

The Structure of the Nigerian Banking Sector and its Impact on Bank Performance.

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Abstract

This paper attempts to measure the market structure and competition in the consolidated Nigerian banking industry, as well as investigated the impact of the banking sector structure on bank performance. A time-series regression analysis was applied to a ten-year data period (2001-2010) to evaluate the relationship and the impact of banking sector structure, other explanatory variables on bank performance. Significant findings include that the Nigerian banking sector is oligopolistic in structure and that market concentration positively and significantly impacts on bank performance. These results suggest that market concentration is a major determinant of bank profitability in Nigeria. The structure of the Nigerian banking sector and thus the performance of banks may be improved if the sector is allowed to exploit the synergistic effect of market-induced consolidation.

Keywords: Concentration; banking sector structure; relationship; performance.

1. Introduction

The degree of banking competition and its association with market concentration is always a subject of some controversy. It is a more relevant issue now than in earlier times and of vital importance for welfare-related public policy toward market structure and conduct in the banking industry (Shaffer, 2004). These two tendencies (competition and concentration) seem to contrast each other if we accept the theoretical proposition that a more concentrated market implies a lower degree of competition due to undesirable exercise of market power by banks. There are also more general reasons why the market conditions in the banking industry deserve particular attention. The soundness and stability of the financial sector may in various ways be influenced by the degree of competition and concentration (Yeyati and Micco, 2003).

From a theoretical point of view, competition may have an uncomplimentary impact on stability if it causes banks' charter value to drop, thus reducing the incentives for prudent risk-taking behavior. According to this view, the promise of extraordinary profits associated with the presence of market power reduces the agency problem of limited liability banks, namely, their propensity to gamble. Stiffer competition, instead, could lead to more aggressive risk taking, as documented in some empirical studies (Keeley, 1990; Cerasi and Daltung, 2000). On the other hand, a more concentrated system, in-as-much as it implies the presence of a few relatively large banks, is more likely to display a "too big to fail" problem by which large banks increase their risk exposure anticipating the unwillingness of the regulator to let the bank fail in the event of insolvency problems (Hughes and Mester, 1998). Moreover, competition in the banking industry, given the dominant role of banks in most countries, may have an impact on the likely effectiveness of monetary policy. A more monopolistic banking sector is able to obtain larger interest rate margins. Monopolistic pricing by banks will not transmit changes of central bank interest rates as fully as pure competitive pricing will do. This probably hampers monetary policy at least to some extent (Lensink and Sterken, 2002). Moreover, Kashyap and Stein (1997) and Cecchetti (1999) argue that the banking system's concentration and health are essential to the analysis of the effectiveness of monetary policy. According to these authors smaller banks are more likely to reduce lending in case of a monetary contraction, due to their weaker balance sheet structure and poorer ability to attract reasonably priced external funds. Countries with a high concentration ratio (a relatively large fraction of bigger banks) would be

affected less by the credit channel.

With regard to banking markets, Gilbert (1984) concludes in an early review of the empirical literature that the economic significance of market concentration by banks before deregulation was very difficult to assess, not least because of the poor quality of much of the empirical research. More recently, Shaffer (1992) summarizes the (lack of) current consensus by stating that the degree to which banking market structure matters for competition and performance is “a hotly debated topic.” Consequently, the link between higher prices and higher profitability usually is viewed as an empirical question. To judge the implications of those developments, it is necessary to assess the current market structure of the banking industry, to record the degree of competition, and to investigate the impact of concentration on the market structure and the behavior of banks. This paper seeks to measure the degree of concentration and competition in the now consolidated Nigerian banking landscape and investigate competitive conditions in the Nigerian banking markets over the period 2001-2010. It is the purpose of this work to measure the structure of the Nigerian banking sector and its impact on performance.

The rest of the paper is divided into four sections. Section 2 highlights the empirical review of related literature. Methodological issues are the concern of section 3. Section 4 is devoted to analysis of results and section 5 concludes the paper.

2. Review of Related Literature.

Studies on the relationship between the structure elements of the banking industry and its impact on performance have not been conclusive. Many factors influence the direction of conclusions on such a relationship. Examples include the types and number of independent variables chosen by the researcher which he conceives as the main determinants of performance, the availability of data on some variables in some countries or industries, the amenableness of variables to quantification, the length of period covered in the research and the extent of multicollinearity among the independent variables. This relationship presumes that measures of banking market structure, including measures of market concentration, are good indicators of the intensity of competition that occurs (“conduct”) (Scherer and Ross, 1990). The intensity of competition influences the price for financial services, which are, in turn, assumed to determine firms’ profits (“performance”). Numerous banking studies demonstrate statistical relationships that are consistent with some aspects of this relationship, at least in a static context (see Berger and Hannan, 1989; Neumark and Sharpe, 1992; Hannan, 1997; Prager and Hannan, 1998; Amel and Hannan, 1998). With this framework, it is assumed that measurements of market structure and concentration can provide reliable inferences regarding the extent of competition or conduct in an industry. The extent of competition affects the price that consumers pay for the industry services, which determines the level of profits and performance for the industry. On the other hand, some evidence is inconsistent with the predictions of this framework. Moreover, some of the evidence that is consistent with the predictions of this paradigm is subject to a different interpretation. For example, the link between market structure and profitability may be spurious in the sense that an important variable is omitted. Some firms may have large market shares simply because their costs are lower than those of their competitors. A number of other studies cast doubt on this relationship. There is also theoretical criticism of the relationship originally put forward by Demsetz (1973) and more recently by Berger (1995) – that larger market shares may be the result of better efficiency and lower costs. The basic argument is that if higher profits are derived from greater efficiency, then adverse welfare costs, which this relationship predicts as the result of higher prices, do not arise. This framework is primarily an empirical approach, which is often applied without direct reference to theoretical models of competition. In other words, the link, which may or may not exist between higher prices and higher profitability, is considered to be an empirical issue. Yet, it is because of this reason that this framework is theoretically debatable. Some theorists also argue that the existence of higher concentration may indeed lead to higher prices, and result in lower demand, but this need not result in higher profits for a highly concentrated industry. Baumol (1982) argue further that in contestable markets (free entry and exit) profits are likely to approximate zero, even in the presence of oligopolistic competition.

Bhatti and Hussain (2010) examined the relationship between market structure and performance in the banking sector using data from Pakistani commercial banks. With a sample of 20 scheduled commercial banks incorporated in Pakistan (Bhatti and Hussain, 2010) examined the relationship using the annual and pooled data for a period of 9 years from year 1996-2004. Three measures of bank’s performance were utilized: return on assets (ROA), return on capital (ROC) and return on equity (ROE). They used concentration ratio (CR) to measure structure-conduct-performance (SCP) hypothesis and market share to measure efficient-structure (E-S) hypothesis. They also used control variables to capture market specific characteristics such as bank size, market

size, risk to owners, liquidity measure, market risk, and market growth. Using regression analysis, they found a positive relationship between concentration ratio (CR) and profitability while market share (MS) which is used for efficient structure (E-S) hypothesis yielded a negative relationship with profitability. In light of these result, they concluded that there is a positive relationship between profitability and concentration therefore, that that market concentration determines the profitability in Pakistani commercial banks while concluding that there is a negative relationship between competition and profitability in the Pakistani commercial banks.

Chirwa (2003) investigated the relationship between market structure and profitability of commercial banks in Malawi using time series data between 1970 and 1994. They used time-series techniques of co-integration and error-correction mechanism to test the collusion hypothesis to find out whether a long-run relationship exists between profits of commercial banks and concentration in the banking industry. Chirwa (2003) provided definition, measurement and descriptive statistics for the variables which are used in his regression analysis. He concluded that a long-run relationship exist between profitability and concentration, capital-asset ratio, loan-asset ratio, assets, demand deposits-deposits ratio, market deposits and market growth, in commercial Malawian banks. The relationship between commercial bank profits and concentration is positive and its coefficient is statistically significant at the 5% level in all specifications. The results show that a long-run relationship exists between profitability and market structure in Malawian banking. The collusion hypothesis is strongly supported by the positive and significant relationship between commercial bank profitability and concentration in Malawi.

Molyneux and Forbes (1995) measured market structure and performance in 18 European countries for the four year period 1986-89 to test the two hypotheses S-C-P and E-S, using pooled and annual data. They suggested that if the SCP paradigm is found evident in European markets, this would imply that antitrust or regulatory policy should be aimed at changing market structure in order to increase competition or the quality of bank performance, and if the efficiency hypothesis is found, then increasing concentration in banking markets should not be restricted by antitrust or regulatory measures. The return on assets (ROA) was used as bank performance measure. The independent variables include both market specific and firm-specific variables. Ten-firm concentration ratio (CR₁₀) was used as a measure of market structure and market share measure (MS) to capture firm efficiency. A number of control variables were included to account for other risk, cost, size and ownership characteristics. Their result supported the traditional SCP approach. Their result also shows that concentration in the European banking market lowers the cost of collusion between firms.

Bamakhramah (1992) studied the major features of banking structure in Saudi Arabia. The study includes resource (deposits) concentration, new bank entry barriers, bank branching, and product differentiation. Bamakhramah (1992) attempts at measuring the above features, particularly resource concentration in the banking sector of Saudi Arabia and then utilizes the statistical tools of correlation and multiple regression to estimate the relationship between the main features of banking structure and the major indicators of bank performance, significant among which is profitability. Statistically Bamakhramah (1992) observed significant relationships especially in the ratio of demand deposits to total deposits. Also, he observed a negative correlation between the concentration level and profitability rates in the banking system of Saudi Arabia.

3. Methodological Framework.

Return on asset (ROA) was used as the major metric for measuring profitability. The data set covers a 10-year period from 2001 to 2010. Data were mainly obtained from the Central Bank of Nigeria statistical bulletin and various year end annual reports of the Central Bank of Nigeria. These aided authors' computation of some of the operational variables.

To measure the relationship between structure (market concentration), other explanatory variables and its impact on profitability, a time-series regression analysis was adopted. The functional form of the regression equation adopted is the linear equation (model) as applied by (Bamakhramah, 1992) as well as (Bamakhramah, 1992 citing Agu, 1970; Fraser and Roce, 1971; and Borke, 1989). The regression equation, thus, takes the following form:

$$PA = a_0 + a_1 DD/TD + a_2 FA/TA + a_3 NB + a_4 NBB + a_5 \text{Log}_{10} TD + a_6 CR \dots \dots \dots (1)$$

Where:

PA : Profitability measured by ROA (the dependent variable).

The independent (explanatory) variables are:

CR : The Concentration Index (Concentration Ratio in terms of deposit).

Log_{10TD} : Total Deposits (measuring market demand).

DD/TD : The ratio of Demand Deposits to Total Deposits for the banking sector.

NBB : Number of Branches for the banking sector (as a measure for branching).

FA/TA : The ratio of Foreign Assets to Total Assets, measuring foreign exposure.

NB : The Number of Banks

a_1 : The constant term and a_1 - a_6 represent the relevant parameters for the above independent variables.

Profitability was primarily measured by Return on Assets (ROA). ROA shows the profit earned per Naira of assets which reflects bank's management ability to utilize the bank's financial and real investment resources to generate profits (Naceur, 2003). The ROA, a functional indicator of bank's profitability is calculated by dividing net income by total assets.

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Total Assets}} \dots \dots \dots (2)$$

3.1. Independent variables.

The main factors influencing the level of performance of the Nigerian banks are follows:

The market concentration of the Nigerian banking industry: This independent variable acts as the main indicator of the banking structure which affects performance. The most widely used measures of concentration in literature are: the concentration ratio, the Lorenz curve (measured by the Gini coefficient) and the Herfindahl-Hirschman Index (widely known as the Herfindahl Index). Concentration ratio is simply a measure of the total output produced in an industry by a given number of firms in the industry. Concentration ratios are usually used to show the extent of market control of the largest firms in the industry and to illustrate the degree to which an industry is oligopolistic (Wikipedia, 2011). This paper adopted a CR_{10} concentration ratio measuring the total market share of the ten largest firms in the Nigerian banking industry in terms of total asset. The numerical representation of a ten-firm concentration ratio is:

$$C_{10} = \frac{\sum_{n=1}^{10} d_n}{D} \dots \dots \dots (3)$$

where:

C_{10} = The ten firm concentration ratio,

n = The number of firms,

d_n = The deposits (size) of the n th firm,

D = Total deposits (size) of the industry.

The concentration ratio is simple and easy in terms of calculation and data requirement. Its usage is convenient when the number of units in the sector is huge as it is in Nigeria with currently twenty two banks in operation. In addition, the concentration ratio treats all the firms chosen in the measurement equally in terms of the weight they carry in the index. The ten largest banks included in the concentration index are as posited by the Central Bank of Nigeria in its various yearly annual reports.

Total Market Deposits: Total market deposits are included as another control variable to measure size of the market. Market entry is easier in larger markets as compared to smaller markets as customers in large markets are sophisticated and less traditional (Bamakhramah, 1992).

The ratio of demand deposits to total deposits is expected to exert a noticeable influence on the profitability of Nigerian banks. Since demand deposits are acquired almost freely by the commercial banks and because large portions of the liquidity with the public are deposited in the form of demand deposits, this situation enables banks to accumulate funds which they can utilize for lending or investment without payment of the cost of attainment of a considerable part of such funds (Bamakhramah, 1992).

$$\text{Ratio of Demand Deposit to Total Deposit (DD/TD)} = \frac{\text{Demand Deposit}}{\text{Total Deposit}} \dots \dots \dots (4)$$

The degree of foreign exposition: The degree of foreign exposition of banks and participation in foreign operations is also an explanatory variable. Such an exposition relieves the banks from the limitations of the local market absorptive capacity. Foreign markets, particularly offshore ones offer local banks wide outlets and the opportunity to diversify and enter into new types of business not usually accessible or profitable in the local market. Foreign market exposition or participation by Nigerian banks is measured by the ratio of foreign assets belonging to Nigerian banks to total assets with the banking sector (Bamakhramah, 1992).

$$\text{Degree of Foreign Exposition (FA/TA)} = \frac{\text{Foreign Assets}}{\text{Total Assets}} \dots\dots\dots(5)$$

Number of Banks (NB): As the main component of barriers to entry, bank regulation is considered a major dimension of banking structure. Its significance stems from its effect on the bank concentration level and, thus, on the competition among the banking units and hence on the behavior and performance of such units. The most important type of bank regulation in Nigeria which is relevant to banking structure is capital regulation. This regulation is normally exercised by the Central Bank of Nigeria. Regulations exert considerable influence on the number and size of bank units, which are the most dominant ingredients in the measurement of concentration. The 2005 bank consolidation exercise in Nigerian was a milestone in the history of the Nigerian banking sector which affected greatly the number of banks (a reduction from 89 banks to 25) operating in Nigeria as well as its structure and performance. The number of Nigerian banks in each year during the period of the study is added as an independent proxy to test the impact of regulation on performance.

Number of Bank Branching (NBB) may have the advantage of increasing the competition in the banking sector. Its significance stems from its effect on the level of concentration in the industry as well as the possibility that it may act as a barrier to entry into the sector by prospective parties. Branching also influences the main performance indicators, namely efficiency and productivity of the banking units (Bamakhramah, 1992). Branching is represented by the total number of bank branches in Nigeria.

4. Findings

Table 1 specifically shows the summary of the calculated independent and dependent variables for the Nigerian Banking Industry from 2001 to 2010. The dependent variable is profitability represented by the ROA while the calculated independent variables are the ratio of demand deposit to total deposit; ratio of foreign asset to total asset; the concentration ratio; Log of total deposit; the number of banks and the number of bank branches. The number of banks in Nigeria and the number bank branches are as reported by (Daily Trust, 2010).

The ratio of DD/TD in 2001 is 47.30% and the highest when compared with other years under the review period. This could be as a result of the adoption of the universal banking model. Afterwards, the ratio was on the average of 43% until 2005 when it rose again to 46.49%. This increase could also be as an after effect of the consolidation exercise concluded in 2005. The ratio maintained an average of 45% in 2006 and 2007 while declining to 45.86%, 37.01% and 39.14% in 2008, 2009 and 2010 respectively.

The FA/TA ratio recorded a varying growth and decline during the period under review. The highest FA/TA ratio of 18.94% was one year after the conclusion of the consolidation exercise in 2006. The FA/TA ratio then fell below 10% afterwards unlike when it was above 10% in the years before 2006. This ratio declined steadily to 8.48%, 9.47%, 7.22% and 7.48% in 2007, 2008, 2009 and 2010 respectively with worst decline to 7.22% in 2009 possibly because of the world economic meltdown.

A cursory look at table 2 shows that throughout the period under review, the concentration ratio which captures the market share of the ten largest banks in the Nigerian banking industry in terms of total deposit has been above 50%. The concentration ratio is at its highest index of 71.8% in 2008 while recording the least index of 53.67% in 2004. Given that low concentration of 0% to 50% ranges from perfect competition to oligopoly; medium concentration of 50% to 80% is likely an oligopoly; and high concentration of 80% to 100% ranges from oligopoly to monopoly, the Nigerian banking structure suggests an oligopoly. This is because, ten banks out of the 89 and 22 banks in Nigeria before and after the consolidation exercise respectively have been accounting for and controlling averagely 60% of the total deposit liability of the Nigerian banking industry during the period under review.

The profitability of the Nigerian banking sector as measured by return on asset has been erratic during the period under review. The Nigerian banking industry has performed better in the pre-consolidation (2001 – 2004) period than in the post-consolidation (2005 – 2010) period. The highest return on asset of 4.73% was recorded in 2001

in the pre-consolidation period while the worst return on asset of 1.61% was recorded in 2006 just a year after the consolidation exercise. Thereafter, increased to 3.89 and 3.95 in 2007 and 2008 respectively but declined to 1.85 in 2009 and to 2.08 by the end of the review period in 2010.

4.1. Regression Results.

Table 3, the regression model summary table shows $R = 0.990$. The result suggests a very high correlation. Likewise with $R^2 = 0.981$, the result indicates how much of the dependent variable profitability (ROA), can be explained by the independent variables DD/TD = Ratio of Demand Deposit to Total Deposit; FA/TA = Ratio of Foreign Asset to Total Asset; CR = Concentration Ratio; $TD \text{ Log}_{10}$ = $\log_{10}$ of Total Bank Deposit; NB = Number of Banks; NBB = Number of Bank Branches. In this case, a 98.1% change in the dependent variable can be explained by the independent variables. This also suggests that an increase in the predictor variables will influence profitability by 98.1%. The Adjusted coefficient of determination is quite high at 94.3%.

The ANOVA table, table 4 indicates that the regression model predicts the outcome significantly as indicated by a high F-Value of 25.898 at 0.011 level of significance. Thus the model is significant at 5% significance level since $0.011 < 0.05$.

The Coefficients in table 5 provides us with information on each predictor variable. This provides us with the information necessary to predict profit from independent variables. The regression relationship is thus stated as follows: $ROA = -10.772 + .164_{DD/TD} - .191_{FA/TA} - .002_{NB} - .001_{NBB} + 1.597_{\text{Log}_{10}TD} + .081_{CR}$.

Table 5 also shows that the ratio of foreign asset to total asset, number of banks, and the number of bank branches has an inverse relationship with profitability, while the ratio of demand deposit to total deposit, total market deposit, and concentration ratio contributes positively to bank profitability. The demand deposits represented by the ratio of demand deposit to total deposit (DD/TD) is positively related with bank ROA though is statistically non-significant. As expected, the ratio of demand deposits to total deposits affected changes in the profitability rates of the Nigerian banks. It had been stated that the ratio of demand deposits to total deposits is expected to exert a noticeable influence on the profitability of Nigerian banks. Since they also constitute large portions of total deposits, they provide banks with almost free loanable funds, thus contributing significantly to the reduction of banking costs. Foreign asset to total asset ratio which measures the degree of foreign exposition of Nigerian banks and their participation in foreign operations is significant but has a negative relationship with performance. The number of banks in a banking sector which stems from bank capital regulation as is the case in Nigeria is statistically non-significant and is negatively correlated with bank profitability. Therefore, the number of banks in Nigeria does not impact on bank profitability. The number of bank branches which may have the advantage of increasing the competition in the banking sector and may result in the development and improvement of services rendered to customers who were previously denied of such services though is statistically significant but negatively impacts on profitability. Through their enlargement of the size of the market and the scope of banking operations, new branches for the banking units can increase the income of these units. On the other hand, new branches inflict extra costs on the banking units, particularly establishment costs (Bamakhramah, 1992). Total bank deposits ($\text{Log}_{10}TD$) is positively correlated with performance but is statistically non-significant. This implies that total banking deposits impacts on performance. This means that the total demand for the services of the banking system vitally and positively influenced the changes in the profitability rates of the Nigerian banking system. The concentration ratio exerted a relatively high effect on the profitability of the Nigerian banking system during the period 2001-2010 as the relationship between concentration indices is positive and statistically significant. Such a result is in consonance with most research conclusions such as (Bhatti and Hussain, 2010; Chirwa, 2003; Molyneux and Forbes, 1995; Lloyd-Williams et al., 1994; Molyneux and Thornton, 1992; Evanoff and Fortier 1988).

5. Conclusion

This paper measured the structure of the Nigerian banking sector and its impact on bank performance. So far, there is no econometric study to our knowledge that has examined this all important issue for the Nigerian banking sector in recent times. A balanced pooled industry dataset of commercial banks in Nigeria during the period of 2001 to 2010 provided the basis for the econometric analysis.

Findings from this study suggest that the Nigerian banking structure is that of an oligopoly and that market concentration is a major determinant of profitability in the Nigerian banking industry. The result also suggests that concentration in the Nigerian Banking market lowers the cost of collusion between firms. Our findings are consistent with most studies that have tested the market structure in their evaluation of bank performance such as

(Bhatti and Hussain, 2010; Chirwa, 2003; Molyneux and Forbes, 1995; Lloyd-Williams et al., 1994; Molyneux and Thornton, 1992; Evanoff and Fortier 1988).

The Nigerian policy makers who are responsible for monetary and financial stability should endeavor to create competitive conditions in the banking industry because competition can lower the financial costs and contribute to improving economic efficiency. The structure of the Nigerian banking sector and thus the profitability level of the banking units in the sector may be improved if the financial sector is allowed to exploit the synergistic effect of market-induced consolidation which we think is ongoing currently. The establishment of investment banks should be encouraged and facilitated in order to skim the still not fully exploited outlets of investment industry e.g. agriculture, manufacturing, small business etc. Financing of such outlets is much needed by the Nigerian economy to enhance growth and development. This will also favorably influence the structure and performance of the Nigerian banking sector.

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Table 1.Data Presentation.

Yr	TDD	TSD	TFCD	TBD	FA	T A
10	3,830,282.0	1,589,175.4	1,506,291.5	9,784,542.5	1,296,356.9	17,331,559.0
09	3,386,526.5	1,171,917.8	1,444,327.1	9,150,037.7	1,265,643.4	17,522,858.2
08	3,650,643.9	1,091,812.2	924,105.0	7,960,166.9	1,506,845.9	15,919,559.8
07	2,307,916.2	753,868.8	474,404.1	5,001,470.5	930,748.0	10,981,693.6
06	1,497,903.7	592,514.8	302,380.0	3,245,156.5	1,358,276.1	7,172,932.1
05	946,639.6	401,986.8	188,511.1	2,036,089.8	463,238.7	4,515,117.6
04	728,552.0	359,311.2	172,538.3	1,661,482.1	481,295.5	3,753,277.8
03	577,663.7	312,368.9	122,587.2	1,337,296.2	437,658.6	3,047,856.3
02	503,870.4	244,064.1	109,037.0	1,157,111.6	398,210.0	2,766,880.3
01	448,021.4	216,509.4	47,198.4	947,182.9	305,028.5	2,247,039.9

Source: CBN Statistical Bulletin.

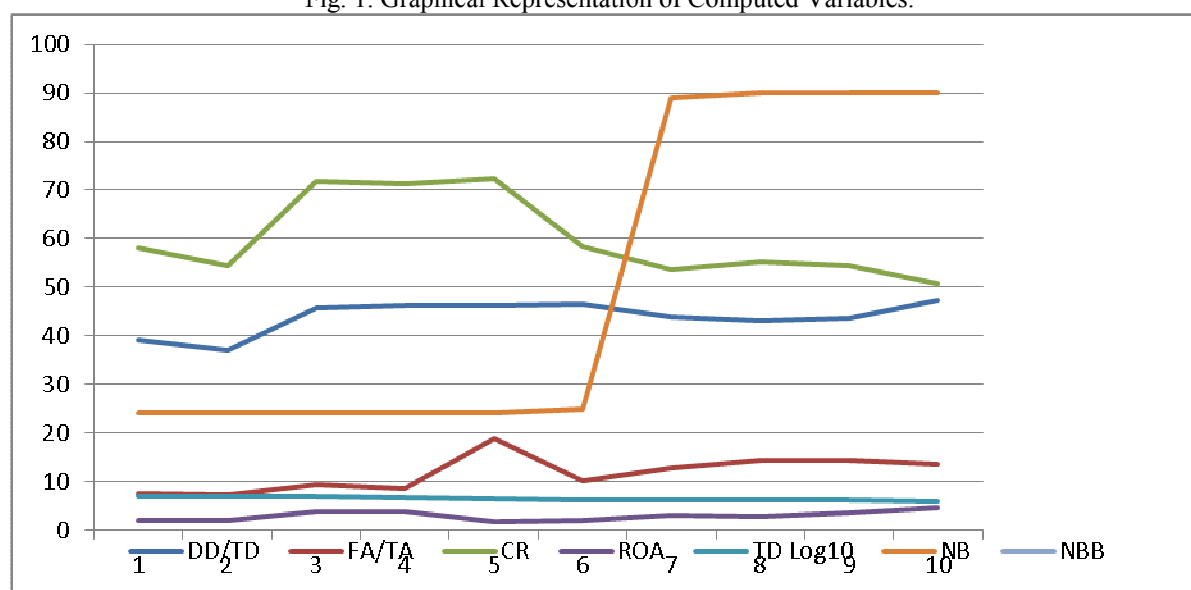
NB: DD = Total Demand Deposit; SD = Total Savings Deposit; FCD = Total Foreign Currency Deposit; TBD = Total Bank Deposit; TBA = Total Bank Asset. Table 1.Presents the data as handpicked from the Central Bank of Nigeria Statistical bulletin for a ten year period. This table enhanced the calculation of the operational variables presented in table 2.

Table 2 Summary of Operational Variables.

Year	DD/TD	FA/TA	CR	ROA	Log ₁₀ TD	NB	NBB
2010	39.14626	7.48	58.12	2.08	7.0	24	5407
2009	37.01107	7.22	54.43	1.85	7.0	24	5407
2008	45.8614	9.47	71.8	3.95	6.9	24	5407
2007	46.14475	8.48	71.4	3.89	6.7	24	5407
2006	46.15814	18.94	72.3	1.61	6.5	24	5407
2005	46.49302	10.26	58.42	1.85	6.3	25	5407
2004	43.84952	12.82	53.67	3.12	6.2	89	3492
2003	43.19639	14.36	55.3	2.67	6.1	90	3247
2002	43.54553	14.39	54.5	3.47	6.1	90	3010
2001	47.30041	13.57	50.8	4.73	6.0	90	2193

Source: CBN Annual Reports of various years; CBN Statistical Bulletin; and Authors computation. Note: DD/TD = Ratio of Demand Deposit to Total Deposit; FA/TA = Ratio of Foreign Asset to Total Asset; CR = Concentration Ratio measured in relation to Total Deposit; ROA = Return on Asset; TD Log₁₀ = log₁₀ of Total Bank Deposit; NB = Number of Banks; NBB = Number of Bank Branches.

Fig. 1. Graphical Representation of Computed Variables.



SOURCE: Authors' graphical presentation.

Note: DD/TD = Ratio of Demand Deposit to Total Deposit; FA/TA = Ratio of Foreign Asset to Total Asset; CR = Concentration Ratio measured in relation to Total Deposit; ROA = Return on Asset; TD Log₁₀ = log₁₀ of Total Bank Deposit; NB = Number of Banks; NBB = Number of Bank Branches.

Table 3. Regression Model Summary.

Model	R	R ²	Adj. R ²	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.990 ^a	.981	.943	.25618	.981	25.898	6	3	.011	3.019

a. Predictors: (Constant), CR, FATA, DDTD, NB, LOGtd, NBB

b. Dependent Variable: ROA

Source: Authors' SPSS output result.

NOTE:

R = Correlation Coefficient or Beta

R² = Coefficient of Determination

Adj. R² = Adjusted Coefficient of Determination

Table 4. ANOVA of the SPSS Regression result.

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	10.197	6	1.700	25.898	.011 ^a
Residual	.197	3	.066		
Total	10.394	9			

a. Predictors: (Constant), CR, FATA, DDTD, NB, LOGtd, NBB

b. Dependent Variable: ROA.

Source: SPSS output result.

Table 4.5. Coefficients of the SPSS Regression Result.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-10.772	11.671		-.923	.424
DDTD	.164	.094	.516	1.742	.180
FATA	-.191	.050	-.667	-3.800	.032
NB	-.002	.015	-.063	-.132	.903
NBB	-.001	.000	-1.726	-3.803	.032
LOGtd	1.597	1.195	.585	1.337	.274
CR	.081	.040	.632	2.023	.136

a. Dependent Variable: ROA

Source: Authors' SPSS output result.

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