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CONTENTS

EFFICIENCY OF DEPOSIT MONEY BANKS IN NIGERIA: DATA ENVELOPMENT ANALYSIS APPROACH

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Abstract
In today's turbulent and competitive operating environment, the survival of banks depends on the efficient use of scarce resources. This study examines the efficiency of ten (10) selected banks in Nigeria for the period of five (5) years (2016 to 2020). The efficiency measures of constant return to scale (CRS), variable return to scale (VRS) and return to scale (RTS) were employed using the Data Envelopment Analysis (DEA) approach. The findings from empirical analysis show that only five banks, Guarantee Trust Bank (GTB), First City Monument Bank (FCMB,) Access bank, Union bank and Sterling bank were significantly efficient in Nigeria with respect to CRS and VRS for the period considered. However, all the banks were significantly efficient in the long run with respect to RTS. Therefore, the study recommends that the less efficient banks should study and understand the strategies adopted by the efficient banks. The study also recommends that investors/shareholders should invest more on the efficient banks such as GTB, FCMB, Access bank, Union bank and Sterling bank. Again, the study recommends that the inefficient banks like ZENITH, FIRST BANK, UBA and WEMA should be encouraged to focus more on long term project and explore ways to be more operationally efficient and move towards innovation. Regulatory authorities should ensure strict compliance to resources management policies.

Keywords: Efficiency, Banks, DEA, Input-Output
JEL Classifications: C14, C67, G21

I. Introduction
The goal of the financial sector is to mediate the economic and investment desires of financial units by reallocating assets among them (Banya and Biekpe, 2018). The banking sector being an essential part of the financial system performs an essential function in the mobilization and distribution of savings. Banks are involved in customers' most liquid asset (cash), and generally enhance the development of country's economy (Banya and Biekpe, 2018). The Nigeria banking system is not considerably different from the ones of other nations; since it is among the utmost significant contributors within the financial system playing an important role in the growth of Nigeria economy. Currently, well-developed financial markets and banking establishments are frequently taken into consideration to be a circumstance beneficial to economic growth (Diallo, 2018; Belke, Ulrich & Ralph, 2016; Zhang, Ling, Sheng & Na, 2016; Destefanis, Sergio, Christian & Lubrano, 2014; Balkevicius, 2012). As mediators, they strongly make contributions to the effective redistribution of assets in the market, fund company projects, therefore stimulate financial increase, sustain long-term

dealings with firms, and reduce the challenges of information asymmetry as well as alleviating economic instabilities (Grmanová & Ivanová, 2018).

In the current competitive environment, Nigerian banking sector offers a comprehensive financial services. For banking sectors in Nigeria, it is necessary to adequately considered operational economic of scale advantage with forward looking perception (Grmanová & Ivanová, 2018). The main contribution of the banks to a long-term plan is the evaluation of its roles from the viewpoint of performance and productivity. An advanced and proficiently operational banking system accelerates the improvement of other enterprise spheres within the country's economic system and consequently impacts the development of the whole nation (Ključnikov & Popesko, 2017; Kubiszewska, 2017; Nuhiu, Hoti & Bektashi, 2017). As asserted by Kubiszewska (2017), the current state of competitive atmosphere necessitates modifications in determining and managing economic factors. The primary standard is an adjustment from employing strictly financial determining factors to setting wider range of non-financial determining factors. Collection of variables and their evaluation are key aspects of banks financial management, which is expected to be consistent with its strategic desires as to performance and productivity with regards to the definite threats and structured boundaries. Therefore, banking sectors are now employing superior techniques of risk management in the organization and not necessarily because of the current supervisory treaty (Belás & Cipovová, 2012).

When evaluating its definite position, financial institution is making an attempt to accurately measure its strengths and flaws in the areas of pricing, products, communication policy, distribution, organization structure and management (Puriwat & Tripopsakul, 2017; Gąsiorowski, 2016). Hence, "the reason banks are involved in employing different techniques and seek to discover the most appropriate grouping of financial and non-financial determining factors to be employed in the direction of more evaluation. There are non-parametric and parametric techniques of efficiency evaluation. The frequently used technique in current banking sector is the non-parametric technique recognized as the Data Envelopment Analysis (DEA). This technique permits evaluating the efficiency of conversion of several inputs into multiple outputs with the help of efficiency score" (Aigbovo and Igbinoba, 2019:250). The major challenges confronting managers of banking institutions is the tendency to control inputs more than outputs since they are usually faced with the goal of generating maximum outputs with minimum resources (inputs). This necessitated the use of input-output approach to examines the efficiency of deposit money banks in Nigeria, using data envelopment analysis technique.

The extant literature shows that various studies have been done on efficiency in the banking industry (Diallo, 2018; Grmanová & Ivanová, 2018; Ključnikov & Popesko, 2017; Kubiszewska, 2017; Worimegbe & Benneth, 2019). Most studies investigated the technical, cost and profit efficiency applying non-parametric techniques consisting of the data envelopment analysis (DEA) and parametric techniques consisting of the stochastic frontier approach (SFA) to evaluate the different efficiency methods with conflicting results. These studies were carried out in the developed nations in the world such as the U.S, Europe and Asia countries. However, there are limited empirical studies in Nigeria using DEA approach in evaluating the efficiency of banks. Some studies such as Osamwonyi and Imafidon (2016), Fapohunda, Ogbeide and Igbinigie (2017), Obayagbona and Ogbeide (2018) focused on efficiencies of quoted manufacturing companies in Nigeria. However, studies by Eriki and Osifo (2015), Worimegbe and Benneth, (2019), Aigbovo and Igbinoba (2019), David, Isaac and Koye (2017) only considered one year. This current study differs from the above in that;

it does not only focus on the deposit money banks, but also have and extend scope of five (5) years (2016-2020). Hence, the objectives of this study is to evaluate the degree of efficiency of deposit money banks in the utilization of inputs to generate outputs Nigeria.

Whereas there is an increase in study on the subject, however what establish input and output of banks remains a controversy within the literature. Essentially, there are three methods in ascertaining bank input and output. Value added, user cost techniques and intermediation. Hence, total deposits (DPST) and debt (DEBT) are recognized as input variables, whereas total loans and advances (LAA) and net profit (NPRFT) as output variables.

The other sections of this paper are in the following order. Extant literatures were reviewed in section two while the research methods adopted for the study were discussed in section three. The presentation and interpretation of data analysis were covered in section four while section five contains the summary of major findings, recommendations and conclusion.

2. Literature Review

Parametric and non-parametric methods have been employed in analyzing banks efficiency. Portela and Thanassoulis (2005) viewed that efficiency in the banking industry can be measured from the profit point of view, transaction, and operations. Farrel (1957) considered productivity efficiency from the standpoint of technical and allocation of resources. Bank efficiency can also be measured in terms of cost and profit efficiency, as established by Thaguna and Poudel (2013). The main goals and objectives of bank managers are to seek ways of generating high profit despite the competition, increase customers' deposits and sales via increasing value-added operations. Worimegbe and Benneth, (2019) stated that bank managers concentrate their resources and operation on profit maximization, sales increase, increase customer base, and create new channels of effective distribution of bank products.

DEA is a technique for evaluating efficiency of the decision making unit (DMUs) employing linear programming techniques to enclose observed input-output vectors as firmly as feasible (Dyson, Thanassoulis & Boussofiane, 1991). DEA permits a couple of inputs-outputs to be measured on the equal time with none assumption on data distribution. In each case, performance is evaluated in line with a proportionate adjustment in inputs or outputs. DEA model can be segmented into input-oriented model which is capable of minimizing inputs at the same time satisfying at least the given output levels and output-oriented model which is capable of maximizing outputs without demanding more of any of the observed input values. According to Charnes, Cooper and Rhodes (1978: 435), "DEA models can be segmented into returns to scale by including weight constraints. initially suggested the efficiency measurement of the DMUs for constant returns to scale (CRS), where all DMUs are functioning at their optimum scale. There are also the variable returns to scale (VRS) efficiency measurement model which permit the segmentation of efficiency into technical and scale efficiencies in DEA".

Yao (2007) stated that data envelopment analysis (DEA) is a method for evaluating the comparative efficiency of peer decision making units (DMUs) with several inputs and outputs. Halim and Mevlut, (2013) stated that DEA is very important when measuring performance with the aim of making decision, therefore to understand our targets through the help of these decisions in commercial world. Data envelopment evaluation is equally a technique to evaluate the comparative efficiencies of a set of organizational unit which includes branches of banks or school when there are multiple in proportionate inputs and outputs (Cooper, Charnes & Rhodes, 1978).

Halim and Mevlut (2013) aver that DEA operate on the basis of multi inputs and outputs and it has accompanied a quick procedure in practice in addition to speedy theoretical enhancement. DEA is now been employed in determining technical productiveness of profit making inter companies which are in production and service sectors. There is always a constraint when analysing ratios of inputs and outputs of complicated organizations generating a number of outputs. It is not typically feasible to reach a sure end with these ratios. Thus, DEA is a substitute to inadequate techniques. DEA is an efficiency technique of evaluating without a parameter, developed for determining comparative events of economical decision units that appears to be the same, concerning the services or goods they produce (Halim & Mevlut, 2013).

This study relies on the production concept as advocated by Koutsoyianis (2003), which avers that production ability is a collection of inputs essential for the formation of one unit of output. Various approaches might be employed to produce a ware; however the generation technique as stated by Koutsoyianis (2003) combines a design work which communicates to a specialized connection associating factor sources of input as well as output. Regarding this study, the production concept holds that performance determining factors of macroeconomic - variable input sources could affect the efficiency (variable yield) of bank. Consequently, there is a practical correlation between bank and production. This study employed Cobb-Douglas production function to indicate the practical link between factor inputs and outputs (bank efficiency) in Nigeria. The Cobb-Douglas production function is indicated as;

$$Y = PC^{\alpha} B^{\beta} \qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad \text{i}$$

Where Y = Output
P = Total factor productivity
C= Capital
B = Labour
α and β = elasticity coefficients of capital and labour, respectively.
In the theoretical background, total deposits (DPST) and debt (DEBT) are recognized as input variables, while total loans and advances (LAA) and net profit (NPRFT) as output variables.

2.1 Empirical Review
Many researchers have attempted to answer the question of whether banks are operationally efficient through empirical investigations with mixed findings, which are highlighted below:

In developed economies, Halim and Mevlut (2013) examined efficiency depth with data envelopment analysis (DEA) in service industry and sampled 21 Turkish Banks. The study shows that thirteen Banks remained vigorous, whereas eighty of them existed lower than efficiency boundary and found dynamic organizations by analysing data extracted from CCR. Diallo (2018) studies bank efficiency and industry boom for the duration of financial crises using DEA approach. The study found that efficiency helps banks to be extra resistant to shocks, thus significantly affecting growth positively. Grmanová and Ivanová (2018) examined the banks efficiency in Slovakia employing DEA models. They find the leading three banks at Slovak national banking industry to be efficient in both years analysed.

Cakar, Koker and Narin (2021) study the prediction of the efficiency of four Turkish bank branches using neurotic fuzzy DEA approach. The prediction obtained from the analysis are more realistic using the contributions of bank managers for bank branches to remain opened or closed based on the efficiencies of each branch.

Novickyt and Droždz (2018) investigated Banking Sector performance in Lithuanian employing DEA approach from 2012 to 2016. The efficiency ranking was evaluated with a

non-parametric boundary input-oriented DEA technique with the variable return to scale (VRS) as well as the constant return to scale (CRS) rules. The study found out that the performance of Lithuanian banks examination centred on the VRS theory denotes that superior outcomes are demonstrated by the regional banks. The technical efficiency analysis founded on the CRS theory denotes parent group and the branches demonstrated higher efficiency than regional banks with success at working at the exact scale.

In Asia, Nand and Archana (2014) examined efficiency analysis of the Indian banking sector using DEA and found that DEA has the capacity to handle series of inputs and outputs and is suitable in unveiling connections that are concealed for other techniques. Other benefits of DEA are the ability to quantify for every evaluated unit and analyze sources of inefficiency. In Africa and emerging economies, Alfradi (2020) provides an analysis of the performance of seventeen Libyan banks from 2004 to 2010 using DEA technique. The findings indicated a positive relationship between bank efficiency and return on assets, risk and operating size. Jelassi and Delhoumi (2021) examine what determine the technical efficiency of the commercial banks operating in Tunisia from 1995 to 2017 using Data Envelopment Analysis. The results of the DEA show that bank technical efficiency increases with capitalization and inflation, it however decreases with size, bank branches and management to staff ratio.

Focusing on Nigeria, Eriki and Osagie (2015) investigated the determining factors of performance efficiency in 2009 and considered 19 selected banks in Nigeria. Variable returns to scale (VRS), constant returns to scale (CRS) and scale efficiency model were employed by using the Data Envelopment Analysis (DEA) method. The evaluation procedure was done employing DEA frontier software and found that bank age as well as bank size are positively correlated with bank performance efficiency, whereas board ownership structure as well as board independence are adversely linked to Nigeria bank performance efficiency.

Osamwonyi and Imafidon (2016) examined if Nigeria listed industrialized firms are functioning on the production possibility boundary, which is, if they are scale and technically efficient. Output orientated DEA was employed in the study with the input determining factors as total asset, operating expenses, cost of goods sold and shareholder's equity, while the output variables are return on equity, net profit, sales/turnover and return on asset. The 85% score of average variable return to scale and 76% scale efficiency mean score revealed the level of Nigeria listed manufacturing firms' efficiency. The analysis denotes that thirty-one firms out of the fifty-eight firms selected for the study are operating on production possibility boundary whereas the twenty-seven firms remaining are not.

David, Isaac and Koye (2017) investigated the performance of deposit money banks in Nigeria for the period of three years before, during and after the 2004–2005 consolidation. Using DEA and found that small banks have the tendency to be more cost efficient than average and large banks. Meanwhile, medium banks have the tendency to be more cost efficient than large banks, while large banks usually lead in cost efficiency score in post consolidation period. Cost efficiency of the banks was the highest all through consolidation, accompanied with the aid of pre-consolidation and least in 3 years after consolidation.

Worimegbe and Benneth, (2019) applied DEA to assess the influence of financial institutions efficiency on bank performance in Nigeria deposit money banks. Using a sample of fifteen (15) deposit money banks, they found that international banks are more transactional efficient in terms of operational efficiency relative to regional as well as national banks. Also, the international banks are more profit efficient relative to regional as well as national banks.

The empirical literatures above revealed that Diallo (2018), Halim and Mevlut (2013), Novickyt and Ivanova (2018) and Nand and Archana (2014) investigated the efficiency of service industry and banks in the developed countries. Osamwonyi and Imafidon (2016) examined the efficiency of quoted manufacturing companies in Nigeria while, Worimegbe and Benneth (2019), Eriki and Osagie (2015) and David, Isaac and Koye (2017) investigated the efficiency of banks in Nigeria. These studies considered one year. However, this present study examines the efficiency of banks in Nigeria employing data development approach (DEA) for the period of five years spanning 2015 to 2019.

3. Methodology

This study employed Data envelopment analysis (DEA) to investigate the efficiency of deposit money banks in Nigeria. The sample size of ten (10) banks was selected using convenience sampling techniques (availability and accessibility of data) for the period of five years 2016-2020. In this study, each bank employed in the sample is characterized as a DMU. DEA investigated the efficiency of the banks employing the various inputs they used to generate various outputs. A production boundary is said to symbolize the highest degree of output possible for a given level of inputs (Muhammad, 2011). "Consequently, a technically efficient bank might operate at the production boundary. That means it yields the highest outputs for a given level of inputs. The implication is that a bank technically inefficient might operate below the boundary. This is due to the fact that bank's output might be lower than the highest possible. Alternatively, financial institutions may be said to be technically efficient if it makes use of lowest inputs to provide a given level of outputs, and this suggests that where a financial institution employed more than the highest level of inputs it would be regarded as technically inefficient" (Aigbovo and Igbinoba, 2019).

DEA method was employed to analyse the data based on variable return to scale (VRS) constant return to scale (CRS), and return to scale (RTS). Therefore, we used Total Deposits (DPST) and debt (DEBT) as input variables, whereas total Loans and Advances (LAA) and Net Profit (NPRFT) as output variables. The data were obtained from Central Bank of Nigeria (CBN) 2020 audit of Nigerian Banks.

The Data Envelopment Analysis (DEA) Model

Aigbovo and Igbinoba, (2019:252) "Supposing each bank used in the sample is decision-making unit (DMU) and every one generating diverse outputs with x different inputs. Employing this relationship, we have the efficiency ratio model thus:

$$E_i = \frac{\sum_{i=1}^{k}}{\sum_{j=1}^{l}}$$

Where
E_i = relative efficiency of the DMU
k = number of outputs produced by the DMU
l = number of inputs used by the DMU
y_i = i th output produced by the DMU
x_i = j th input used by the DMU
u_i = k x l vector of output weights and
v_j = l x 1 vector of input weights.
i runs from 1 vector to k and j runs from 1 to l.

Decision Rule: A bank with a score of one (1) is efficient, while a score below one (1) means the bank is inefficient".

4. Results and Findings
Table I: Descriptive Statistics

	DEBT	DPST	LAA	NPRFT
Mean	30879158	4.87E+08	3.74E+08	15519939
Median	258021.5	3037572.	1619723.	89664.00
Maximum	3.02E+08	3.67E+09	2.48E+09	86159353
Minimum	0.000000	569116.0	338726.0	5182.000
Std. Dev.	67738548	8.21E+08	6.17E+08	28228731
Skewness	2.771193	1.833212	1.626586	1.564281
Kurtosis	10.03266	6.061974	4.716542	3.719247
Jarque-Bera	167.0341	47.53822	28.18677	21.46919
Probability	0.000000	0.000000	0.000001	0.000022
Sum	1.54E+09	2.44E+10	1.87E+10	7.76E+08
Sum Sq. Dev.	2.25E+17	3.30E+19	1.86E+19	3.90E+16
Observations	50	50	50	50

Source: Authors' computation, 2022
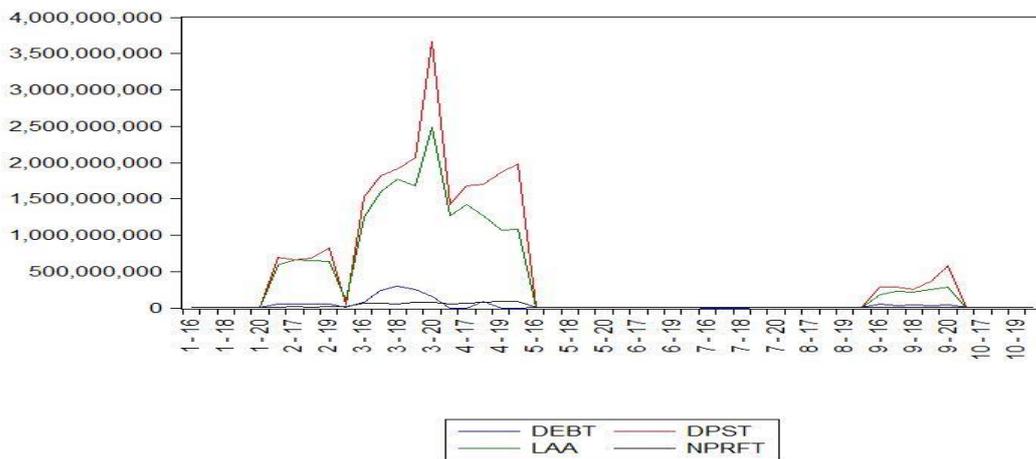
Figure I: Graphical analysis of the inputs and outputs data of sampled banks

From the Table I, the average (mean) value for DEBT, DPST, LAA and NPRFT respectively stood at 308, 4.8, 3.7 and 155. The median value of DEBT is 258 while that of DPST is 303. That of LAA and NPRFT is 162 and 896 respectively. Maximum value for DEBT, DPST, LAA and NPRFT respectively is 3.02, 3.6, 2.4 and 861. The minimum value for DEBT, DPST, LAA and NPRFT respectively stood at 0.00, 569, 338 and 518. The accompanying standard deviations are minimized at 677, 8.2, 6.1 and 282 respectively for DEBT, DPST,

LAA and NPRFT. The skewness result of 2.7 for DEBT, 1.8 for DPST, 1.6 for LAA and 1.5 for NPRFT are close to zero to indicate normal distribution of the variables. The Jaqua – Bera and probability results for DEBT, DPST, LAA and NPRFT of 167.0 and 0.000, 47.5 and 0.000, 28.1 and 0.000 and 21.4 and 0.000 confirms the absence of outlier in the observed data. The trends of the input and output data for the ten sampled banks from 2016 to 2020 is graphically analyzed and presented in Figure I

Test of Efficiency
The efficiency of ten (10) selected banks in Nigeria for the period of five years (2016 to 2020) was analysed using the DEA model. Below is the empirical result.

Table I1: DEA Result for Banks Efficiency

BANKS RTS	DMU	CRS_TE	VRS_TE	NIRS_TE	SCALE
FIDELITY 1.000000	dmu:13904	0.350861	0.356233	0.749240	0.984919
FIDELITY 1.000000	dmu:5457	0.402583	0.404947	1.000000	0.994163
FIDELITY 0.000000	dmu:17768	0.426440	0.426440	1.000000	1.000000
FIDELITY 0.000000	dmu:22926	0.373188	0.373188	0.871944	1.000000
FIDELITY 1.000000	dmu:28425	0.402927	0.571537	0.915395	0.704989
FCMB 1.000000	dmu:4760666	0.619352	0.857116	1.000000	0.722600
FCMB 1.000000	dmu:1_43e+07	0.691330	1.000000	1.000000	0.691330
FCMB 1.000000	dmu:8612978	0.659896	0.946746	1.000000	0.697014
FCMB 1.000000	dmu:1_50e+07	0.574587	0.797243	0.812876	0.720717
FCMB 0.000000	dmu:1_77e+07	1.000000	1.000000	1.000000	1.000000
ACCESS 1.000000	dmu:6_59e+07	0.657090	0.984635	0.994905	0.667344
ACCESS 1.000000	dmu:6_17e+07	0.487936	0.998567	1.000000	0.488636
ACCESS 1.000000	dmu:5_13e+07	0.472401	1.000000	1.000000	0.472401
ACCESS 1.000000	dmu:7_36e+07	0.475607	1.000000	1.000000	0.475607
ACCESS 1.000000	dmu:7_36e+07	0.572501	1.000000	1.000000	0.572501
GTB 0.000000	dmu:5_09e+07	1.000000	1.000000	1.000000	1.000000
GTB 0.000000	dmu:6_98e+07	1.000000	1.000000	1.000000	1.000000
GTB 1.000000	dmu:8_04e+07	0.592958	1.000000	1.000000	0.592958
GTB 0.000000	dmu:8_62e+07	1.000000	1.000000	1.000000	1.000000

GTB 1.000000	dmu:8_50e+07	0.932825	0.997476	1.000000	0.935186
ZENITH 1.000000	dmu:105663	0.671874	0.690155	0.766377	0.973511
ZENITH 1.000000	dmu:124252	0.645571	0.660008	0.779896	0.978127
ZENITH 1.000000	dmu:173791	0.421353	0.427809	0.557708	0.98490
ZENITH 1.000000	dmu:193424	0.350014	0.355074	0.425820	0.985748
ZENITH 1.000000	dmu:208843	0.904879	0.931476	0.904879	0.971446
FIRST BANK 1.000000	dmu:15148	0.088068	0.089531	0.122201	0.983663
FIRST BANK 1.000000	dmu:12243	0.090593	0.091923	0.140195	0.985532
FIRST BANK 1.000000	dmu:37708	0.131445	0.133097	0.212956	0.987585
FIRST BANK 1.000000	dmu:58232	0.160009	0.162138	0.209564	0.986871
FIRST BANK 1.000000	dmu:73665	0.143090	0.145057	0.153304	0.986437
UNION 1.000000	dmu:18035	0.753672	1.000000	0.753672	0.753672
UNION 1.000000	dmu:15885	0.869028	1.000000	1.000000	0.869028
UNION 1.000000	dmu:11239	0.689478	0.769664	1.000000	0.895816
UNION 1.000000	dmu:18438	0.506511	0.554908	0.537657	0.912783
UNION 1.000000	dmu:24375	0.623614	0.680409	0.658377	0.916527
UBA 1.000000	dmu:47642	0.353304	0.364688	0.453475	0.968783
UBA 1.000000	dmu:47541	0.332950	0.353580	0.595075	0.941654
UBA 1.000000	dmu:41396	0.268707	0.334852	0.979758	0.802466
UBA 1.000000	dmu:41047	0.215344	0.253597	1.000000	0.849157
UBA 1.000000	dmu:62750	0.233887	0.269173	1.000000	0.868909
WEMA 1.000000	dmu:2273205	0.305108	0.583173	1.000000	0.523186
WEMA 1.000000	dmu:2591800	0.503679	0.716702	0.901709	0.702773
WEMA 1.000000	dmu:2301158	0.454499	0.743520	1.000000	0.611280
WEMA 1.000000	dmu:3359259	0.448806	0.637510	0.737392	0.703998
WEMA 1.000000	dmu:5210748	0.375987	0.501317	0.536428	0.749999
STERLING 1.000000	dmu:10293	0.608667	0.691014	0.643840	0.880832

STERLING 1.000000	dmu:5182	0.778693	1.000000	1.000000	0.778693
STERLING 1.000000	dmu:7954	0.886070	0.994757	1.000000	0.890740
STERLING 1.000000	dmu:9468	0.541368	0.598246	0.854204	0.904926
STERLING 1.000000	dmu:10163	0.638930	0.691486	0.767278	0.923995

Source: Authors' compilations and computation, 2021 with STATA DEA Software

From table 1 above, the whole technical efficiency analysis founded on the constant returns to scale (CRS) show that only Guarantee Trust bank (GTB) and first city monument bank (FCMB) are efficient. However, GTB is more efficient as its three years out of five years considered are efficient, while FCMB is only efficient in the fifty year. The rest nine (9) banks are inefficient. The implication is that only GTB could effectively employ their input (debt and deposit) to generate adequate output (loan and advances and net profit). Though, FCMB was also able to utilized their input to generate output, but not as efficient as GTB.

The technical efficiency founded on the variable returns to scale (VRS) shows that FCMB is efficient in second and fifty years, Access bank is efficient in the third, fourth and fifth year, GTB is efficient in all the years except in the fifth year, Union bank is efficient only in the first and second year, while sterling bank is only efficient in the second year. The result shows that five banks are efficient, whereas the other five banks are inefficient. Two banks (GTB and Access Bank) out of the five (5) efficient banks considered are more efficient. However, the result denotes that FCMB, GTB, ACCESS BANK, UNION BANK AND STERLING are technically efficient, which implies that the five banks are able to employ their input variables to generate the desired output variables. Thus, other five banks (FIDELITY, ZENITH, FIRST BANK, UBA and WEMA) underutilized their resources (input) to generate the desired result (output).

Returns to scale efficiency (RTS) is the disparity or variation in output, which is the efficiency from a proportional upsurge of all the input. It also describes what happen to long run returns when the scale of production increases, as all input level comprising physical asset usage are variable. Hence, the return to scale efficiency result shows that all the banks are efficient. The implication is that all the banks have the capacity to convert variable inputs to desired output in the long run.

The study examines the efficiency of banks in Nigeria employing a sample of ten (10) selected banks for the period of five (5) years using the Data Envelopment Analysis (DEA) approach. The efficiency scores modes of CRS, VRS and RTS efficiency were adopted. The findings of this study reveal that not all the banks were significantly efficient. The result of constant return to scale (CRS) technical efficiency revealed that only GTB and FCMB were significantly efficient for the period considered. The variable return to scale (VRS) result shows that five banks (FCMB, GTB, ACCESS BANK, UNION BANK AND STERLING) were significantly efficient for the period considered. However, finding further revealed that the selected banks are efficient in the long run in Nigeria as indicated by the return to scale (RTS).

The implication of our findings based on CRS-TE and VRS-TE suggests that banks underutilized their inputs except FCMB, GTB, ACCESS BANK, UNION BANK AND STERLING. Furthermore, the result with respect to CRS, VRS and the number of years

considered shows that some banks were more efficient than other in this order; GTB with three (3) years of CRS efficiency and four (4) years VRS efficiency. FCMB was with one (1) year of CRS efficiency and two (2) years of VRS efficiency. Access bank was only efficient in terms of VRS for three (3) years. Similarly, Union bank was only efficient in terms of VRS for two years, while Sterling bank was only efficient in terms of VRS for one year. However, the implication of return to scale (RTS) findings suggests efficiency for all the banks in the long run when all variable inputs are fully employed.

5. Conclusion and Recommendations
The findings of this study denote that the sampled banks operate at different level and degree of efficiency during the period under consideration. While five banks (ZENITH, FIRST BANK, UBA and WEMA) were not efficient using CRS and VRS, except in the long run as indicated by the RTS, the other five (5) banks (FCMB, GTB, ACCESS BANK, UNION BANK AND STERLING) were significantly efficient as indicated by the CRS and VRS. However, all the banks were efficient in the long run as revealed by RTS. Therefore, the study recommends that the inefficient banks should understudy the strategies of the efficient banks and applied such strategies for them to move in the path of efficiency. Besides, investors/shareholders should invest more in the efficient banks such as GTB, FCMB, Access bank, Union bank and Sterling bank. Most importantly, all selected banks should be encouraged to focus more on long term project and explore ways to be more operationally efficient and move towards innovation. Regulatory authorities should ensure strict compliance to resources management policies and also formulating monetary policies that will improve the operational efficiency of banks at all time.

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