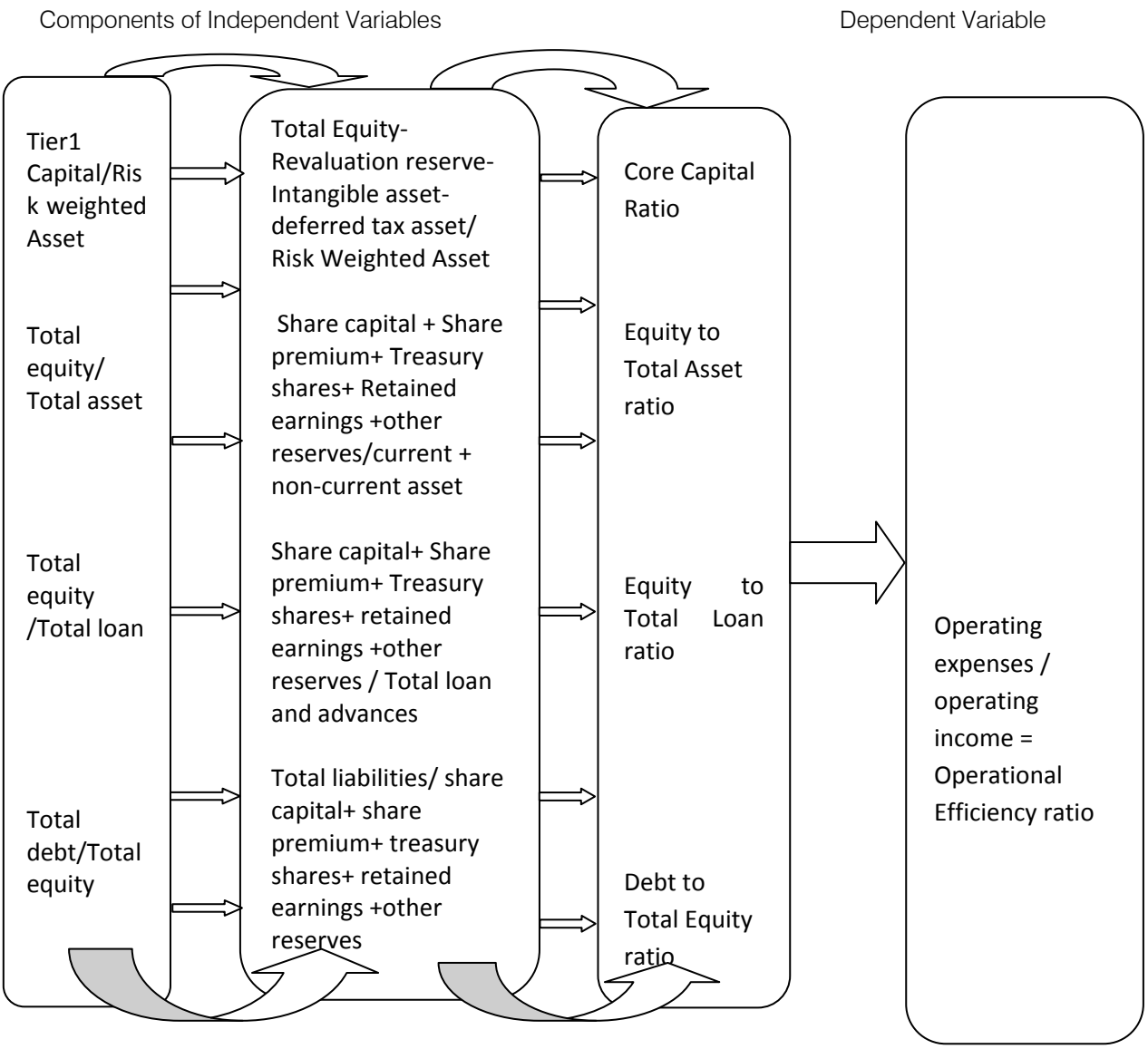

Figure 2.1 : Conceptual Framework on Banks' Capitalization and Operational Efficiency

Source: Olarewaju (2015)

In the figure above, there are four independent variables affecting the operational efficiency of banks. The ratio of tier 1 capital to risk weighted asset (Core Capital Ratio), total equity to total asset (Equity to Total Asset ratio), total equity to total Loan (Equity to Total Loan ratio) and total liabilities to total equity (Debt to Total Equity ratio), all denote the capital adequacy of banks which is expected to exert a positive influence on banks operational efficiency since capital adequacy serves as a cushion against unexpected loss or fluctuation in operation. Following the study of Djalilov and Piesse (2006), some banks in Central Asian countries are inefficient due to low capital adequacy, low profitability and poor asset quality.

Bank Risk ratio which is a control variable in this paper is measured as the ratio of total liability to total asset ratio will add a greater depth in understanding the risks a bank takes when trying to obtain higher returns at lower cost. If the bank's management takes very little risk, the bank would not be very efficient. Hence, the management should balance the trade-off between safety and operational efficiency and afterwards, a positive relationship is predicted between Bank Risk and operational efficiency.

b) Theoretical Underpinning

i. *The Regulatory and Efficient Market-Monitoring Hypothesis*

This was first introduced by Fama (1965; 1970) and it states that regulators encourage banks to increase their capital to measure up with the amount of risk taken by banks. This may be achieved through efficient market monitoring mechanisms that will call for increase in capital when capital positions are deemed inadequate.

© 2016 Global Journals Inc. (US)

Thus, an important factor contributing to a positive relationship between capital adequacy and banks efficiency relates to the behaviours of regulators and supervisors. Banks could respond to regulatory actions forcing them to increase their capital by increasing asset risk (Kim & Santomero, 1988). The need to control the high incidence of loan default occasioned by increased lending activities was a popular motive for reforms in financial systems in developing economies. Harley (2011), stated that government should regulate investment policy for banks for them to be more efficient and be globally competitive.

c) *Empirical Review on Capital Adequacy and Operational Efficiency of Banks*

Considerable research has been concluded in recent years on the issue of whether the private market place or government regulatory agencies exert a bigger effect on bank risk taken and on bank capital decisions. However, government regulation appears to have become important with the tightening of capital regulations and the imposition of minimum capital requirements.

The financial markets do seem to react to the differential risk positions of banks by downgrading the debt and equity securities offered by riskier banking sector.

However, as Eisenbeis and Gilbert (1985) noted, 'we are not at all sure whether markets discipline works well for small and medium – sized banks, whose securities are not as actively traded in open market nor is it clear that the risk premium imposed by the market on lower-quality bank securities (in the form of lower price and higher interest rates) are really large enough to discipline bank taking'. Also, while the market may make efficient use of all the information it possesses, some of the most pertinent information needed to assess a bank's true level of risk exposure is hidden from the market and is known only to bank examiners.

Is a bank's capital–to-assets ratio significantly related to its probability of failure? Most research studies find little connection between capital ratios and the incidence of bank failure. For example, Santemero and Vinso (1977) found that increased capital does not materially lower a bank's failure risk. Many banks would still fail even if their capital were doubled or tripled - a conclusion backed up by a recent study in New England by Peek and Rosengren (1997) which found that four-fifths of bank's failing in the 1980s and early 1990s were classified by examiners as 'well capitalized'' before they failed. It is by no means certain that imposing higher capital requirements will reduce banking risk. As Wall (1989) observed, banks faced with tougher capital standards may take on more risk in other aspect of their operations in order to keep from earning lower returns.

Apart from its many roles and functions, banks capital acts as protective cushion against losses precipitation by certain kinds of uncertainties. This view looks at capital as a constraint to avoid default and it also acts as a cushion to protect depositors and other creditors against loss at both the operating and liquidation stage.

Graham (1985) emphasizes that, if depositors are going to grow, capital must grow alongside. He affirmed that management disciplines have an effect on capital. In this view, capital constraint helps to avoid over-trading and curbs malpractice by management. Gardener (1989) is of the opinion that prudential guidelines of capital adequacy system have an important effect on bank capital profitability and efficiency.

While mandatory capital ratios help to set a corresponding profit target for banks, capital adequacy might influence banks cost of capital and its overall cost of fund. Ceteris paribus, higher capital adequacy ratios may restrict the competitive abilities of banks. Apart from this, they also affect banks growth capabilities. This view takes into consideration the effect mandatory capital ratios have on banks performance being that if the banks are not able to meet up with the mandatory capital ratio, it places a constraint on their lending abilities which eventually affects their primary aim of money creation.

Oluyemi (1996), stated that capital plays a significant role in the banking sectors of an economy. The need for adequacy capital for banks is a pressing problem not only in Nigeria but also to a very large extent in many countries especially in developing economies.

Ayodele (1998), for instance suggested, that over the period 1952-1975 in the banking industry, a relatively large number of banks that failed were due to under capitalization. However, Bank of International Settlement (B I S) emphasized that, capital is one of a number of factors to be weighted in assessing the strength and efficiency of banks. Familoni (2000) however, defines banks capital as the equity value of its future net earnings. This implies that capital is the total asset less total liabilities. He also stressed that capital is required in sufficient quantity to enable banks perform its functions efficiently and to maintain public confidence.

Sharma, Raina and Singh (2012) employed panel data through stochastic frontier analysis model to measure the source of technical efficiency of Indian banking sector. The major determinant of technical efficiency as revealed by the study are fixed asset, deposit and deposit to total liabilities while, the cash deposit ratio is not insignificant. In a study on the determinants of operating efficiency in Egypt banking sector, Armar, Mustapha and Eldomiaty (2011) found

© 2016 Global Journals Inc. (US)

asset quality, capital adequacy, credit risk and liquidity as the main determinants of efficiency in the highly competitive banks.

Using non parametric approach of measuring efficiency by focusing on total factor productivity in the measurement of the determinant of efficiency in the central Asian banks between 2003-2006, Djahlilor and Piesse revealed that majority of the banking organizations are efficient and that the inefficiency observed in some of the central Asian banks are traceable to low capital adequacy, poor asset quality and low profitability.

Employing Data Envelopment Analysis, it is evident that the main sources of efficiency in Nigerian banking sector is market size and the banking sector is not efficient in the pre and post liberalization period because of the distribution in the financial system. (Obafemi, Ayodele & Ebong, 2013). There is a negative relationship between bank efficiency and profitability (Oke & Polodmine, 2012) .Islamic banking group are more efficient in resources allocation while, commercial banks are technically efficient. Like in Nigeria, Abrahim and Abdulmajid (2011) identified size or scale of operation as an important determinant of bank efficiency in Maylasian banking sector (see also Adewoye & Omoriege, 2013). In Mexico, Garza- Garcia (2009) using Data Envelopment Analysis, concluded that loan intensity growth rate of GDP and foreign ownership are better predictors of bank efficiency while non interest expenses, non performance loan and Inflation rate impede bank efficiency.

With the use of Non parametric Data Envelopment Analysis, Inefficiency in Tazanian banks can be traced to inadequate long term capital, poor remuneration, poor management capacity and excess liquidity in terms of technical efficiency. Foreign banks take the lead followed by small and large domestic banks while, small banks are scale efficient followed by foreign and large domestic banks respectively (Aikaeli, 2008).

Efficiency can be improved through investment in new piece of technology. Financial market in India is dominated by public banks and the ranking revealed that they are the most efficient compared to private banks. Consequent to rising number of bank customers, there has been a significant growth in the Jordanian Islamic banks with a concomitant increase in innovation efficiency. Ajlouni and Omari (2009), using both Data Envelopment and Financial Ratio Analysis found that the most profitable banks faced higher risk which makes them operationally inefficient.

According to Ines Ayadi (2013), in the study determinants of Tunisian bank efficiency, using Data Envelopment Analysis, it was discovered that market share in Tunisian banks has inverse impact on their efficiency. Quality of asset suggests that most banks engage in risky activities including credit. In the study, high ratio of quality of asset has negative effect on efficiency because it shows a small yield of bank assets. Tunisian banks tend to be less efficient because they suffer from under evaluation of Credit Risk and misallocation of resources. Therefore, it was denoted that the cost of the Tunisian banks increases with non performing loans.

Employing Data Envelopment fixed effect regression analysis by Sarchez, Hassan and Bartkus (2013), efficient banks in Latin American capitalise earnings in liquidity because the ratio of loan loss reserve to gross loan is negatively related to efficiency and banks with low quality loan are expected to have low efficiency. Also, Kamarudaddin and Rohani (2013) in their Data Envelopment Analysis of efficiency in Malaysian Islamic banks found that size of banking operation, asset quality improves operational efficiency as opposed to corporate social responsibility which is negatively related to cost/operational efficiency. Malaysian banks will be more efficient if they can control non-performing loans, in that the high cost of maintaining loan default will be avoided. Furthermore, employing Data Envelopment Analysis by Endri and Divilestari (2014), it was noted that variable of interest rate is inversely related to technical efficiency and the rate of Inflation on the contrary has positive relationship with banks operational efficiency.

III. Methodology

a) Model Specification

Based on the conceptual framework designed in this study, the following models were formulated to show the relationship between the variables of interest.

$$Y_{it} = \beta_0 + \Sigma \beta_i X_{it} + \epsilon_{it} \quad (1)$$

Explicitly, the model is

$$Y_{it} = \beta_0 + \beta_1 X_{it1} + \beta_2 X_{it2} + \beta_3 X_{it3} + \beta_4 X_{it4} + \beta_5 X_{it5} + \epsilon_{it} \quad (2)$$

$$OE_{it} = \beta_o + \beta_1 CCR_{it} + \beta_2 ETA_{it} + \beta_3 ETL_{it} + \beta_4 DTE_{it} + \beta_5 BR_{it} + \epsilon_{it} \quad (3)$$

Y is the proxy of operational efficiency which was measured by operational efficiency ratio using the accounting approach of the measure of efficiency and X is the proxy of the independent variables which was measured by capital adequacy ratios (X_1, X_2 X_3,X_4,) and Bank Risk ratio (X_5). i stands for the total sample of banks (15) and t denotes the total number of years (10) in consideration.

© 2016 Global Journals Inc. (US)

b) A Priori Expectation

$$\beta_1, \beta_2, \beta_3, \beta_4 \text{ and } \beta_5 > 0$$

Where X_1 (Core Capital Ratio), X_2 (Equity to Total Asset ratio), X_3 (Equity to Total Loan ratio) and X_4 (Debt to Total Equity ratio) are the proxies of capital adequacy. On a priori, the coefficients of X_1, X_2, X_3 and X_4 (capital adequacy) are expected to be positive. According to CBN (2004), capital adequacy serves as a cushion against unexpected loss or fluctuation in operation. So, the higher the capital base of a bank, the higher its activities and the higher its operational efficiency. Following the study of Djalilov *et al.* (2006), some banks in Central Asian countries are inefficient due to low capital adequacy, low profitability and poor asset quality. Also, studies of Gul *et al.* (2001); Goddard (2004); Kosmidou (2008); Odunga *et al.* (2013); Sanchez *et al.* (2013), support positive relationship between capital adequacy and bank earnings, though not all were significant, but with the current situation of Nigerian economy, a positive relationship is expected between capital adequacy and operational efficiency.

IV. Analysis and Discussion of Results

Table 4.1 : Descriptive Characteristics of Variables

Variable	Obs	Mean	Std. Dev.	Min	Max
OE	150	0.15556	0.0703573	0.005	0.413
ETA	150	0.1457867	0.0889667	-0.319	0.413
ETL	150	0.40404	0.3138729	-1.589	1.319
DTE	150	7.857353	15.80529	-7.22	191.21
CCR	150	0.34426	0.2158141	-0.909	0.996
BR	150	0.8481275	0.0981351	0.267	1.319

Source: Author's Computation, 2015 using STATA statistical package 11

Table 4.1 above presents the descriptive statistics of all the variables used in an attempt to determine the influence of capital adequacy on operational efficiency of Deposit Money Banks. The Table reveals that the average value for OE, ETA, ETL, DTE, CCR and BR of the pooled observations for the period and cross sectional unit covered in the study stood at 0.15556, 0.1457867, 0.40404, 7.857353, 0.34426, 0.8481275 respectively. Reported in Table 4.1 are minimum and maximum values of OE which stood at .005 and 0.413 respectively while, for ETL, DTE, CCR and BR, the Table reports minimum and maximum values of -0.319 and 0.413, -1.589 and 1.319, -7.22 and 191.21, -0.909 and 0.996, 0.267 and 1.319 respectively. The standard deviation of the variables stood at 0.0703573 for OE, 0.0889667 for ETA, 0.3138729 for ETL, 15.80529 for DTE, 0.2158141 for CCR, 0.0981351 for BR. It is noteworthy to stress that Table 4.1 only gave the description of the variables used in achieving objective the study which does not call for any form of inferential analysis

Table 4.2 : Correlation Matrix

	OE	ETA	ETL	DTE	CCR	BR
OE	1.0000					
ETA	-0.0848	1.0000				
ETL	0.4357	-0.0783	1.0000			
DTE	-0.3780	0.0929	-0.1634	1.0000		
CCR	0.5779	0.0355	0.5233	-0.3439	1.0000	
BR	-0.5782	0.1233	-0.7147	0.2242	-0.4686	1.0000

Source: Author's Computation, 2015 using STATA Statistical Package 11

Table 4.2 above explains the correlation between operational efficiency and capital adequacy proxied by ratio of Equity to Total Asset (ETA), ratio of Equity to Total Loan (ETL), ratio of Debt to Total Equity (DTE), Bank Risk (BR) and Core Capital Ratio (CCR). The Table shows that there is negative correlation between operational efficiency and capital adequacy proxied by ETA, DTE, BR while, operational efficiency and capital adequacy proxied by ETL and CCR tends to be positive. From the correlation statistics presented in the Table, it can be seen that there is no strong correlation between operational efficiency and capital adequacy rather mildly weak and/or very weak correlation.

Table 4.2 shows positive correlation between capital adequacy proxied by ETA and other proxies of explanatory variables such as DTE, CCR, BR while, the correlation between ETA and ETL is negative. Thus, majority of capital adequacy proxies tend to move in the direction with the ratio of Equity to Total Asset (ETA). Although, the degree of the correlation is weak and/or very weak. Correlation between capital adequacy proxied by ETL and other explanatory variables such as, DTE and BR is negative, but positive for CCR while, there is negative correlation between DTE and CCR. Notably, the correlation between CCR and BR is weak. Lastly, the Table reveals that there is negative correlation between CCR and BR.

© 2016 Global Journals Inc. (US)

It is noteworthy to stress that, correlation analyses presented above only gave information on the degree and direction of relationships between pairs of variables employed in the model corresponding to objective two and three, without any reference to the causal-effect relationship between the variables. Thus, negative/positive correlation coefficients reported in Table 4.2 only depicted the direction of the linear relationship between pairs of variables and/or the strength of such linear relationship. However, the general overview of the correlation coefficient reveals that, there is no indication or possibility of multi-co linearity problem in the model where all the observed variables will be employed.

Table 4.3 : Two-Way Fixed Effect Estimates

Variable	Coefficient	Standard Error	T-Test Values	Probability
C	0.2994814	.0634205	4.72	0.000
ETA	-0.0055735	.0069643	-0.80	0.425
ETL	-0.0057056	.021973	-0.26	0.796
DTE	-0.0008808	.0002779	-3.17	0.002*
CCR	0.1232206	.0265005	4.65	0.000*
BR	-0.2543113	.0653358	-3.89	0.000*
Cross-sectional effects				
ZENITH BANK	0.0033405	.0218654	0.15	0.879
STERLING BANK	0.0103981	.0223073	0.47	0.642
SKYE BANK	0.0004334	.0214986	0.02	0.984
FIRST BANK	0.0251221	.0233023	1.08	0.283
ACCESS BANK	0.0236104	.0209836	1.13	0.263
DIAMOND BANK	-0.0026756	.021795	-0.12	0.903
FCMB BANK	0.0571225	.0217209	2.63	0.010*
IBTC BANK	0.015415	.0271144	0.57	0.571
UNITY BANK	-0.0071874	.0219118	-0.33	0.743
UBA BANK	0.033398	.0216588	1.54	0.126
FIDELITY BANK	0.0489608	.0219899	2.23	0.028*
WEMA BANK	0.0632969	.0258532	2.45	0.016*
UNION BANK	0.0164259	.0248452	0.66	0.510
ECOBANK	0.023981	.0233683	1.03	0.307
Time specific effects				
2005	0.018556	.0175014	1.06	0.291
2006	0.0242585	.0175883	1.38	0.170
2007	0.0040887	.0173376	0.24	0.814
2008	0.012346	.0177444	0.70	0.488
2009	0.0532566	.0174012	3.06	0.003*
2010	0.0625517	.0172537	3.63	0.000*
2011	0.0211278	.0172763	1.22	0.224
2012	0.0295974	.0174324	1.70	0.092
2013	0.000342	.0182631	0.02	0.985

(*) connote rejection at 5% level of significance

Source: Author's Computation, 2015 using STATA statistical package 11

Table 4.3 above presents the two-way fixed effect estimates corresponding to the model used to investigate the influence of capital adequacy on operational efficiency of Deposit Money Banks in Nigeria. The Table shows that all the explanatory variables except Core Capital Ratio exert negative influence on operational efficiency of Deposit Money Banks and thereby denotes that, too much dependence on equity capital should be reduced by banks in Nigeria. Evaluating the result by a priori expectation, it was discovered that the direction of causal-effect relationship between operational efficiency and the explanatory variables contradict expectations. However, the result presented in Table 4.3 reveals that capital adequacy as measured by the likes of ratio of Debt to Total Equity (DTE), Core Capital Ratio (CCR) and Bank Risk (BR) exert significant influence on the operational efficiency while, the influence of other measures of capital adequacy such as ratio of Equity to Total Asset (ETA), and ratio of Equity to Total Loan (ETL) are not significant.

Relating the findings from the result presented in Table 4.3 to previous researches it was discovered that the findings of this study corroborates the findings of past researches; such as Santemero *et al.* (1997), peek *et al.* (1997) where it was asserted that many banks fail or would fail even if their capital were doubled or tripled, meaning capital adequacy does not at all times positively influence operational efficiency, which is the case for some of the measures of capital adequacy

© 2016 Global Journals Inc. (US)

(such as ETA, ETL, DTE and BR) employed in this study. On the other hand, the discovery of negative influence of capital adequacy on operational efficiency contradicts the works of Gardener (1989), Ayodele (1998) and Ekundayo (1999). However, in agreement with the works of Oluyemi (1996); Armar *et al.* (2011), the study attested to the fact that capital adequacy is a significant consideration in the discourse of operational efficiency of Deposit Money Banks.

Table 4.3 also reveals the cross-sectional and time-specific effect of all the subject units (that is, all the banks) for the period covered (2004-2013). The reference/based cross-sectional unit for intercept differential analysis is Guarantee Trust Bank while, 2004 was used as the base period for the time-specific effect analysis. From the Table, it was reported that deviation from the cross-sectional reference point (0.2994814) average 0.0033405 for Zenith Bank, 0.0103981 for Sterling Bank, 0.0004334 for Skye Bank, 0.0251221 for First Bank, 0.0236104 for Access Bank, 0.0026756 for Diamond Bank, 0.0571225 for FCMB Bank, 0.015415 for IBTC Bank, 0.0071874 for Unity Bank, 0.033398 for UBA Bank, 0.0489608 for Fidelity Bank, 0.0632969 for WEMA Bank, 0.0164259 for Union Bank and 0.023981 for Ecobank.

However, close check on the probability values corresponding to each of the cross-sectional intercept differential shows that, there is a significant difference between the based intercept and that of banks like FCMB, Fidelity and WEMA which by implication shows that, there are intrinsic organizational factors influencing operational efficiency of the aforementioned banks which cannot be subsumed or assumed to affect other banks, thus, their heterogeneity/uniqueness. This uniqueness might be attributed to managerial standard/competence, technological acceptance and timeliness of decision making of those banks, towards sustaining operational efficiency.

In like manner, Table 4.3 shows further that there is significant difference in the operational efficiency of Deposit Money Banks in year 2009 and 2010 as against other period given the intercept differential that is significant for the two periods/years. The observed time-specific effect might be traceable to the Central Bank of Nigeria policy of 2009 for instance; the 'stress test' conducted which led to the reclassification of banks not by balance sheet size or asset base, but along the lines of grossly endangered, in dangers and healthy.

V. Conclusion and Recommendations

Premise on the findings in this paper, it is concluded that capital adequacy of Deposit Money Banks of Nigeria has not attained a level where its contribution can significantly spur operational efficiency. Out of CAMEL rating system of banks, other variables like Asset quality, Managerial Efficiency and Liquidity of banks must be given consideration. This prompts the following policy recommendations to ensure better interrelationship between capital adequacy and operational efficiency of Deposit Money Banks in Nigeria.

a) For effective performance, each bank should be allowed to set its own benchmark depending on the desired cushion level and to commensurate with their risk exposures. There are some of the banks that are strong enough to set a capital base more than ₦25 billion while, some that are small can be allowed to set a level they are capable to afford so as to avoid declaration of fictitious assets as earlier proclaimed by Sanusi (2010).
b) The government should make the environment conducive for banks to operate by providing basic amenities like electricity, good roads and other infrastructures. Most importantly, electricity supply constitutes the major operating cost incurred by Nigerian banks.
c) In CAMEL rating system of banks, the apex banks has placed high concentration on the capital adequacy, their attention should also be shifted to asset quality, managerial efficiency and banks liquidity by trying to adopt the Basle III whose focus is based on liquidity management of banks.
d) The risk weight categorization and computation of banks' asset should be consistent and it should be more standardized and adequately publicized to ensure easy accessibility to all users.
e) The regulatory authority should ensure that the gains of the banking reforms processes are sustained and the Central Bank of Nigeria should take more decisive measures aimed at tightening the risk management framework of the Nigerian banking sector as this will have a positive effect on their operational efficiency.

VI. Limitation of the Study and Suggested Area for Further Study

The major limitation of the study is the inability to incorporate all the existing 21 Deposit Money Banks in Nigeria due to unavailability of data which is traceable to the fact that they are not listed on the Nigerian Stock Exchange and their activities are unstable and unsteady. Also, data to capture some of the variables that would have been used to measure capital adequacy were not available in the annual reports and accounts of the banks for all the years covered by the study due to the changes in preparation of accounts from Statement of Accounting Standards (SAS) to International Accounting Standards (IAS) and currently on International Financial Reporting Standards (IFRS). However, the aforementioned limitations do not in any way affect the authenticity of these findings.

© 2016 Global Journals Inc. (US)

Further research should consider other financial institutions most importantly, insurance companies. Would-be researchers can also carry out a comparative study on using both profitability and operational efficiency as a measure of Deposit Money Banks' performance over the years.

References Références Referencias

1. Aikaeli, .J. (2008). *Commercial Banks Efficiency in Tanzania*. International Conference on Economic Development in Africa. No 1.
2. Ajlouni, M. M., & Omari, H. O. (2010). Performance Efficiency of the Jordanian Islamic Banks using Data Envelopment Analysis & Financial Ratio Analysis. *European Journal*, *3*(1), pg. 271-281.
3. Armer, H. M. H., Moustafa, W., & Eldomiaty, T. (2011, June). Determinants of operating efficiency for lowly & highly competitive banks in Egypt. *Journal of Cambridge Business & Economics Conference,* No 33.
4. Ayodele, O. (1988, Jan-June). The Nigerian Banking & Financial Environment: Bank of Nigeria. *Nigeria Banker, 4*(1), pg. 1-18.
5. Beck, T., Levine, R., & Norman, L. (2000). Finance & sources of growth. *Journal of Monetary Economics,* 46, pg. 31-77.
6. Berger, A. N., & Mester, L. B. (1997). Inside the black box: what explains differences in the efficiencies of financial institution? *Journal of banking & finance,* 21. pg. 895-947.
7. Eisenbeis, R. A., & Gilbert, G. G. (1985). Market discipline & the prevention of bank problems & failure. *Issues in banking regulation*, 1(3), pg. 27-42.
8. Fama, E. F. (1965). The Behaviour of Stock-Market Prices. *Journal of Business, 38*(1), pg. 34-105.
9. Fama, E. F. (1970). Efficient Capital Markets: A Review of Theory & Empirical Work. *Journal of Finance, 25*(3), pg. 383-417.
10. Familoni, J. A. (2000). *Management of Banks & Financial Institutions.* Ado-Ekiti: Bab's Publication.
11. Isik, I., & Hassan, M. K. (2002). Cost & profit Efficiency of the Turkish banking Industry: An empirical investigation. *The financial review,* 37, pg. 257-280.
12. Isik, I., & Hassan, M. K. (2003). Efficiency, ownership & market structure, corporate control & governance in the Turkish banking industry. *Journal of Business Finance & Accounting,* 30, pg. 1363–1421.
13. Ismail, F., Rahim, R., & Majid, M. S. (2009). Determinants of Efficiency in Malaysian Banking Sector, *3*(2), pg. 291-302.
14. KarimZadeh, M. (2012). Efficiency analysis by using Data Envelop Analysis Model: Evidence from Indian Banks. *International Journal of Finance, Economics & Science, 2*(3), pg. 228-237.
15. Kim, D., & Santomero, P. (1988). Risk in Banking & Capital Regulation. *The Journal of Finance*, *43*(5), pg. 265-278.
    Kwan, S. H. (2003). Operating performance of banks among Asian economies: An international & time series comparison. *Journal of Banking & Finance,* 27, pg. 471-489.
17. Kwan, S., & Eisenbeis, V. (1995). An Analysis of Inefficiencies in Banking. *Journal of Banking & Finance*, *19*(3-4), pg. 733-739.
18. Ncube, M. (2009). *Efficiency in the Banking Sector in South Africa*. African Economic Conference 2009. Fostering Development in an Era of financial & Economic Crises, Addis Ababa.
19. Obafemi, F. N., Ayodele, O. S., & Ebong, F. S. (2013). The sources of Efficiency in the Nigerian Banking Industry; A Two-Stage Approach. *International Journal of Finance & Banking Studies, 2*(4), pg. 2147-4486.
20. Odunga, R. M., Nyangweso, P. M., Carter D. A. & Mwarumba, M. (2013). Credit Risk, capital adequacy & operational efficiency of commercial banks in Kenya. *International Journal o f Business & Management invention, 2*(9), pg. 06-12.
21. Oke, D. M., & Poloamina, I. D. (2012). Further Analysis of Bank Efficiency Correlates: The Nigerian Experience. *Journal of Applied Finance & Banking, 2*(4), Pg. 1-11.
22. Oluyemi, S. A. (1996). The implication of banks' profitability on implementing the risk based capital requirement: *NDIC Quarterly review*, *2*(3), pg. 45-56.
23. Reserve Bank of New Zealand, (2004). Capital adequacy ratios for banks-simplified explanation & examples for calculation.
24. Said, A. (2012). Comparing the Change in Efficiency of the Western & Islamic Banking Systems. *Journal of Money, Investment & Banking, 10*(23)*, pg.1114-1126.*
25. Samad, A. (2004). Bahrain Commercial Bank's Performance during 1994-2001. *Credit & Financial Management Review. 10*(1), pg. 33-40.
26. Sanchez, B., Hassan, M. K., & Bartkus, J. R. (2013). Efficiency Determinants & Dynamic Efficiency changes in Latin American Banking Industries. *Journal of Centrum Cathedra, 5*(2)*,* pg. 282-294*.*
27. Santomero, A. M., & Vinson, J. D. (1977). Estimating the probability of failure for commercial banks & banking system. *Journal of Banking & Finance,* 1, pg. 185-205.
28. Sanusi, L. S. (2010). The Nigerian banking industry: What went wrong & the way forward. Being an address delivered at the convocation Square.
29. Sharma, S., Raina, D. & Singh, S. (2012). Measurement of Technical Efficiency & its sources: An Experience of Indian Banking Sector. *International Journal of Economics & Management*, *6*(1). pg. 35-57.

© 2016 Global Journals Inc. (US)

30. Wall, L. D. (1985, 4th November). Regulation of Banks' Equity Capital. Economic review, Federal Reserve Bank of Atlanta.

© 2016 Global Journals Inc. (US)

This page is intentionally left blank

© 2016 Global Journals Inc. (US)