

## Loan Portfolio Quality and Efficiency of Quoted Deposit Money banks in Nigeria

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**ABSTRACT:** Banking world over is adjusting to profound changes following the backdrop of current economic downturn with its significant impact on global financial outlook. In the face of corona virus diseases 2019 (covid 19) pandemic, most entities including Banks are experiencing general economic conditions associated with financial market volatility and erosion, deteriorating credits and loan portfolio, liquidity concerns, further increases in government intervention, increasing unemployment and layoffs, broad declines in consumer discretionary spending, increasing inventory levels, and general reductions in production because of decreased demand.

This study investigates loan portfolio quality and efficiency of Quoted Deposit Money Banks (DMBs) in Nigeria amidst these phenomena. The population of the study consists of all the quoted Deposit Money Banks in Nigeria with sample of selected 8 surviving Deposit Money Banks with international authorization in Nigeria as at December, 2019. Using data envelopment analysis. The findings of the study reveals that the percentage value of loan portfolio at risk (VaR) and compliance level to prudential provisioning has negative effect on the efficiency of Quoted Deposit Money banks in Nigeria. While Management response to early warning triggers of non-performing loan has a significant positive impact on efficiency but capital adequacy does not in any way determine how efficient Quoted Deposit Money Banks in Nigeria are performing. The study therefore, recommends that, the management of Quoted Deposit Money Banks in Nigeria should intensify efforts in monitoring their loan portfolio and put in place adjustable risk coverage mechanism for safeguarding the asset quality. The managements of the banks are also advised to strengthen internal credit policies that will screen out potential bad loans and build a healthy and recoverable loan portfolio.

**KEYWORDS:** Loan portfolio quality, Bank efficiency, Value at risk and Deposit Money Banks.

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### INTRODUCTION

Nigerian banking system has undergone significant changes over the years, in relation to the number of institutions, ownership structure, as well as complexity and extensiveness of operations. These changes Kargi (2017) notes have been influenced largely by challenges posed by financial crises and economic downturns; deregulation of the financial sector, globalization of operation, technological innovations and adoption of regulatory requirements that conform to international standards, making banking business one of the most heavily regulated sector of the economy.

Prior to the outbreak of COVID-19, the 2008 financial crises caused large balance sheet impairment, notably for many banks in both developing and advanced countries. Loan generation and credit risk have understandably been guided by a plethora of prudential guidelines and policies. The thrust was, and still is the optimal mix of sound risk assets and returns that maximizes the value of the Bank reflected in part, in its profitability. It should be noted that oftentimes, prudential tools such as liquidity ratio, loan to deposit ratio, large exposure and reserve requirement have been applied to address the problem of non-performing loans. The Central Bank of Nigeria (CBN) originally sets an average loan to deposit ratio (LDR) of 60%, non-performing loan ratio (NPL) of 5%, Capital adequacy ratio (CAR) of 10%, and liquidity ratio (LR) of 30% and expects all DMBs to stay within this range. However, most DMBs NPL position remains above the prudential benchmark of 5.0%. Whereas in 2019, pursuant of economic recovery policies, CBN increased LDR to 65% so as to encourage lending without tackling inflation and interest rates. Moody (2019) argues such policy could cause downside risk on NPLs and may prompt markets to pricing negative headlines for the banks and hinder input-output efficiency.

As a consequence, the evolving role of loan portfolio management is characterized with growing complexities of large and multifaceted distribution most often with illiquid loans. Banks can no longer manage loan book in isolation with individual

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borrower's risk evaluation, in contrast to the traditional credit and concentration risk, Banks look at entire loan book as aggregate credit risk and seek to improve returns on those risks. Doyin (2019) notes that the way loan portfolio quality is determined to a large extent has spurred the need to align and comply with regulatory requirements, especially with respect to capital and liquidity, increasing cost, margin pressures and in the face of emerging market conditions.

Loan portfolio, which is literally the total of all loans held by a Bank or financial institution at any given date or point in time. Loan portfolio constitutes loans that have been created or bought and are being held for repayment in the book of the Bank. Global Risk Management Group (2009) defines Loan exposure as a measure of the maximum possible potential loss to a lender if the borrower defaults in payment. Loan exposure is a component of credit risk: most Banks seek to limit their exposure by extending credit to customers with high credit ratings based on appraisal score and calculated risk. Deposit Money Banks always battle with loan exposure at default and their probability of default. Loan portfolio quality can be determined by the estimated level of portfolio repayment, collection and recovery rate. As such, credit limit helps DMBs to determine loan extension, but where loan customer or group of customers encounter unexpected financial problems, the Bank may seek to reduce the impact of exposure by restructuring to mitigate the loss that arises from potential default. Value at Risk (VaR) of a portfolio is the maximum loss on a portfolio occurring within a given period of time with a given probability.

Bank Efficiency is implicitly the quantitative measure of useful output to total input of a Deposit Money Bank. It often specifically refers to the capability of a Bank in the application of effort and resources to produce desirable outcome with minimal loss or waste. Efficiency in banking could be appropriately described as a measure of productive or operational processes that deals with minimizing loan losses and maximizing returns. The more efficient a deposit money bank is in resource generation and its allocation to quality credits, the greater the productivity and profitability. It is therefore pertinent to note that Banks' performance is not only measured in terms of profit but with the relative indicators of efficiency.

A number of studies have been carried out on credit risk, non-performing loans and Bank performance. Notably, Lawrence & Hassan (2018); Kolapo, Ayeni & Oke (2012); Aghababaei, Ataei & Azizkhani (2011) and Biersaker, Brody and Pacini (2006) in their various works on determinants of credit quality and Bank performance pointed to the modern loan portfolio theory of Harry Markowitz (1959) but did not relate performance with efficiency which is consistent with value relevance theory of Campbell & Cunningham (1983). In addition, most of these works focus on the traditional bank financial ratios to measure the determinants of financial performance while the measure of input – output efficiency has not been critically examined. Consequently, this study is set to fill the gap by investigating loan portfolio quality and efficiency of quoted Deposit Money Banks in Nigeria.

### OBJECTIVE OF THE STUDY

The main objective of this study is to examine loan portfolio quality and efficiency of quoted Deposit Money Banks in Nigeria, the other specific objectives include:

- i. To examine the effect of loan portfolio value at risk (VaR) on efficiency of quoted Deposit Money Banks in Nigeria.
- ii. To determine the impact of prudential loan loss provisioning on efficiency of quoted Deposit Money Bank in Nigeria.
- iii. To determine the effect of capital adequacy on efficiency of quoted Deposit Money Bank in Nigeria

### HYPOTHESES OF THE STUDY

Based on the above objectives, the following hypotheses were formulated in null form:

Ho1: Loan portfolio value at risk (VaR) has no significant effect on efficiency of quoted Deposit Money Banks in Nigeria.

Ho2: Prudential loan loss provisioning (LLP) has no significant impact on efficiency of quoted Deposit Money Banks in Nigeria.

Ho3: Capital adequacy (CA) has no significant effect on efficiency of quoted Deposit Money Bank in Nigeria.

Consequently, stakeholders, shareholders, the management of quoted Deposit Money Banks in Nigeria, Nigerian Deposit Insurance Corporations, and Central Bank of Nigeria stand to benefit tremendously from the outcome of this research. This paper covers four sections – section one is the introduction, section two contains theory and evidence where arguments are presented and previous literatures are reviewed, methodology is discussed in section three. Results, policy implications and conclusion are presented in sections four accordingly.

### THEORY AND EVIDENCE

**Modern Portfolio Theory:** This theory as originally postulated by Harry Markowitz (1959) states that asset returns are normally distributed and that investors face a risk-return trade-off. According to this theory an optimal combination of earning assets for the investors would yield the highest possible return for a given level of risk or the least possible risk for a given level of return.

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Portfolio theory is presented in mathematical formulation and clearly gives the idea of diversifying the asset investment combination with the aim of selecting the combination of assets that will yield the highest return at a given level of risk. The risk due to NPLs was measured by use of standard deviation. When different assets are combined and whose returns are not perfectly positively correlated then portfolio theory leads to reduction of the total variance of such asset Combination over the given period of investments. Portfolio theory is the most frequently applied to analyses of financial assets.

Alen & Rai (2006) noted that the level of risk and NPLs in a portfolio depended on risk of each loan proportion of resources allocated on each loan and the nature of relationship between the returns of the loans forming the portfolio. The major assumption of portfolio theory in managing risk are that the investors are rational hence prefer more returns to less, investors are risk averse; and expects more output compare to their input, and assume that the market is perfect and efficient. The Bank must manage its loan portfolio in such a way that returns is high, while risk is kept to minimum

**Regulatory and Efficient Market-Monitoring Theory:** This hypothesis as presented by Fama (1965; 1970) holds that regulators encourage banks to increase their capital to measure up with the amount of 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. 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 regulators should provide investment guidelines and policies for Banks to enable them to be more efficient and be globally competitive.

**Value-Relevance Portfolio Theory:** This model analyzes optimal portfolio choice and consumption with values management in the organization-supplier-customer triadic relationship. The customer value concept it utilized to assess product performance and eventually to determine the competitive market structure and the product-market boundaries (Campbell and Cunningham 1983). The extent of business performance determines the relative risk aversion in terms of functional and efficient resource utilization. The model assumes that a high functional value deployed and integrated into organization determines the relative outcomes. Banking sector output is measured based on its gross value added

### METHODOLOGY AND MODEL SPECIFICATION

Ex-post facto research design is adopted for the purpose of this study. This design is suitable because those data to be extracted were not specifically meant for the purpose of this research but for other purposes. In addition, the approach of the research is quantitative in nature and ex-post facto is one of the quasi-experimental research designs which are a social science research design. The population of this study comprises of all the quoted Deposit Money Banks in Nigeria listed on the Nigerian Stock Exchange as at 31<sup>st</sup> December 2019 of which 8 surviving banks with international authorization in Nigeria taken as sample size. Secondly source of data collection is adopted where the annual audited report and account of these banks and the Nigerian Deposit Insurance Corporation annual report is used to extract the relevant data for the study. Data envelopment technique is used to examine loan portfolio quality and efficiency of Deposit Money Banks in Nigeria. Data envelopment analysis (DEA) is one major technique applied in advanced studies for measuring efficiency of companies. The model under the nonparametric method has been used extensively in previous literatures to measure the efficiency of a bank system. The power of this technique to examine the one variable (dependent) against two or more independent variables was behind the choice of this technique. Therefore, in order to set the hypotheses formulated and achieve the choice of this the study, the following model is specified:

$$Y = B_0 + B_1 \text{VaR}_{it} + B_2 \text{LLP}_{it} + B_3 \text{CA}_{it} + \text{ET}_{it}$$

Where:

$B_0$  = Constant intercept

$B_1$ - $B_3$  = Coefficient of the parameters

$I_t$  = Bank and year

ET = error term

**TABLE 1: Variable Measurement**

S/No.	Variables/Proxies	Measurement
1.	Bank Efficiency (Eff)	Ratio of Input – output to Total Income
2.	Value at Risk VaR	Ratio of NPL+impaired to Total Loan Portfolio
3.	Loan loss provisioning (LLP)	Ratio of loss provision expense to Total loan
4.	Capital adequacy(CA)	Ratio of Bank capital to Total value of loan portfolio

Source: Lawrence & Hassan, (2018)

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### Result and Discussion

This section discusses the result of the study, starting with the descriptive statistical ratio analysis and the summary of the data envelopment analysis of input- output result.

### Descriptive Statistics

The following table 2 describes the name of bank and trend of the ratios for the dependent and independent variables.

**TABLE 2: Descriptive Statistics**

Year	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	AvR
<b>Bank</b>											
Access	1.42	1.38	0.94	2.57	2.04	2.05	2.54	2.05	2.52	2.63	20.14
Fidelity	0.28	1.27	0.35	1.99	0.71	1.16	1.13	0.75	2.49	2.16	12.29
FCMB	0.12	1.47	-1.54	1.66	1.59	1.89	0.41	1.22	2.26	2.23	11.31
First Bank	0.23	1.45	0.65	2.37	1.82	1.91	0.56	0.36	1.39	1.86	12.6
Guaranty	2.68	3.33	3.09	5	4.28	4.63	3.94	4.24	4.11	3.71	39.01
Union	-20.23	9.54	-7.83	0.71	0.61	2.63	1.33	1.23	1.65	1.78	-8.58
UBA	0.17	0.04	-0.49	2.47	1.76	1.73	2.17	2.06	2.76	2.51	15.18
Zenith	1.24	2.44	2.52	4.7	3.62	2.65	2.64	2.74	2.91	2.88	28.34
<b>Total</b>	<b>-14.09</b>	<b>20.92</b>	<b>-2.31</b>	<b>21.47</b>	<b>16.43</b>	<b>18.65</b>	<b>14.72</b>	<b>14.65</b>	<b>20.09</b>	<b>19.76</b>	<b>130.29</b>
<b>Geomean</b>	<b>-1.7613</b>	<b>2.615</b>	<b>-0.2888</b>	<b>2.68375</b>	<b>2.05375</b>	<b>2.3313</b>	<b>1.84</b>	<b>1.83125</b>	<b>2.51125</b>	<b>2.47</b>	<b>16.28625</b>

Table 2 shows an efficiency (EFF) cumulative max mean score of 16.286 by the quoted Deposit Money Banks in Nigeria with loan portfolio at risk coverage at 69%.in absolute figures. This implies that the average loan portfolio quality committed in DMBs is 0.69 to 1.0 within the period of the study. However, any bank that has an efficiency score equal to 100% is defined as fully efficient while a score of less than 100% is regarded as inefficient.

This suggests that generally, most Deposit Money Bank in Nigeria is inefficient in managing loan portfolio quality since 69% is still below the thresholds. Similarly, the table also indicates accumulative average of 130.2 leading to inefficiency scorecard of 16.2%. This suggests a wide dispersion of the data from the mean value because the mean value is higher than the efficiency scores, this strongly suggest that the data deviate from the normal output orientation Efficient Frontier by the DEA Model curve for the sample Banks.

### DEA Ranking Matrix

Table 3 presents the efficient ranking of sample deposit money bank where the relationship of the independent variables and the dependent variable are analyzed based on input- output outcome for the period of ten years for the individual Banks.

**TABLE 3: Summary of the DEA result**

Year/Bank	2018	AvR	EFF	RANK
Access	2.63	20.14	2.014	<b>3</b>
Fidelity	2.16	12.29	1.229	<b>6</b>
FCMB	2.23	11.31	1.131	<b>7</b>
First Bank	1.86	12.6	1.26	<b>5</b>
Guaranty	3.71	39.01	3.901	<b>1</b>
Union	1.78	-8.58	-0.858	<b>8</b>
UBA	2.51	15.18	1.518	<b>4</b>
Zenith	2.88	28.34	2.834	<b>2</b>
Total	19.76	130.29	13.029	
<b>Geomean</b>	<b>2.47</b>	<b>16.286</b>	<b>1.6286</b>	

Source: Dea Output 2020

The results in Table 3 reveals that deposit money banks absolute performance figures as set on the pages of financial statement differs significantly from their relative efficiency. The table indicates that the technical efficiency scores using DEA approach requires extension of desirable output by expansion and generating more quality loans with improved interest income to attain

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efficiency. The ranking reveals that Guaranty Trust Bank is the most efficient Deposit Money Bank in Nigeria followed by Zenith Bank and Access Bank coming third.

Therefore, the policy implication derivable from this finding is that, the board of quoted Deposit Banks in Nigeria should encourage lending to critical sectors as against margin lending with little impact on the loan portfolio quality. The findings also provide an evidence of rejecting the null hypothesis of the study that, loan portfolio quality has no significant effects on the efficiency of quoted Deposit Money Banks in Nigeria. This finding did not contradict the study's expectation because there is great potential to expand the interest income and total earning assets by rising from below the efficient frontier of 69% up to 100%. In testing the null hypothesis which states that prudential loan loss provisioning (LLP) has no significant impact on efficiency of quoted Deposit Money Banks in Nigeria. This finding explains that has no impact in any way on the efficiency of quoted Deposit Money Banks in Nigeria. First bank for instance has the highest LLP in the period under review yet rank 5<sup>th</sup> position. The finding did contradict the study's expectation because LLP serves as a buffer or reserves to cushion the effect of Bank financial stability although it impacts on profit margin.

Thus, the policy implication derivable from the finding of this study is, for the Board of quoted Deposit Money Banks in Nigeria to review loss provisions in line with regulated prudential guidelines to checkmate the management from manipulating accounting figures when preparing financial statement.

The findings provide an evidence of rejecting the third null hypothesis of the study which states that Capital adequacy (CA) has no significant effect on efficiency of quoted Deposit Money Bank in Nigeria.

However, the result is in line with reality of practice that, efficient deployment of resources has nothing to do with Bank size and capitalization. Therefore, the policy implication derivable from this finding is that, the board of quoted Deposit Money Banks in Nigeria should discourage undue dilution of equity interest in a bid to re- capitalize but channel more attention on resources utilization.

### CONCLUSION

This paper investigated loan portfolio quality provide by (loan portfolio value at risk (VaR), prudential loan loss provisioning (LLP), Capital adequacy and the efficiency of quoted Deposit Money Banks in Nigeria in terms of value added. It was found that, loan portfolio value at risk (VaR) have a negative effect on efficiency of quoted Deposit Money Banks in Nigeria, where the high quality loan portfolio is generated and well managed, the effect will be minimal, but otherwise it be damaging on the Banks earnings. It is therefore, recommended that, (1) the management and Board of quoted Deposit Money Banks in Nigeria should intensify efforts by encouraging quality loan portfolio and monitor every delinquency triggers in order to avoid bad loans and provisioning. In addition, (2) they should also strike a limit on dilution of equity and adhere strictly to regulatory guidelines on capitalization.

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