Effects of Accounting Information Management on Profitability of Nigerian Banking Industry

Agbaje, Wale Henry[1], Busari, Ganiyu Adeniran[2], Adeboye, Nureni Olawale[3]

[1]Department of Accountancy, Ebonyi State University, Nigeria
[2]Department of Accountancy, Ebonyi State University, Nigeria
[3]Department of Mathematics&Statistics, Federal Polytechnic Ilaro, Nigeria
[1]*henryagbaje1@yahoo.com*
[2]*yeminiran2002@yahoo.com*
[3]*adeboye_olawale@yahoo.com*

Abstract: *This study examined the extent to which accounting information management has enhanced the profitability of Nigerian banks. In the model specified, accounting information on Liquidity, credit quality, cash flow, wage rate, exchange rate and Inflation rate are the Jointly Pre-determined variables while, Profitability the Determined variable. The work involves the use of Ordinary Least Square (OLS) Regression technique to fit a realistic model into the collected time data, and several model's validity techniques such as Coefficient of determination (R^2), Multiple Correlation coefficient(r), Durbin-Watson, Akaike info Criterion (AIC), Schwarz Criterion (SWC) and F-statistic were employed to validate this model. The model was also tested for Stationary using Unit Root test and Augmented Dickey Fuller (ADF) while Hypothesis tested to validate our theoretical background on banking Profitability as it is affected by accounting information management. The result revealed that accounting information had impacted significantly on the growth of Profitability in Nigerian banking industry has observed in the R^2 of 80.24%, Correlation coefficient of 0.90, Durbin-Watson of 1.76, AIC of 7.48, SWC of 7.87 and F-result of 43.13 with significance value of 0.000034. Also, the Stationary test carried out for the model shows that there is a short run relationship at First Difference between Profitability and all the explanatory variables considered in this research.*

Keywords: *Accounting Information, Profitability, Ordinary Least Square Regression Technique, Durbin Watson, Augmented Dickey Fuller*

1. INTRODUCTION

Accounting information as a scientific process is about provision of financial information needed to take decision particularly in respect of acquisition and use of scarce corporate resources as well as the elimination of wastes in the wealth creation chain to maximize profit.

Osisioma (1990:), considers information as representing data or knowledge evaluated for specific use. He defined accounting information as "data organized for the special purpose of decision making"

According to Lucey (1991), "information consists of data that have been retrieved, processed or otherwise used for informative or inference purpose, argument or as a basis for forecasting or decision making"

Modum (1995) noted that information is not synonymous with data. She stated that information is to data what a finished product is to the raw materials used in producing it. In other words data is information in its raw unprepared forms. She further added that information has become for management, a very valuable commodity. This is because experts in business management have come to agree that in today's business environment, where competition has become extremely keen, available and effective information can indeed become the critical factor which enables *business* organization to have that vital edge over its competitors.

Anthony and Reece (1975), also defines information as "a fact, datum, observation, perception or any other thing that adds to knowledge. Information requirements tend to differ with the

organizational level. Since the nature of decision making varies as one move up the organizational pyramid, managers rely on detailed information that is contained in reports. These report usually specified in financial terms often originate from the accounting system.

The Accounting Principles Board (APB) of India (1970), defined accounting as a service of activity. Accounting is not an end in itself but an important information device. Its function is to provide quantitative information, primarily financial in nature, about economic entities that are intended to be useful in making economic decisions and also in making seasoned choices among alternative courses of action.

Salmonson, et al (1981), defined accounting as an information system designed to provide, through financial statements a relevant financial information. The optimum objective of accounting is in the use of accounting information, through analysis and interpretation as a basis for business decisions. Information obtained from accounting records are utilized by management in controlling current operations and in planning for ones.

Horngren and Foster (1988) defined accounting systems as, "A set records, procedures, and equipment that routinely deals with the events affecting the financial performance and position of the organization.

Glautier and Underdown (1982) on the other hand considered that there are four elements that make up an accounting system vis-à-vis Function or activities, the people, the machines by which tasks are carried out and the network of reports that transmit information. Osisioma (1999), defined Accounting information System as an entity or a component within an organization that processes financial transactions to provide score-keeping, attention- Directing and decision-making information to users.

It is pertinent to note that we cannot underestimate the importance of Information Communication Technology (ICT) in the execution and management of Accounting Information. Osisioma (1999), Modum (1995) and Boockholdt (1999) emphasized much on this opinion.

The recent Banking reforms in Nigeria arose mainly out of the need to address threats of systemic market failure occasioned by inadequate prudential management, fraud, and other credit related issues. It is generally believed that one of the major causative factors in this regard is the inadequate use of relevant accounting information for planning and decision making in determining the effects of these variables on the going concern status of the banks.

This research seeks to confirm whether the efficient management of accounting information systems could help resolve the issue of potential market failure. In this research, emphasis is on the role played by accounting information during decision making at all levels of management for profitability with special focus on the banking industry in Nigeria.

This research work shall adopt a Classical Linear Regression model where Profitability of a competitive firm is built as a function of the quality of its accounting information management. Hence,

$$P = f\ (AIM) \tag{1}$$

Where P = Profitability

AIM= Accounting information management.

The level of information considered here are based on liquidity (LQ), credit quality (CQ), cash flow of the firm (CF), the wage rate (WR), exchange rate (ER) as well as inflationary levels in the economy (INR). To this end, equation (1) can be modified as:

$$P = f\ (LQ, CQ, CF, WR, ER, INR) + e_i \tag{2}$$

When written in explicit form, equation (2) becomes

$$P_{i =} \beta_0 + \beta_1\ LQ_i + \beta_2\ CQ_i + \beta_3 CF_i + \beta_4\ WR_i + \beta_5\ ER_i + \beta_6\ INR_i + \varepsilon_i \tag{3}$$

This model shall be critically examined for validity and hence establish reasonable inferences on the effects of the regressors on Profitability of Banking industries.

2. MATERIALS AND METHODS

To analyze the data collected, the classical linear regression model shall be fitted, and several model's validity techniques such as Coefficient of determination (R^2), Multiple Correlation coefficient(r), Durbin-Watson, Akaike info Criterion (AIC), Schwarz Criterion (SWC) and F-statistic were employed to validate the model. The model was also tested for Stationary using Augmented Dickey Fuller (ADF) Unit Root test while Hypothesis tested to validate our theoretical background on banking Profitability as it is affected by accounting information management.

The CLRM model can be written in terms of the k-variable population regression function (PRF) model involving the dependent variable Y and k-1 explanatory variables $X_2, X_3, \ldots, X_k$ as:

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \ldots + \beta_k X_{ki} + u_i, \quad i = 1,2,3,\ldots,n \tag{4}$$

Where, β_1 = the intercept

β_2 to β_k = partial slope coefficients

u = stochastic disturbance term

And $i = i^{th}$ observation, n' being the size of the population.

This equation identifies k-1 explanatory variables (regressors) namely $X_1, X_2, \ldots X_k$ and a constant term that assumed to influence the dependent variable (regressand).

The essence of regression in econometrics is to generalized for the population from what we get from the sample. For instance, the linear relationship from Equation (4) holds for the population only if we could obtain considerable values of Xs, Y and u which form the population values of these variables. Since this is impossible in practice, the alternative is to get sample observations for Xs and Y, specify the distribution of the u's and try to get satisfactory estimate of true parameters of the relationship.

This is done by fitting a regression line to the observed sample data as an approximation to the true line. If then the true relationship between Xs and Y is as given in Equation (3), the true regression line is

$$E(Y_i) = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \ldots + \beta_n X_{ki} \tag{5}$$

And the estimated relationship is:

$$Y_i = b_1 + b_2 X_{2i} + b_3 X_{3i} + \ldots + b_n X_{ki} + e_i \tag{6}$$

Equation (3) is a shorthand expression for the following set of n simultaneous equations:

$$Y_1 = \beta_1 + \beta_2 X_{21} + \beta_3 X_{31} + \ldots + \beta_n X_{k1} + u_1$$
$$Y_2 = \beta_1 + \beta_2 X_{22} + \beta_3 X_{32} + \ldots + \beta_n X_{k2} + u_2 \tag{7}$$
$$.\qquad .\qquad\qquad .\qquad .\qquad .$$
$$Y_2 = \beta_1 + \beta_2 X_{2n} + \beta_3 X_{3n} + \ldots + \beta_n X_{kn} + u_n$$

We can write the system of equations (7) in matrix form as shown below:

$$\begin{pmatrix} Y_1 \\ Y_2 \\ \vdots \\ Y_n \end{pmatrix} = \begin{pmatrix} 1 & X_{21} & X_{31} & \ldots & X_{k1} \\ 1 & X_{22} & X_{32} & \ldots & X_{k2} \\ \vdots & & & & \\ 1 & X_{2n} & X_{3n} & \ldots & X_{kn} \end{pmatrix} \begin{pmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_n \end{pmatrix} + \begin{pmatrix} u_1 \\ u_2 \\ \vdots \\ u_n \end{pmatrix} \tag{8}$$

Y	=	X	β	+	u
n x 1		n x k	k x 1		n x 1

where,

Y = n x 1 column vector of observations on the dependent variable Y.

X = n x k matrix giving 'n' observations on k − 1 variables X_2 to X_k, the first column of 1's representing the intercept term.

β = k x 1 column vector of the unknown parameters $\beta_1, \beta_2, \ldots, \beta_k$.

u = n x 1 column vector of n disturbances u_i.

Equation (8) can be written more compactly as:

Y = Xβ + u   (9)

To obtain the consistent estimators of β, we minimise the residual sum of square (SSE) which is normally given as ESS = u'u   (10)

But u = Y − Xβ   (11)

Hence,   u'u = (Y − Xβ)'(Y − Xβ)

                      = Y'Y − β'X'Y − Y'Xβ + β'X'Xβ

                      = Y'Y − 2β'X'Y + β'X'Xβ

Since the transpose of a scalar is a scalar, thus;

Y'Xβ = (Y'Xβ)' = β'X'Y

Thus, $\frac{\partial u'u}{\partial B / \hat{B}}$ = - 2 X'Y − 2X'X$\hat{\beta}$ = 0

                      2X'X$\hat{\beta}$ = 2 X'Y

                      $\hat{\beta}$ = (X'X)$^{-1}$ X'Y   (12)

Where equation (12) is the least square estimates for the parameters of a classical linear regression model.

3. RESULTS AND DISCUSSION

Fitting of Classical Linear Regression model

The required OLS model fitted into the collected data is given as

$P_i = 23.04034 + 1.252080\, LQ_i + 0.271085 CQ_i + 1.424288 CF_i + 2.559871 WR_i$

$\quad\quad + 2.404285 ER_i + 0.056765 INR_6$ (13)

Table 1. *Results of OLS Statistic*

Statistic	Values
R^2	0.802425
Adjusted R^2	0.868283
AIC	7.476768
SWC	7.8735
F	43.12852
DW	1.755924

Table 2. *Test for Unit Root*

Variable	ADF 1…	F	5%
P	1	3.0917	3.0114
LQ	2	4.3815	3.0115
CF	3	5.0823	3.0114

The Classical Linear Regression Model (CLRM) built for Banks' Profitability is such that, if all other regressors are held constant, Profitability goes up by twenty three million, forty thousand three hundred and forty naira only if there is one million naira worth of increase in the banks operational activities considered for this research. Sufficient accounting information on all the regressors equally have increasing effect on the Banks' profitability.

The coefficient of determination (R^2) implies that a very huge proportion of 80.2 % of the variation in Profitability is explained by all the explanatory variables under consideration. The adjusted R^2 (0.160), Akaike info criterion (36.74) and Schwarz criterion (36.92) further confirmed the position of our R^2, which adjudged the model as a "best goodness of fit". The Durbin Watson result of 1.755924, within the context of sample size used for this research clearly shown the non existence of autocorrelation. The implication being that the model has been correctly specified.

The result of F statistic shows that all the regression coefficients are statistically significant at both 5% and 1% levels of significance for the years under consideration, hence we accept the hypothesis that sufficient accounting information have impacted significantly on banks' profitability.

Based on the ADF unit root test employed, the result in table 2 shows that stationery in profitability at first difference lag 1 were only accounted for by accounting information on Liquidity and Cash flow while other regressors became stationery after lag 1. The implication is such that only a short run relationship exists between banks' profitability and the former while the latter exhibited a long run relationship.

4. CONCLUSION

Within the context of the model fitted for this research, we can easily conclude that availability of sufficient accounting information have positively impacted on the Profitability of Nigerian banking industry and the implication of this is that pragmatic policy options need to be taken in the banking industry to effectively manage credit quality, cash flow among other explanatory variables (since they proxy accounting information management) in order to enhance banking industry performance in the country.

To this end accounting information management should be targeted more and seen as real reform in the banking industry so as to promote economic development in Nigeria.

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