ON SOME PERFORMANCE INDICATORS FOR ESTIMATING AND BOOSTING THE TOTAL ASSETS OF A BANK: THE NIGERIAN EXPERIENCE

ISSN: 2141 – 3290
www.wojast.com

[1]UTO, N. P. AND [2]UDOIDEM, J. O.
[1]Department of Mathematics and Statistics,
[2]Department of Banking and Finance
University of Uyo, Uyo, Akwa Ibom State, Nigeria
[1]e-mail: censero2002@yahoo.com
[2]e-mail: judoidem@yahoo.com

ABSTRACT

This paper presents some performance indicators; Fixed Assets, Bills discounted and Balances with other banks capable of impacting (boosting) the Total Assets of a bank, with a view to examining the functional relationship existing between them and subsequently determining which of the indicators contributes most significantly to boosting the Total Assets, using linear regression analysis. Data was obtained from the Annual Reports Bulletin of Union Bank of Nigeria plc. A multiple linear regression model was fit to the data. Standardized residuals computed for the model with the aid of SPSS software were found to be normally distributed under the Shapiro-Wilk Normality test. Results further show a significant linear relationship existing between these indicators and the Total Assets; with the indicators together explaining 96.3% of the total variation in the Total Assets. The partial F-test revealed that Fixed Assets contributes most significantly to boosting the Total Assets in the model.

INTRODUCTION

Nigeria is striving to develop a vibrant and sophisticated financial services industry capable of meeting the challenges of the twenty first century. After South Africa, Nigeria hosts the largest foreign banking community in Sub-Saharan Africa (Siddiqi, 2004).

Banks, as financial intermediaries, play a crucial role in the operations of most economies (Ekezie, 1997). They are indeed the prime movers of economic life; they occupy a significant place in the economy of every nation. Their operations are perhaps the most heavily regulated and supervised of all businesses, Udoidem (1995), Soyibo and Adekanye (1991) and Ebhodaghe (1997). The importance of Nigerian banks is exemplified by their prominence in the Structural Adjustment Programme (SAP) embarked upon by the nation in July 1986. Nigeria undertook a broad programme of financial liberalization. Interest rates and entry into the banking system were liberalized, and credit allocation quota loosened. This led to the influx of many new bank operators that specialized in foreign exchange operations which subsequently paved way for returns on equity of 300% or more, Sobodu and Akiode (1998), Beck *et al* (2005) and Lewis and Stein (2002).

As part of a country's planned development effort, its financial sector could provide funds to finance developmental projects. The flow of funds from financial intermediaries may lead to a significant increase in the growth rate of output if the funds are allocated to uses which are strategic in the process of resource creation. Financial sector development helps economic growth through more efficient resource allocation and productivity growth rather than through the scale of investment or savings mobilization (Beck *et al*, 2000). Thus, there is a convergence of views that the financial sector of an economy, the bank, contributes significantly to the economic development of a nation.

The Total Assets of a bank depends on a number of factors, but some of these factors play a major role than others in boosting its Total Assets; that is, they are to a large extent responsible for a higher Total Assets of a bank. Deposit accounts in banks or similar institutions are the primary mechanism for transferring payments from one person to another, an important means of storing wealth, and through lender's credit decisions, reinvesting that wealth to promote social needs (Ebhodaghe, 1997). The efficacy of financial intermediation could have an effect on economic growth. Intermediation affects the net returns on savings and the gross returns on investments. However, the spread between these two returns mirrors the banks' interest margin, which suggests that banks' interests could be used as indicators of the efficacy of the banking system (Nwankwo, 1980).

In order to maximize profit in a corporate organization such as the bank, there is need to ensure effective utilization of resources by management. Since Fixed Assets, Bills discounted and Balances with other banks constitute some of the major determining factors of the Total Assets of a bank which is usually low in the Nigerian setting, there is great need to maximize them with greater attention to the one that contributes most significantly to boosting its Total Assets, which this paper seeks to ascertain.

Financial sector development fosters economic growth and reduces poverty by widening and broadening access to finance and allocating society's savings more efficiently. Countries with better developed financial systems, that is, financial markets and institutions that more effectively channel society's savings to its most productive use, experience faster economic growth (Beck, 2006).

The monetary policy and hence the economy of a nation would tend to improve with an increasing number of operating banks that are resistant to adverse financial conditions. Policy makers, economists and monetary authorities recognize that the ability of banks to achieve the desired results and to continue to play the role earmarked for them depends not only on the existence of an enabling environment and the number of operating banks (and perhaps the spread of bank branches) but more importantly on their performance from one financial year to the other (Sobodu and Akiode, 1998). Market structure, variation in banking power, bank concentration and existence of explicit deposit, insurance as well as investment affect banking profitability (Barth *et al*, 1997).

The banking sector is faced with myriad problems. These problems include: margin lending, low capital and Asset base, as well as the inability of some banks to pay full salary to workers. The recent economic meltdown which has led to a crash in stock exchange equally has a serious negative effect on banks as their investments on stocks are no longer yielding optimum profit. These problems has led to liquidation of some banks; as those having a low Asset base could not survive, which in turn induce merger with other banks.

Assets are known to be things of value that can be readily converted into cash. According to Adesola *et al* (2005), assets are probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events. Total assets is the sum of current and long term assets owned by a person, company or some other entity (Downes, 2003). As noted by Siegel (2005), Total assets involve all the property owned by a corporation which includes current assets, fixed assets such as buildings and equipment, and other assets such as licences and goodwill.

Current assets are reasonably expected to be sold, collected or consumed within one year or within the normal cycle of a business (Larson, 1997). As reported by Tracy (1974), current assets are short term assets that are usually converted into cash within one year. Fixed or capital assets such as land, buildings, machinery, furniture and motor vehicle are acquired to carry on the business of a company with a life exceeding one year. Fixed assets are long-term in nature and held for periods longer than the accounting period (Pandey, 2007). According to Cashin

and Lerner (1987), tangible assets that are relatively permanent and needed for the production or sale of goods or services are termed property, plant and equipment, or Fixed assets. They noted that the negotiability of a note receivable enables the holder to receive cash from the bank prior to the maturity date, though at a discount from its maturity value, known as discounting.

Afonso and Claeys (2007) obtained a model-based indicator of structural balance to examine the relation between the cyclical components of Total revenues and expenditures and the budget balance in France, Germany, Portugal and Spain, and observed that the fiscal slippages are mainly due to reversals in tax policies, which are unmatched by expenditure adjustments. Bai (1997) examined the least squares estimation of a change point in multiple regressions under consistency, rate of convergence, and asymptotic distributions, and showed that for non stationary regressors or disturbances, the asymptotic distribution is skewed.

In recent times, disparities in performances among banks in Nigeria have attracted considerable attention from bank regulators and monetary authorities. Among the major factors believed to account for this diversity is financial functioning. The Central Bank of Nigeria (CBN) recently came up with some modalities that will help forestall the incidence of bank failures. With the upcoming reform in the banking sector, under the modified universal banking license regime, which came into effect in the last quarter of 2010, Commercial banks operating in the country will no longer be allowed to undertake businesses such as provision of financial advisory for a fee, Asset management services, owning subsidiaries, and others, outside their core function of financial intermediation. Again, each of these banks will be expected to operate on a regional, national or international basis with the attendant restrictions on the minimum capital base as well as their coverage area (Omoh, 2010). Hence, to further facilitate the survival and proper functioning of these banks, and also forestall any negative consequences of the reform on them, they need to build up a sound financial base via boosting their Assets to enhance their performance.

METHODOLOGY

In this study, we adopt linear regression analysis, which measures the linear functional relationship existing between the regressors, X's and a response, Y, Altman (1991) and Campbell and Machin (1993).

Model Specification

Suppose Y denote the response Variable-Total Assets of a Bank (in ₦'m), and X_1, X_2, X_3 the regressors, representing Fixed Assets, Bills discounted and balances with other banks, respectively (also in ₦'m). Let *i* index the observations on the data pair (x_1, x_2, x_3; y), then the multiple linear regression model for this work becomes:

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + \varepsilon_i \quad ,i = 1,2,...,n \tag{1}$$

where $\beta_0, \beta_1, \beta_2$ and β_3 are the regression coefficients, and ε_i the *ith* residual.

Assumptions of the Model

(1) $\mathrm{E}(\varepsilon_i) = 0$

(2) $\mathrm{E}(\varepsilon_i^2) = \sigma^2 \quad \forall i$

(3) $\mathrm{E}(\varepsilon_i \varepsilon_j) = 0 \quad \forall i \neq j$

For estimation purposes, we fit the corresponding model:

$$\hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2 + \hat{\beta}_3 X_3 \tag{2}$$

with the aid of MINITAB software; where $\hat{\beta}_0$, $\hat{\beta}_1$, $\hat{\beta}_2$ *and* $\hat{\beta}_3$ denote the least squares estimates of $\beta_0, \beta_1, \beta_2$ and β_3, respectively.

Standardized residuals were computed for the model using SPSS software, and Shapiro-Wilk Normality test was adopted and performed on the standardized residuals via STATISTIX software for a check of conformity to Normal distribution, which is an assumption of linear regression. Analysis of variance (F-test) was employed to ascertain the relevance of the linear relationship between the regressors and response as described by equation (3), and the coefficient of multiple determinations (R^2) computed for the model to determine its goodness of fit. These were achieved with the aid of MINITAB. Partial F-test was also employed to examine the relative contributions of the regressors in explaining the variation in the response when each regressor is already in the model; with a view to determining which one of them contributes most significantly to boosting the response variable.

RESULTS AND DISCUSSION

The least squares estimates $\hat{\beta}_0,\ \hat{\beta}_1,\ \hat{\beta}_2\ and\ \hat{\beta}_3$ of the respective model parameters $\beta_0, \beta_1, \beta_2\ and \beta_3$ obtained using MINITAB are: -54,156; 19.002; 0.15 and 1.1097, respectively: see Table 1

Table 1: Coefficients for Regression of Y on X_1, X_2, and X_3

	Constant	**X_1**	**X_2**	**X_3**
Coefficient	-54,156	19.002	0.15	1.1097

Thus, the estimated regression model becomes:

$$\hat{Y} = -54156 + 19.002X_1 + 0.15X_2 + 1.1097X_3 \qquad (3)$$

The *p*-value of 0.3922 ($p>0.05$) and W-Statistic of 0.9434 ($W \rightarrow 1$) for the Shapiro-Wilk Normality test are evidences that the standardized residuals are normally distributed with zero mean and unit variance (Table 2).

Table 2: Shapiro-Wilk Normality Test

Variable	**W**	**P**
Standardized Residual	0.9434	0.3922

From the analysis of variance (ANOVA) Table for testing the significance of the regression of Y on X_1, X_2 and X_3 presented in Table 3.

Table 3: ANOVA Table for Testing the Significance of the Regression of Y on X_1, X_2, and X_3.

Source of Variation	**DF**	**SS**	**MS**	**F**	**P**
Regression	3	8.59282×10^{11}	2.86427×10^{11}	103.74	0.000
Residual	12	33,131,825,761	2,760,985,480		
Total (corrected)	15	8.92414×10^{11}			

the *p*-value of 0.000 ($p<0.05$) shows that the linear relationship between X_1, X_2, X_3 and Y as given by equation (3) is worthwhile. Also the coefficient of multiple determination (R^2 = 96.3%: see Table 4)

Table 4: Coefficient of Determination for various regression models.

Coefficient of Determination	**Regression Model**			
	Y on X_1, X_2 & X_3	**Y on X_1 alone**	**Y on X_2 alone**	**Y on X_3 alone**
	96.3%	93.7%	85.2%	90.3%

Table 4 indicates that 96.3% of the total variation in Y is explained by the linear relationship with X_1, X_2 and X_3, thus the fitted model given in equation (3) provides a good fit to the data.
Again, equation (3) reveals that if each $X_i (i = 1,2,3)$ attains a zero value (₦0.00m), that is, suppose a bank looses all its Fixed Assets, Bills discounted and balances with other banks, its Total Assets (Y) is estimated at a deficit of ₦54.156bn. Also, for each unit increase in X_1 while

holding X_2 and X_3 fixed in the model, Y is expected to increase by 19.002 units; again, Y is expected to increase by 0.15 units (15%) for each unit increase in X_2 while holding X_1 and X_3 fixed; and Y is also expected to increase by 1.1097 units for every unit increase in X_3 when X_1, and X_2 are held fixed in the model. Again, with each $\hat{\beta}_i (i = 1,2,3) > 0$, it is obvious that higher values of X_1, X_2 and X_3 would induce a corresponding higher value of Y, and vice versa. Suppose ₦p, ₦q and ₦r (q<r<p) denote the respective values of X_1, X_2 and X_3 for a bank; with $\hat{\beta}_2 < \hat{\beta}_3 < \hat{\beta}_1$, the bank is expected to have a higher value of Y than when another inequality combination of p, q and r holds. The results of the Analysis of variance (ANOVA) for testing the significance of the regression of Y on each $X_i (i = 1,2,3)$ presented in Tables 5a, 5b and 5c, respectively:

Table 5a: ANOVA Table for Testing the Significance of the Regression of Y on X_1 alone.

Source of Variation	DF	SS	MS	F	P
Regression	1	8.36489×10^{11}	8.36489×10^{11}	209.40	0.000
Residual	14	55,925.494070	3,994,678,148		
Total (corrected)	15	8.92414×10^{11}			

Table 5b: ANOVA Table for Testing the Significance of the Regression of Y on X_2 alone.

Source of Variation	DF	SS	MS	F	P
Regression	1	7.60738×10^{11}	7.60738×10^{11}	80.88	0.000
Residual	14	1.31677×10^{11}	9,405,478,342		
Total (corrected)	15	8.92414×10^{11}			

Table 5c: ANOVA Table for Testing the Significance of the Regression of Y on X_3 alone.

Source of Variation	DF	SS	MS	F	P
Regression	1	8.05891×10^{11}	8.05891×10^{11}	130.40	0.000
Residual	14	86,522,851,881	6,180,203,706		
Total (corrected)	15	8.92414×10^{11}			

Table 5c show that each regressor, $X_i (i = 1,2,3)$ contributes significantly to the prediction of the response variable, Y ($p = 0.000 < 0.05$, in each case). The partial F-test reveals that when each regressor $X_i (i = 1,2,3)$ enters the model first, the inclusion of $X_{i'}$ *and* $X_{i''} (i' \neq i'' \neq i)$ is worthwhile ($F_{computed}$ = 4.13, 17.85, and 9.67, respectively > $F_{critical}$ = 3.89, in each case): see Tables 6a, 6b and 6c.

Table 6a: ANOVA Table for Testing the contribution of X_2 and X_3 when X_1 is already in the model.

Source of Variation	DF	SS	MS	F	Partial Coefficient of Determination (%)
$\beta_1, \beta_2, \beta_3, \mid \beta_0$	3	8.59282×10^{11}	2.86427×10^{11}	103.74	
$\beta_1 \mid \beta_0$	1	8.36489×10^{11}	8.36489×10^{11}	302.97	93.7
$\beta_2, \beta_3 \mid \beta_0, \beta_1$	2	2.2793×10^{10}	1.13965×10^{10}	4.13	2.6
Residual	12	33,131,825,761	2,760,985,480		
Total (corrected)	15	8.92414×10^{10}			

Table 6b: ANOVA Table for Testing the contribution of X_1 and X_3 when X_2 is already in the model.

Source of Variation	DF	SS	MS	F	Partial Coefficient of Determination (%)
$\beta_1, \beta_2, \beta_3, \mid \beta_0$	3	8.59282×10^{11}	2.86427×10^{11}	103.74	
$\beta_2 \mid \beta_0$	1	7.60738×10^{11}	7.60738×10^{11}	275.53	85.2
$\beta_2, \beta_3 \mid \beta_0, \beta_2$	2	9.8544×10^{10}	4.9272×10^{10}	17.85	11.1
Residual	12	33,131,825,761	2,760,985,480		
Total (corrected)	15	8.92414×10^{11}			

Table 6c: ANOVA Table for testing the contribution of X_1 and X_2 when X_3 is already in the model.

Source of Variation	DF	SS	MS	F	Partial Coefficient of Determination (%)
$\beta_1, \beta_2, \beta_3, \mid \beta_0$	3	8.59282×10^{11}	2.86427×10^{11}	103.74	
$\beta_3 \mid \beta_0$	1	8.05891×10^{11}	8.05891×10^{11}	291.89	90.3
$\beta_2, \beta_3 \mid \beta_0, \beta_3$	2	5.3391×10^{10}	2.66955×10^{10}	9.67	6
Residual	12	33,131,825,761	2,760,985,480		
Total (corrected)	15	8.92414×10^{11}			

Again the coefficient of determination (r^2) with respect to each $X_i (i = 1,2,3)$ are 93.7%, 85.2% and 90.3%; which shows that $X_i (i = 1,2,3)$ individually explain 93.7%, 85.2% and 90.3%, respectively of the total variation in Y, while the inclusion of $X_{i'}$ *and* $X_{i''}$ $(i' \neq i'' \neq i)$ in the model account for the remaining 2.6%, 11.1% and 6%: (Table 4, 6a, 6b and 6c).

Hence, since Fixed Assets (X_1) alone explains 93.7% of the total variation in the Total Assets (Y) which is the highest explained by any regressor, and with the inclusion of X_2 and X_3 an increase of only 2.6% (the least offered by inclusion of adjacent variables), it follows that Fixed Assets (X_1) contributes most significantly to boosting the Total Assets (Y) in the linear model

CONCLUSION

The Total Assets of a bank is affected positively and significantly in a linear form by its Fixed Assets, Bills discounted and balances with other banks as given by the fit linear model in equation (3). These indicators together explain 96.3% of the total variation in the Total Assets which makes the model in equation (3) adequate for estimating the Total Assets of a bank given the values of its Fixed Assets, Bills discounted and Balances with other banks. An increase in the values of these indicators would increase the Total Assets. In particular, if a bank's Fixed Assets, Bills discounted and Balances with other Banks are rated as ₦p, ₦q and ₦r (q<r<p), respectively, such bank's Total Asset is expected to be higher than when there is another inequality combination of the values of p, q and r. Again, suppose each of these indicators attain (assume) a zero value (₦0.00m), the bank stands the risk of having a deficit to the tune of N54.156bn in its Total Assets, which is disastrous. Amongst these indicators, Fixed Assets (X_1) contributes most significantly to boosting the Total Assets (Y) in the linear model. Hence banks should aim at increasing their Fixed Assets, Bills discounted and Balances with other banks, but with greatest focus on Fixed Assets in view of boosting its Total Assets.

REFERENCES

Adesola, S. M., Aderibigbe, P. and Akinola, O. O. (2005). An Introduction to Financial Accounting for Managers. Obafemi Awolowo University Press Ltd., Ile-Ife, Nigeria.

Afonso, A. and Claeys, P. (2007). The dynamic behaviour of budget components and output. Working Paper Series, European Central Bank.

Altman, D. G. (1991). Practical Statistics for Medical Research. Chapman & Hall, London.

Bai, J. (1997). Estimation of a Change Point in Multiple Regression Models. Review of Economics and Statistics, **79**(4), 551-563.

Barth, M. M., Kerbel, E. L., Broussard, S. and Schmidst, S. J. (1997). Commercial Banking Structure, Regulations and Performance, an International Comparism. Controller of the Currency Economics Working Paper.

Beck, T. (2006). Creating an Efficient Financial System: Challenges in a Global Economy (http://siteresources.worldbank.org/DEC/Resources/creating_An_EfficientFinancial_System.pdf).

Beck, T., Cull, R. and Afeikhena, J. (2005). Bank privatization and performance – Empirical evidence from Nigeria. Journal of Banking and Finance, **29**(8-9), 2355-2379.

Beck, T., Levine, R. and Loayza, N. (2000). Finance and the sources of Growth. Journal of Financial Economics, **58**, 261-300.

Campbell, M. J. and Machin, D. (1993). Medical Statistics a Commonsense Approach (Second Edition). John Wiley & Sons, London.

Cashin, J. A. and Lerner, J. J. (1987). Theory and Problems of Accounting 1 (Third Edition). McGraw-Hill, New York, USA.

Dowes, J. (2003). Dictionary of Finance and Investment Terms. Baron's Financial Guides, USA.

Ebhodaghe, J. U. (1997). Safe and Sound Banking Practices in Nigeria: Selected Essays, Page Publishers Services Ltd, Yaba, Lagos, Nigeria.

Ekezie, E. S. (1997). Elements of Banking (Money, Financial Institutions and Markets). African-Fep Publishers, Onitsha, Nigeria.

Larson, K. D. (1997). Essentials of Financial Accounting for Business Decision (Seventh Edition), Irwin/McGraw-Hill, New York, USA.

Lewis, P. and Stein, H. (2002). The political economy of financial liberalization in Nigeria, in: Stein, H., Ajakaiya, O. and Lewis, P. (Eds.), Deregulation and Banking Crisis in Nigeria, Palgrave, New York, USA.

Nwankwo, G. O. (1980). Nigerian Financial System. Macmillan Publishing Ltd. Lagos, Nigeria.

Omoh, G. (2010). CBN restrains banks from fee, insurance, asset management, issuing house and capital market activities. (http://www.vanguardngr.com/2010/08/16/cbn-restrains-banks-from-fee-insurance-asset-management).

Pandey, I. M. (2007). Financial Management (Ninth Edition), Vikas Publishing House, PVT Ltd., India.

Ok Siddiqi, M. A. (2004). Nigeria Banks on Growth. In: African Review of Business and Technology. (http://unpan1.un.org/intradoc/groups/public/documents/ IDEP/ UNPAN016363.pdf).

Siegel, J. G. (2005). The Vest Pocket CPA. Wiley Publisher, New Jersey.

Sobodu, O. O. and Akiode, P. O. (1998). Bank Performance and Supervision in Nigeria: Analysing the transition to a deregulated economy, AERC Research Paper 71.

Soyibo, A. and Adekanye, F. (1991). Financial System Regulation, Deregulation and Savings Mobilisation in Nigeria, A Final Report, AERC Research Paper.

Tracy, J. A. (1974). Fundamentals of Financial Accounting. John Wiley & Sons Inc., Canada.

Udoidem, J. O. (1995). The Role of Banks in Economic Growth and Development: A case study of Nigeria. M.Sc. Thesis, University of Benin, Nigeria.