

1 Capital Base and Operational Efficiency in Nigerian Deposit 2 Money Banks (Evidence from a Two-Way Fixed Effect Approach)

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6

7 **Abstract**

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

18

19 **Index terms**— capital adequacy, core capital, two-way fixed effect, operational efficiency, deposit money
20 banks.

21 **1 Introduction**

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

40 Studies on the importance of operating efficiency for banks in other economies revealed that the key
41 determinants of operational efficiency were affected by the global financial crisis ??Siraj & Pillai, 2011). This
42 reinforces the need to understand the drivers of operational efficiency for proper risk management in the Nigerian
43 Deposit Money Banks. The high interest charged by Nigerian banks could be attributed to the inability to push

5 II. MEANING OF OPERATIONAL EFFICIENCY OF BANKS

44 their operational costs downwards despite the increase in capital base of Nigerian banks. This may be due to
45 many challenges in respect of costs and management of risks which banks are exposed to. Operating efficiency
46 is one of the most critical risks faced by financial institutions in the Nigerian environment. For the banking
47 institution to make the best use of their capital base, it is paramount for the sector to operate efficiently.

48 From happenings in the banking sector, it is evident that some banks were able to meet the 2005 recapitalisation
49 of N25b but still failed in 2009. Could this be a signal that some of the capitals raised by banks on the stock
50 exchange were fictitious as earlier raised by Sanusi (2010)? Surprisingly, few years after the much publicised
51 consolidation in Nigeria, some of these banks that merged together or absorbed other smaller banks to meet up
52 with the N25b requirement were later declared distress in 2009. However, some of the banks which were able to
53 withstand the re-capitalisation exercise of 2005 without absorbing or merging with other banks are still sound up
54 till date and they are not failing. Could it be that, those few banks that stood alone throughout these hurdles
55 are operating efficiently without any distress because of their broad and adequate capital base?

56 From the empirical literature, it is worthy of note that not many studies have examined the relationship
57 between capital adequacy and operational efficiency of banks in Nigeria. However, some researchers in developed
58 and other developing economies have examined the impact of bank capital adequacy on operational efficiency and
59 they found out that wellcapitalised banks are better run with low unit cost; thereby operating efficiently. Some
60 of these studies include: ??erger and Young (1997) in the United State of America; ??wan and Eisenbeis (1997)
61 With the aforementioned problems in Nigerian banking sector and with the available literature, it is evident that
62 there is the need to dig deep into the capital base of banks in order to know the relationship between capital
63 adequacy and operational efficiency. Thus, this paper is aimed at critically examining banks' capital adequacy
64 and operational efficiency in Nigeria. a) Objectives of the Study a. To examine the effect of capital adequacy on
65 banks' operational efficiency in Nigeria b. To measure banks operational efficiency using the accounting approach
66 (that is, Financial Ratio Analysis)

67 2 b) Hypothesis of the Study

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

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

73 3 II.

74 4 Review of Related Liteatures a) Conceptual Review i. Mean- 75 ing of Banks' Capital Adequacy

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

83 5 ii. Meaning of Operational Efficiency of Banks

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

91 According to Beck et al. (2000), Efficiency in intermediation of funds from savers to borrowers enables
92 allocation of resources to their most productive users. The more efficient a financial system is in resource
93 generation and in its allocation, the greater its contribution to productivity and economic growth. According
94 to Chen (2001), Efficiency in banking has been tactically defined and studied in different dimensions including:
95 (i) Scale efficiency (ii) Scope efficiency and (iii) Operational efficiency, a wide concept sometimes referred to as
96 x-efficiency. Scale and Scope economies, for example, are achieved from the firms' output expansion resulting
97 in an increase in the industry's output and reduction in the costs of production thus leading to the strong
98 technological external economy. A bank has the scale efficiency, when it operates within the range of constant
99 return to scale. Scope efficiency comes into play when the bank operates in different numerous locations. But the
100 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

102 combination of these three, can increase output of goods and services and reduce costs. Operational efficiency is
103 the tactical planning of an organization to maintain a safe balance between cost and productivity. It identifies the
104 wasteful processes that contribute to loss of resources and organizational profits. It deals with minimizing waste
105 and maximizing the benefits of resource to provide better services to the customers. For effective competition,
106 lowering costs is the best option as internal wastage enhances more cost. Any input that is not processed through
107 a system so as to generate useful output is a waste. It means producing more goods and rendering services with
108 no greater use of resources to commensurate with income generated from the production or services.

109 iii Financial Institutions have started entering insurance business of which banks are not exempted. From
110 mere offering of insurance products through network of bank branches, the business is likely to expand through
111 self-designed insurance products after necessary legislative changes. d. Reducing overstaffing and introducing
112 other measures for improving revenue generation. This strategy would increase the productivity of the banks. A
113 bank does not need to create irrelevant branches that will increase the number of staff and thereby jack up their
114 operating cost. e. Corporate Governance: Good corporate governance would bring financial stability and reduces
115 high profile breakdowns. The transparency of the banks' operation is emphasized by the corporate governance.
116 Following the Good Governance Practices is essential for building public confidence and faithful reporting.

117 **6 Components of Independent Variables Dependent Variable**

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

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

130 **7 b) Theoretical Underpinning**

131 **8 i. The Regulatory and Efficient Market-Monitoring Hypothesis**

132 This was first introduced by Fama (1965; 1970) and it states that regulators encourage banks to increase their
133 capital to measure up with the amount of risk taken by banks. This may be achieved through efficient market
134 monitoring mechanisms that will call for banks efficiency relates to the behaviours of regulators and supervisors.
135 Banks could respond to regulatory actions forcing them to increase their capital by increasing asset risk (Kim
136 & Santomero, 1988). The need to control the high incidence of loan default occasioned by increased lending
137 activities was a popular motive for reforms in financial systems in developing economies. Harley (2011), stated
138 that government should regulate investment policy for banks for them to be more efficient and be globally
139 competitive.

141 **9 c) Empirical Review on Capital Adequacy and Operational 142 Efficiency of Banks**

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

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

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

155 Is a bank's capital-to-assets ratio significantly related to its probability of failure? Most research studies find
156 little connection between capital ratios and the incidence of bank failure. For example, Santomero and Vinso
157 ??1977) found that increased capital does not materially lower a bank's failure risk. Many banks would still fail
158 even if their capital were doubled or tripled -a conclusion backed up by a recent study in New England by Peek

9 C) EMPIRICAL REVIEW ON CAPITAL ADEQUACY AND OPERATIONAL EFFICIENCY OF BANKS

159 and Rosengren (1997) which found that fourfifths of bank's failing in the 1980s and early 1990s were classified
160 by examiners as 'well capitalized' before they failed. It is by no means certain that imposing higher capital
161 requirements will reduce banking risk. As Wall (1989) observed, banks faced with tougher capital standards may
162 take on more risk in other aspect of their operations in order to keep from earning lower returns.

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

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

170 While mandatory capital ratios help to set a corresponding profit target for banks, capital adequacy might
171 influence banks cost of capital and its overall cost of fund. Ceteris paribus, higher capital adequacy ratios may
172 restrict the competitive abilities of banks. Apart from this, they also affect banks growth capabilities. This view
173 takes into consideration the effect mandatory capital ratios have on banks performance being that if the banks
174 are not able to meet up with the mandatory capital ratio, it places a constraint on their lending abilities which
175 eventually affects their primary aim of money creation. Oluyemi (1996), stated that capital plays a significant
176 role in the banking sectors of an economy. The need for adequacy capital for banks is a pressing problem not
177 only in Nigeria but also to a very large extent in many countries especially in developing economies.

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

184 Sharma, Raina and Singh (2012) employed panel data through stochastic frontier analysis model to measure
185 the source of technical efficiency of Indian banking sector. The major determinant of technical efficiency as
186 revealed by the study are fixed asset, deposit and deposit to total liabilities while, the cash deposit ratio is not
187 insignificant. In a study on the determinants of operating efficiency in Egypt banking sector, Armar, Mustapha
188 and Eldomiaty (2011) found Thus, an important factor contributing to a positive relationship between capital
189 adequacy and asset quality, capital adequacy, credit risk and liquidity as the main determinants of efficiency in
190 the highly competitive banks.

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

195 Employing Data Envelopment Analysis, it is evident that the main sources of efficiency in Nigerian banking
196 sector is market size and the banking sector is not efficient in the pre and post liberalization period because of the
197 distribution in the financial system. ?? With the use of Non parametric Data Envelopment Analysis, Inefficiency
198 in Tazanian banks can be traced to inadequate long term capital, poor remuneration, poor management capacity
199 and excess liquidity in terms of technical efficiency. Foreign banks take the lead followed by small and large
200 domestic banks while, small banks are scale efficient followed by foreign and large domestic banks respectively
201 (Aikaeli, 2008).

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

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

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

222 of interest rate is inversely related to technical efficiency and the rate of Inflation on the contrary has positive
223 relationship with banks operational efficiency.

224 10 III.

225 11 Methodology a) Model Specification

226 $Y_{it} = \alpha_0 + \alpha_1 X_{it1} + \alpha_2 X_{it2} + \alpha_3 X_{it3} + \alpha_4 X_{it4} + \alpha_5 X_{it5} + \epsilon_{it}$ (1)

227 Explicitly, the model is $Y_{it} = \alpha_0 + \alpha_1 CCR_{it} + \alpha_2 ETA_{it} + \alpha_3 ETL_{it} + \alpha_4 DTE_{it} + \alpha_5 BR_{it} + \epsilon_{it}$
228 $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ (2)
229 $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ (3)

230 Y is the proxy of operational efficiency which was measured by operational efficiency ratio using the accounting
231 approach of the measure of efficiency and X is the proxy of the independent variables which was measured by
232 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
233 (15) and t denotes the total number of years (10) in consideration.

234 Based on the conceptual framework designed in this study, the following models were formulated to show the
235 relationship between the variables of interest. b) A Priori Expectation $\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5 > 0$ Where X_1
236 (Core Capital Ratio), X_2 (Equity to Total Asset ratio), X_3 (Equity to Total Loan ratio) and X_4 (Debt to Total
237 Equity ratio) are the proxies of capital adequacy. On a priori, the coefficients of X_1, X_2, X_3 and X_4 (capital
238 adequacy) are expected to be positive. According to ??BN (2004), capital adequacy serves as a cushion against
239 unexpected loss or fluctuation in operation. So, the higher the capital base of a bank, the higher its activities
240 and the higher its operational efficiency. Following the study of ??jalilov et al. (2006) Sanchez et al. (2013),
241 support positive relationship between capital adequacy and bank earnings, though not all were significant, but
242 with the current situation of Nigerian economy, a positive relationship is expected between capital adequacy and
243 operational efficiency.

244 12 IV.

245 Analysis and Discussion of Results Table 4.1 above presents the descriptive statistics of all the variables used
246 in an attempt to determine the influence of capital adequacy on operational efficiency of Deposit Money Banks.
247 The Table reveals that the average value for OE, ETA, ETL, DTE, CCR and BR of the pooled observations for
248 the period and cross sectional unit covered in the study stood at 0.15556, 0.1457867, 0.40404, 7.857353, 0.34426,
249 0.8481275 respectively. Reported in Table 4.1 are minimum and maximum values of OE which stood at .005
250 and 0.413 respectively while, for ETL, DTE, CCR and BR, the Table reports minimum and maximum values of
251 -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
252 deviation of the variables stood at 0.0703573 for OE, 0.0889667 for ETA, 0.3138729 for ETL, 15.80529 for DTE,
253 0.2158141 for CCR, 0.0981351 for BR. It is noteworthy to stress that Table 4.1 only gave the description of the
254 variables used in achieving objective the study which does not call for any form of inferential analysis Table 4.2
255 above explains the correlation between operational efficiency and capital adequacy proxied by ratio of Equity to
256 Total Asset (ETA), ratio of Equity to Total Loan (ETL), ratio of Debt to Total Equity (DTE), Bank Risk (BR)
257 and Core Capital Ratio (CCR). The Table shows that there is negative correlation between operational efficiency
258 and capital adequacy proxied by ETA, DTE, BR while, operational efficiency and capital adequacy proxied by
259 ETL and CCR tends to be positive. From the correlation statistics presented in the Table, it can be seen that
260 there is no strong correlation between operational efficiency and capital adequacy rather mildly weak and/or very
261 weak correlation. Table 4.2 shows positive correlation between capital adequacy proxied by ETA and other proxies
262 of explanatory variables such as DTE, CCR, BR while, the correlation between ETA and ETL is negative. Thus,
263 majority of capital adequacy proxies tend to move in the direction with the ratio of Equity to Total Asset (ETA).
264 Although, the degree of the correlation is weak and/or very weak. Correlation between capital adequacy proxied
265 by ETL and other explanatory variables such as, DTE and BR is negative, but positive for CCR while, there
266 is negative correlation between DTE and CCR. Notably, the correlation between CCR and BR is weak. Lastly,
267 the It is noteworthy to stress that, correlation analyses presented above only gave information on the degree
268 and direction of relationships between pairs of variables employed in the model corresponding to objective two
269 and three, without any reference to the causal-effect relationship between the variables. Thus, negative/positive
270 correlation coefficients reported in Table 4.2 only depicted the direction of the linear relationship between pairs
271 of variables and/or the strength of such linear relationship. However, the general overview of the correlation
272 coefficient reveals that, there is no indication or possibility of multi-co linearity problem in the model where all
273 the observed variables will be employed. Evaluating the result by a priori expectation, it was discovered that
274 the direction of causal-effect relationship between operational efficiency and the explanatory variables contradict
275 expectations. However, the result presented in Table 4.3 reveals that capital adequacy as measured by the likes of
276 ratio of Debt to Total Equity (DTE), Core Capital Ratio (CCR) and Bank Risk (BR) exert significant influence
277 on the operational efficiency while, the influence of other measures of capital adequacy such as ratio of Equity
278 to Total Asset (ETA), and ratio of Equity to Total Loan (ETL) are not significant.

279 Relating the findings from the result presented in Table 4.3 to previous researches it was discovered that the
280 findings of this study corroborates the findings of past researches; such as Santemero et al. (1997), peek et al.
281 ??1997) where it was asserted that many banks fail or would fail even if their capital were doubled or tripled,

14 LIMITATION OF THE STUDY AND SUGGESTED AREA FOR FURTHER STUDY

282 meaning capital adequacy does not at all times positively influence operational efficiency, which is the case for
283 some of the measures of capital adequacy (such as ETA, ETL, DTE and BR) employed in this study. On the
284 other hand, the discovery of negative influence of capital adequacy on operational efficiency contradicts the works
285 of Gardener (1989), Ayodele (1998) and Ekundayo (1999). However, in agreement with the works of Olyuemi
286 (1996); Armar et al. ??2011), the study attested to the fact that capital adequacy is a significant consideration
287 in the discourse of operational efficiency of Deposit Money Banks.

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

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

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

308 13 V. Conclusion and Recommendations

309 Premise on the findings in this paper, it is concluded that capital adequacy of Deposit Money Banks of Nigeria
310 has not attained a level where its contribution can significantly spur operational efficiency. Out of CAMEL rating
311 system of banks, other variables like Asset quality, Managerial Efficiency and Liquidity of banks must be given
312 consideration. This prompts the following policy recommendations to ensure better interrelationship between
313 capital adequacy and operational efficiency of Deposit Money Banks in Nigeria. a) For effective performance, each
314 bank should be allowed to set its own benchmark depending on the desired cushion level and to commensurate
315 with their risk exposures. There are some of the banks that are strong enough to set a capital base more
316 than N25 billion while, some that are small can be allowed to set a level they are capable to afford so as to
317 avoid declaration of fictitious assets as earlier proclaimed by Sanusi (2010). b) The government should make
318 the environment conducive for banks to operate by providing basic amenities like electricity, good roads and
319 other infrastructures. Most importantly, electricity supply constitutes the major operating cost incurred by
320 Nigerian banks. c) In CAMEL rating system of banks, the apex banks has placed high concentration on the
321 capital adequacy, their attention should also be shifted to asset quality, managerial efficiency and banks liquidity
322 by trying to adopt the Basle III whose focus is based on liquidity management of banks. d) The risk weight
323 categorization and computation of banks' asset should be consistent and it should be more standardized and
324 adequately publicized to ensure easy accessibility to all users. e) The regulatory authority should ensure that the
325 gains of the banking reforms processes are sustained and the Central Bank of Nigeria should take more decisive
326 measures aimed at tightening the risk management framework of the Nigerian banking sector as this will have a
327 positive effect on their operational efficiency.

328 VI.

329 14 Limitation of the Study and Suggested Area for Further 330 Study

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

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Figure 1: D

. 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:

[Note: 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.]

Figure 2:

Figure 3:

14 LIMITATION OF THE STUDY AND SUGGESTED AREA FOR FURTHER STUDY

41

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

Figure 4: Table 4 . 1 :

Capital Base and Operational Efficiency in Nigerian Deposit Money Banks
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Effect Approach)
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Year
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Figure 5:

4

	OE	ETA	ETL	2 : Correlation Matrix		
				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	-	1.0000	
BR	-0.5782	0.1233	-0.7147	0.2242	-	1.0000
					0.3439	
						0.4686

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

Figure 6: Table 4 .

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

Figure 7: Table 4 . 3 :

Figure 8: Table 4 .

**14 LIMITATION OF THE STUDY AND SUGGESTED AREA FOR
FURTHER STUDY**

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

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