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Bank Consolidation and Scale Economies Trend of Banks in a Developing Country

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Abstract: This study provides a preliminary investigation of scale economies in banks over the period before, during and after bank consolidation in developing world using Nigerian case. It adopts the Data Envelopment Analysis (DEA) for computing scale economies scores of the stable identity banks in the country in 2001-2008. The results revealed that on average, more banks enjoy economies of scale in period of consolidation than in period of 3 years prior to consolidation and 3 years after consolidation. Further, more banks record economies of scale in the pre-consolidation era than in post-consolidation period. Although, the level of economies of scale over the period in the sector is promising, more banks recorded diseconomies of scale. Averagely, foreign banks are scale efficient than domestic banks.

Key words: Bank consolidation, scale economies, diseconomies of scale, scale efficiency, banks, Nigeria

INTRODUCTION

Bank consolidation is either individual bank promoted or policy-promoted. Individual bank promoted consolidation is always market induced. However, changes in the banking market can also prompt government to embark on policy induced consolidation. Individual firm promoted consolidation involves raising capital internally or on the stock exchange, if the firm is quoted on the stock exchange or engagement in a merger or acquisition to enlarge the business of the firm and achieve other management objectives without any government policy inducement to that effect.

Policy-promoted consolidation sets, the minimum capital criterion for banks which has become a powerful measure for the government to promote consolidation. Sawada and Okazaki (2004) posit that if a voluntary consolidation does not enhance the performance of the participant banks, any performance enhancing effect of the consolidation promoted by the government policy is more questionable. Advocates of bank consolidation believe that it would produce more efficient banks and healthier banking system less prone to bank failures (Mishkin, 2007). This is the too-big-to-fail syndrome. However, some believe that it may lead to a reduction in lending to small businesses and that banks rushing to expand into new geographic markets may take increased risks leading to bank failures (Mishkin, 2007).

According to Adedipe (2006), market-induced consolidation normally holds out promises of scale economies, gains in operational efficiency, profitability improvement and resource maximization. Prior empirical efforts are largely on test of existence of scale economies in banks whether small, medium or large roles of risks and quality factors on scale economies and test of existence of scale economies as one major economic force that drives large bank mergers. While most studies found potential or considerable scale economies in banks such as Osota (1995), Kasman (2002), Maggi and Rossi (2003) and Allen and Liu (2005), the congruence of findings on economies of scale in terms of size tend to favour small banks.

For instance, Osota (1995) find scale economies of banks to be decreasing with increases in bank size in Nigeria, Rao (2002) find small banks improving their scale economies at expense of large banks in United Arab Emirates. These results confirm to theoretic expectation that large firms tend to encounter coordination and supervision problems which can make them lose economies of size. Such scenario may be compounded if the big firm emanates from merger between a weak firm and/or set of sound firm (s) because such would increase credit risks (Shih, 2003).

It may be better if each firm merged or acquired are sound or they are weak altogether to avoid contagion risks, work culture disparity and complexity, communication hiccups and other internal oppositions. Noting the potency of risks, Altunbas *et al.* (2000) found that scale economies of banks are overstated when risks and quality factors are not incorporated.

Lee *et al.* (2008) have found scale efficiency improvement in Singaporean banks to emanate largely from merger among local banks. This present study identifies the gap in the literature concerning the trend of bank scale economies in an economy shortly before consolidation announcement during consolidation and

shortly after it. This inter-temporal investigation will provide preliminary knowledge on this gap for future and subsequent studies.

MATERIALS AND METHODS

Studies on scale economies in banks have used both parametric and non-parametric methods. The methods that have been mainly used in parametric approach were Stochastic Frontier Approach (SFA) also called Econometric Frontier Approach (EFA), Thick Frontier Approach (TFA), Distribution-Free Approach (DFA), Fixed-Effects model, Seemingly Unrelated Regressions (SUR) and dynamic OLS. On the other hand, the non-parametric researchers often used Data Envelopment Analysis (DEA), Malmquist index, Tornquist index and distance functions. While SFA is often used among the parametric approaches, DEA is widely used among the non-parametric methods. The widespread usage of DEA for examining scale economies is because it requires no explicit specification of functional form. It is practically difficult to parametrically specify and estimate a production or cost function for the banking business because deregulation and advances in technology have brought many outputs other than the traditional output-loans (Harada and Ito, 2005).

Also, DEA has the capacity to derive explicit scale economies for an individual firm, irrespective of sample size or time frame. So, the technique is better used when samples are small. However, its weakness over parametric methods is in terms of no estimated error on deviation from the frontier. DEA assumes that residual error against the frontier is zero.

The production, intermediation, asset, value added and user cost approaches are five main approaches used in the literature to conceptualize, the flow of services provided by banks in order to identify inputs and outputs. The production approach defines the bank activity as production of services for its customers. Deposits are counted as output and interests paid on deposits are not included in bank total costs (Ferrier and Lovell, 1990). According to this approach, input and output are measured in physical quantity (number of accounts, transactions processed, etc.). However, such detailed transactions flow data are typically proprietary and not generally available. The bank input consists of labour and capital and their costs are excluded since only physical inputs are needed to process transactions (Rao, 2002). The method can be modified hence modified production approach as in Berger and Humphrey (1992), Bauer *et al.* (1993) and Maggi and Rossi (2003). The specification may affect scale economies results, hence the need for testing alternative specification based on other approaches such as modified production, asset and value added. Under this approach, the interests paid on deposits are counted as input while the value of deposits is considered to be an output on the assumption that it is able to approximate the amount of services provided to customers. Following this approach, bank's output could comprise deposits, loans (performing and non-performing) and services, all expressed in monetary terms. The production approach may be somewhat better for evaluating the scale economies of branches of banks (Berger and Humphrey, 1997).

The intermediation approach views banks as intermediary between savers and investors. They collect funds from savers and allocate it to investors or borrowers in form of loans and other assets. Service flows are typically assumed to be proportional to the stock of financial values in the accounts such as the number of $ of loans, $ of deposits, etc. (Berger and Humphrey, 1992). The input of funds and their interest costs are included as input cost since funds are the main raw materials which are transformed in the financial intermediation process. Therefore, deposits are included among the inputs and interests in the total costs. This approach can also be modified to suit the development in the economy. Drake (2003) provided a modified form of the intermediation approach due to the observed behaviour that banks in United Kingdom in the 21st century have increasingly been generating more income from off-balance sheet operations and fee incomes. Consequently, a new category of other incomes and earning assets, namely loans and liquid assets plus investment can be categorized as output while capital, labour and total funds are inputs.

The asset approach is a variant of the intermediation approach where liabilities are considered as inputs and assets as output while the user cost approach assumes that it is the net contribution to the bank revenue that defines inputs and outputs in this case deposits are counted as outputs. Besides, the value added approach identifies any balance sheet item as output if it absorbs a relevant share of capital and labour, otherwise it is considered as an input or non relevant output. According to this approach, deposits are considered as output since they imply the creation of value. Further clarification is needed as Berger and Humphrey (1992) stated that produced deposits (i.e., demand and saving deposits) could be considered as outputs while purchased funds (i.e., fixed/time deposits) are considered as inputs. They argued that unlike produced deposits (deposits generated through the provision of liquidity, transactions and payment services to depositors), purchased funds are

acquired almost exclusively through interest payments. However the classification of demand and savings, deposits should be treated with caution. Osota (1995) argues that bank outputs should be measured by the value of their earning assets while other assets and liabilities are treated as inputs. After all, deposits (purchased or produced) are the sources of banks loanable funds.

The choice of a particular approach and consequently the definition used for the inputs and outputs are likely to affect the results of the scale economies estimates (Favero and Papi, 1995; Hunter and Timme, 1995; Resti, 1997). The researcher's choice is often a realistic compromise between theoretical considerations and data availability. This study adopts the modified intermediation in selecting the inputs and the outputs.

The inputs are deposits, labour and fixed assets and the outputs are performing loans and advances, short and long term investments and liquid assets. These data are obtained from annual audited financial reports of 15 deposit money banks in Nigeria out of the 24 banks operating in the country as at the period of this research. The foreign banks are those that their foreign owners constitute at least 50% of the total shareholders. Otherwise, they are domestic banks. The three foreign banks out of the sampled banks are Eco Bank Nigeria Plc, Standard Chartered Bank Nigeria Limited and Citi Bank Nigeria Limited which was initially called Nigeria International Bank Limited.

Given the consolidation of banks that took place in the country in July 2004 to December 2005, only these 15 banks could allow for consistent analysis over the period, 2001-2008. First, City Monument Bank Plc and Intercontinental Bank Plc were excluded because they did not have accounting information for 2001 and 2004, respectively due to alteration in accounting year. These banks shared >75% of the industry assets over the years. The figure is obtained from calculation using the sample data and Central Bank of Nigeria data. Also due to constant changes of accounting year by banks, some bank data covered period beyond 12 months these are prorated to 12 months except fixed assets to ensure consistency. The Central Bank of Nigeria has successfully enforced the uniform accounting year policy on banks operating in Nigeria and this took effect from December 31, 2010. Fixed asset figures are not performance variable but the value of fixed resources of the firm as at the close of the financial year.

Assumed are N inputs and M outputs for each of I banks. For the ith bank, these are represented by the column vector x_i and q_i, respectively. The N×I input matrix, X and the M×I output matrix, Q represent the data for all I banks. Using the duality in Linear programming, we specify three DEA models in Eq. 1-3 (Coelli *et al*., 2005). First is the constant return to scale DEA in Eq. 1:

$$\begin{aligned} &\text{Min}_{\Phi,\lambda}\,\Phi, \\ &\text{St} - q_i + Q\lambda \geq 0, \\ &\Phi x_i - X\lambda \geq 0, \ldots, \lambda \geq 0 \end{aligned} \tag{1}$$

The notation St stands for subject to. For the ith bank, the measured output slacks are equal to zero if $Q\lambda - q_i = 0$ and the measured input slacks are equal to zero if $\Phi x_i - X = 0$ (for the given optimal values of Ø and λ).

Where:
Ø = A scalar
λ = A I×1 vector of constants

The value of Ø obtained is the efficiency score for the ith bank. It satisfies; Ø≤1 with a value of 1 indicating a point on the frontier and hence a technically efficient bank (Farrell, 1957; Coelli *et al*., 2005). The Variable Return to Scale (VRS) DEA model is specified in Eq. 2:

$$\begin{aligned} &\text{Min}_{\Phi,\lambda}\,\Phi, \\ &\text{St} - q_i + Q\lambda \geq 0, \\ &\Phi x_i - X\lambda \geq 0, \ldots, \text{II}\lambda = 0, \\ &\lambda \geq 0 \end{aligned} \tag{2}$$

where, I1 is an I×1 vector of ones. This approach forms a convex hull of intersecting facet that envelope the data points more tightly than the CRS conical hull and thus provides technical efficiency scores that are greater than or equal to those obtainable using the CRS model (Coelli *et al*., 2005). The convexity constraint ($I1' \lambda = 1$) essentially ensures that an inefficient bank is only gauged against banks of similar size. This convexity restriction is not imposed in CRS case. In CRS DEA, a bank may be benchmarked against banks that are substantially larger (smaller) than it. In this instance, the λ weights sum to a value less than (greater than) 1.

Note that when the VRS option is specified, the DEA program conducts VRS, CRS and NIRS DEA and calculates scale efficiencies as well as technical efficiencies (Coelli *et al*., 2005).

A difference in CRS and VRS Technical Efficiency (TE) scores indicates the presence of scale inefficiency. In order to determine whether the bank is operating at constant to scale (scale efficient point) increasing return to scale (economies of scale) or decreasing return to scale (diseconomies of scale), an additional DEA problem with Non-increasing Returns to Scale (NIRS) can be imposed as in Eq. 3, if NIRS TE = VRS TE, the bank is operating under DRS and if the two are not equal, the

bank's economies of scale is IRS. However, if CRS TE = VRS TE, the bank's operation is CRS (Coelli *et al*., 2005):

$$\begin{aligned} &\text{Min}_{\Phi,\lambda}\,\Phi, \\ &\text{St} - q_i + Q\lambda \geq 0, \\ &\Phi x_i - X\lambda \geq 0, \ldots, \text{ II } \lambda \leq 1, \\ &\lambda \geq 0 \end{aligned} \tag{3}$$

The difference between Eq. 2 and 3 is that $I1'\lambda = 1$ restriction in Eq. 2 is now substituted with $I1'\lambda \leq 1$ which ensures that the ith bank is not guaged against banks that substantially larger than it but may be compared with banks smaller than it.

RESULTS AND DISCUSSION

In 2001, six banks out of the banks were found to be scale efficient that is operate at constant return to scale and another 6 banks were found to operate at decreasing return to scale or simply means they experienced diseconomies of scale (Table 1). The remaining three banks enjoyed economies of scale, meaning that they operated at increasing return to scale. Similar results were found in 2002 and 2003 (Table 2 and 3). Therefore, in the pre-consolidation periods (2001-2003), 18 (40%) observations were for scale efficiency, 18 (40%) observations were for diseconomies of scale and 9 (20%) observations were for economies of scale. However, during the consolidation periods (2004-2005), the value of observations for the diseconomies of scale reduced to 33.33%, economies of scale observations increased to 26.67% while scale efficiency observations remain 40% representing 10, 8 and 12 observations, respectively.

Specifically in 2004, five banks experienced scale efficiency, four banks were faced with diseconomies of scale and six banks experienced economies of scale. Whereas in 2005, seven banks were scale efficient, six banks were faced with diseconomies of scale and only two banks enjoyed economies scale (Table 4 and 5).

Comparatively, the results of the post-consolidation periods (2006-2008) were worse. The value of observations with diseconomies of scale increased to 48.89%, scale efficient observations reduced to 33.33% and that of economies of scale also fell to 17.78%, representing 22, 15 and 8 observations, accordingly. Specifically, eight banks operated at diseconomies of scale, six banks were scale efficient and only one bank enjoyed economies of scale in 2006. In the succeeding year, nine banks operated at diseconomies of scale, five banks were scale efficient and only one bank enjoyed economies of scale. In 2008, five banks were faced with diseconomies of scale, four banks experienced scale efficiency and six banks enjoyed economies of scale (Table 6-8). In all the 120 observations for the 8 years,

Table 1: Economies of scale of the deposit money banks in 2001

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	0.673	0.984	0.683	DRS
First Bank of Nigeria Plc	0.980	1.000	0.980	DRS
United Bank for Africa Plc	1.000	1.000	1.000	CRS
Zenith Bank limited	1.000	1.000	1.000	CRS
Access Bank Plc	0.977	1.000	0.977	IRS
Wema Bank Plc	0.821	0.903	0.909	DRS
Guaranty Trust Bank Plc	1.000	1.000	1.000	CRS
Oceanic Bank International Limited	1.000	1.000	1.000	CRS
Equatorial Trust Bank Limited	0.862	0.880	1.000	IRS
Afribank Plc	0.704	0.881	0.799	DRS
Diamond Bank Limited	0.830	0.936	0.887	DRS
Fidelity Bank Plc	0.695	0.702	0.991	DRS
Ecobank Nigeria Plc	0.711	0.726	0.980	IRS
Standard Chartered Bank Limited	1.000	1.000	1.000	CRS
Citibank Nigeria Limited (formerly known as Nigeria International Bank Limited	1.000	1.000	1.000	CRS
Mean	0.884	0.934	0.946	-

Researcher's computation using DEAP Version 2.1. CRSTE = Technical efficiency from CRS DEA; VRSTE = Technical efficiency from VRS DEA; SCALE = Scale efficiency = CRSTE/VRSTE DRS = Decreasing Return to Scale; IRS = Increasing Return to Scale; CRS=Constant Return to Scale; DEAP = Data Envelopment Analysis (computer) Program

Table 2: Economies of scale of the deposit money banks in 2002

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	0.747	1.000	0.747	DRS
First Bank of Nigeria Plc	0.991	1.000	0.991	DRS
United Bank for Africa Plc	0.681	1.000	0.681	DRS
Zenith Bank Limited	1.000	1.000	1.000	CRS
Access Bank Plc	1.000	1.000	1.000	CRS
Wema Bank Plc	0.793	0.826	0.960	DRS
Guaranty Trust bank Plc	1.000	1.000	1.000	CRS
Oceanic Bank International Limited	1.000	1.000	1.000	CRS
Equatorial Trust bank limited	0.886	0.890	0.972	IRS
Afribank Plc	0.710	0.866	0.820	DRS
Diamond Bank Limited	0.836	0.861	0.971	DRS
Fidelity Bank Plc	0.677	0.951	0.712	IRS
Ecobank Nigeria Plc	0.751	0.813	0.923	IRS
Standard Chartered Bank Limited	1.000	1.000	1.000	CRS
Citibank Nigeria Limited	1.000	1.000	1.000	CRS
Mean	0.870	0.947	0.919	-

Researchers computation using DEAP Version 2.1

Table 3: Economies of scale of the deposit money banks in 2003

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	0.919	1.000	0.919	DRS
First Bank of Nigeria Plc	0.913	1.000	0.913	DRS
United Bank for Africa Plc	0.762	1.000	0.762	DRS
Zenith Bank Limited	0.986	1.000	0.986	DRS
Access Bank Plc	1.000	1.000	1.000	CRS
Wema Bank Plc	0.839	0.839	1.000	CRS
Guaranty Trust Bank Plc	1.000	1.000	1.000	CRS
Oceanic Bank International Limited	1.000	1.000	1.000	CRS
Equatorial Trust Bank Limited	0.838	0.846	0.991	IRS
Afribank Plc	0.714	0.731	0.978	DRS
Diamond Bank Limited	0.681	0.714	0.953	DRS
Fidelity Bank Plc	0.710	0.925	0.768	IRS
Ecobank Nigeria Plc	0.708	0.745	0.950	IRS
Standard Chartered Bank Limited	1.000	1.000	1.000	CRS
Citibank Nigeria Limited	1.000	1.000	1.000	CRS
Mean	0.871	0.920	0.948	

Researchers computation using DEAP Version 2.1

Table 4: Economies of scale of the deposit money banks in 2004

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	1.000	1.000	1.000	CRS
First Bank of Nigeria Plc	0.993	1.000	0.993	DRS
United Bank for Africa Plc	0.899	0.938	0.959	DRS
Zenith Bank Plc	0.932	1.000	0.932	DRS
Access Bank Plc	0.848	1.000	0.848	IRS
Wema Bank Plc	1.000	1.000	1.000	CRS
Guaranty Trust Bank Plc	1.000	1.000	1.000	CRS
Oceanic Bank International Plc	0.823	0.876	0.940	DRS
Equatorial Trust Bank Limited	0.915	0.968	0.944	IRS
Afribank Plc	0.698	0.705	0.990	IRS
Diamond Bank Limited	0.868	0.889	0.976	IRS
Fidelity Bank Plc	0.892	1.000	0.892	IRS
Ecobank Nigeria Plc	0.830	0.900	0.923	IRS
Standard Chartered Bank Limited	1.000	1.000	1.000	CRS
Citibank Nigeria Limited	1.000	1.000	1.000	CRS
Mean	0.913	0.952	0.960	-

Researchers Computation Using DEAP Version 2.1

Table 5: Economies of scale of the deposit money banks in 2005

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	1.000	1.000	1.000	CRS
First Bank of Nigeria Plc	0.768	1.000	0.768	DRS
United Bank for Africa Plc	0.826	0.833	0.991	DRS
Zenith Bank Plc	0.815	1.000	0.815	DRS
Access Bank Plc	0.738	0.845	0.873	IRS
Wema Bank Plc	0.937	0.938	0.999	DRS
Guaranty Trust Bank Plc	1.000	1.000	1.000	CRS
Oceanic Bank International Plc	1.000	1.000	1.000	CRS
Equatorial Trust Bank Limited	0.763	0.771	0.990	IRS
Afribank Plc	0.703	0.731	0.962	DRS
Diamond Bank Limited	0.802	0.814	0.984	DRS
Fidelity Bank Plc	1.000	1.000	1.000	CRS
Ecobank Nigeria Plc	1.000	1.000	1.000	CRS
Standard Chartered Bank Limited	1.000	1.000	1.000	CRS
Citibank Nigeria Limited	1.000	1.000	1.000	CRS
Mean	0.890	0.929	0.959	-

Researchers computation using DEAP Version 2.1

50 (41.67%) are for diseconomies of scale, 45 (37.50%) are for scale efficiency and 25 (20.83%) are for economies of scale. This means that there was a high proportion of diseconomies of scale in the banking sector in 2001-2008. This might be as a result of the difficulty of efficiently controlling and coordinating the banks operations as they became relatively large.

Osota (1995) found similar result that scale economies decrease with increase in bank size in Nigeria. However, the 20.83% of banks having economies of scale is a potential achievement in the industry. This result is in line with previous studies such as Kasman (2002) for Turkey, Maggi and Rossi (2003) for US and Europe and Allen and Liu (2005) for Canadian banks.

Different from past studies, the results show that banks in Nigeria perform most in terms of scale economies during consolidation periods follow by pre-consolidation periods and perform least in post consolidation periods.

Table 6: Economies of scale of the deposit money banks in 2006

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	1.000	1.000	1.000	CRS
First Bank of Nigeria Plc	0.784	1.000	0.784	DRS
United Bank for Africa Plc	0.958	1.000	0.958	DRS
Zenith Bank Plc	0.730	1.000	0.730	DRS
Access Bank Plc	0.866	1.000	0.866	DRS
Wema Bank Plc	0.588	0.589	1.000	CRS
Guaranty Trust Bank Plc	0.694	1.000	0.694	DRS
Oceanic Bank International Plc	1.000	1.000	1.000	CRS
Equatorial Trust Bank Limited	0.706	0.775	0.911	DRS
Afribank Plc	0.886	0.932	0.951	IRS
Diamond Bank Plc	0.712	0.963	0.740	DRS
Fidelity Bank Plc	0.888	0.888	1.000	CRS
Ecobank Nigeria Plc	0.937	1.000	0.937	DRS
Standard Chartered Bank Limited	1.000	1.000	1.000	CRS
Citibank Nigeria Limited	1.000	1.000	1.000	CRS
Mean	0.850	0.943	0.905	-

Researchers computation using DEAP Version 2.1

Table 7: Economies of scale of the deposit money banks in 2007

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	0.918	1.000	0.918	DRS
First Bank of Nigeria Plc	1.000	1.000	1.000	CRS
United Bank for Africa Plc	0.821	1.000	0.821	DRS
Zenith Bank Plc	0.773	0.965	0.801	DRS
Access Bank Plc	1.000	1.000	1.000	CRS
Wema Bank Plc	0.729	0.951	0.767	DRS
Guaranty Trust Bank Plc	0.788	1.000	0.788	DRS
Oceanic Bank International Plc	1.000	1.000	1.000	CRS
Equatorial Trust Bank Limited	0.722	0.743	0.971	DRS
Afribank Plc	0.696	0.740	0.940	DRS
Diamond Bank Plc	0.750	0.847	0.886	DRS
Fidelity Bank Plc	0.727	0.754	0.965	IRS
Ecobank Nigeria Plc	0.846	0.912	0.927	DRS
Standard Chartered Bank Limited	1.000	1.000	1.000	CRS
Citibank Nigeria Limited	1.000	1.000	1.000	CRS
Mean	0.851	0.927	0.919	-

Researchers computation using DEAP Version 2.1

Table 8: Economies of scale of the deposit money banks in 2008

Banks	CRSTE	VRSTE	Scale	Notation
Union Bank of Nigeria Plc	0.670	0.704	0.951	DRS
First Bank of Nigeria Plc	0.934	1.000	0.934	DRS
United Bank for Africa Plc	0.452	1.000	0.452	DRS
Zenith Bank Plc	0.813	1.000	0.813	DRS
Access Bank Plc	1.000	1.000	1.000	CRS
Wema Bank Plc	0.809	1.000	0.809	IRS
Guaranty Trust Bank Plc	1.000	1.000	1.000	CRS
Oceanic Bank International Plc	0.785	0.794	0.988	DRS
Equatorial Trust Bank Limited	0.680	1.000	0.680	IRS
Afribank Plc	0.593	0.695	0.853	IRS
Diamond Bank Plc	0.687	0.702	0.979	IRS
Fidelity Bank Plc	1.000	1.000	1.000	CRS
Ecobank Nigeria Plc	0.418	0.472	0.886	IRS
Standard Chartered Bank Limited	0.842	1.000	0.842	IRS
Citibank Nigeria Limited	1.000	1.000	1.000	CRS
Mean	0.779	0.891	0.879	-

Researchers computation using DEAP Version 2.1

Besides, the three foreign owned banks representing 20% of the sampled banks recorded 15 observations of scale efficiency out of the 45 observations of scale efficiency

over the 8 years. Proportionately, on average, 66.67% observations of scale efficiency are for foreign banks while 33.33% observations are for domestic banks. Therefore, foreign banks are more scale efficient than domestic banks.

CONCLUSION

This study shows that bank consolidation and other financial sector reforms are germane toward raising scale efficiency in the banking sector. However, the monetary regulatory authorities will need to increase their oversight functions on banks when consolidation is completed because of increasing tendencies of scale inefficiency after this period.

Finally, foreign banks participation in banking industry of developing countries, especially from developed countries is enviable for competitiveness and efficiency in the industry.

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