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Does depositing money in bank impact economic growth? Evidence from Nigeria

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The aim of this study is to examine the role of banks deposit money in the growth of Nigerian economy. The study was based on time series; data for the study were sourced from the Federal Bureau of Statistics, CBN statistical bulletin which covered 1974 to 2010. The co-integration and error correction model and structural analysis were used, both ADF and PP was adopted in testing for the unit root. At the end of our analysis, we discovered that there exist a long-run relationship between the dependent and the explanatory variables. The results conform to the economic a priori expectation. Thus, policies that tend to increase the gross domestic product through the financial sector such as increase in banks deposit liability, low interest rate, high liquidity ratio were recommended for better economy.

Key words: Deposit money bank, co-integration, economic growth, money supply.

INTRODUCTION

In recent times, economic development has become a major social - political issue in the world debate. This is not due to any sudden discovery of the extent of poverty in the world, but rather to a change in social attitudes towards its existence. The facts on poverty and under-development have always been available, at least in general outline – for anyone who cared to look at them. The difficulty has been to get the governments and private individuals to regard alleviation of poverty as a condition that requires urgent and significant efforts. This view was not generally accepted until after the Second World War when most colonial territories had achieved political independence (Balwin, 2000). After becoming free of external control, these emerging nations immediately set out for higher living standards and most instituted domestic reforms designed to stimulate economic growth. The general belief of citizens of the new countries was that the developed countries had not only tended to neglect the economic welfare of most of the population in the less developed countries, but also that the advanced countries had used their greater economic and political power to obtain an unfair share of the income gains from doing business with the less developed nations (Balwin, 2000).

However, in order to address these challenges of under-development and chronic poverty in the third world countries, Nigeria inclusive, the financial system and in particular the deposit money banks have been identified as key elements in the development process and poverty alleviation. Deposit money banks in developing countries as elsewhere in the world are expected to play a crucial role and assist in economic development. It was in consonance with this overall need for faster economic growth and the critical place of deposit money banks in the process, that Nigerians made their first effort in 1928 to 1952 to start indigenous banks. This was against the background that expatriate banks were not giving favorable terms in their relationship with Nigerian businessmen (Adekanye, 2005). As a result of this, many Nigerian businessmen were unable to have access to loans and advances from these expatriate banks. The major reason given by the foreign banks was that Nigerian businessmen lacked collateral securities to support such loans and advances.

The activities of commercial banks as engine of growth of the economy could better be seen through the performance of their main function which include taking of deposits from the general public, providing account

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keeping and money transmission services and granting lending facilities (Crockett, 1970). Indeed, in an efficiently functioning financial system, the size of a bank's business, or that of any other financial intermediary, depends on its ability to attract funds in competition with other institutions (Crockett, 1970). This ability will depend on the attractiveness to depositors of the package of services it offers. This package will consist of the interest rate paid, security offered, convenience in account management facilities, financial advice etc.

Banks also play very important roles in the transmission of monetary policies. This is made possible by the fact that, the liabilities and assets of banks form a good part of the money supply through the money multiplier. For instance, if government intends to reduce the volume of money in circulation; the monetary authorities would achieve this by applying a set of contractionary monetary policies. On the other hand, expansionary monetary measures could be used to increase the supply of money and credits. In this respect, banks facilitate the process of macro-economic stability in the country.

There is a growing concern that deposit banks in Nigeria have not been living up to expectation in terms of service delivery, to their customers. Many people allege that these banks have abandoned their traditional banking functions in pursuit of short-term money spinning ventures like round tripping in foreign exchange, money laundering and other criminal tendencies, which are inimical to the growth of the economy. Since, most of the Nigerian banks are involved in these illegal ventures, which are short term in nature and usually unstable, illegitimate and often easily check-mated by government policies, the banks themselves have become unstable, and often suffer from financial crisis and sometimes outright failure. In the event of total failure, the depositors bear the brunt of huge losses of their monies. The meager payment of maximum of N50, 000 to depositors irrespective of the amount of deposits by Nigerian Deposit Insurance Corporation (NDIC) does little to mitigate such losses. This to a large extent has eroded the confidence of the banking public in Nigerian banks.

Consequently, the banking industry and in particular the commercial banks in Nigeria have failed to develop and impact positively on the economy as expected, even though commercial banking started in Nigeria over one hundred years ago. First Bank of Nigeria Plc was established in 1894. It is based on these facts that the researcher would focus on the activities of deposit money banks, with particular reference to deposit money bank in Nigeria and the contributions these banks are making or fail to make towards the economic growth and national development as the major objective of the paper.

Theoretical framework and literature review

Deposit money banks play a very significant role in economic growth, development and social mobilization. Bank failures experienced in the early nineties and their rippling effects on other sectors of the economy brought to the fore the strategic role of the sector. The nature of the financial services as well as the way the players in the banking system practice banking is such that depositors tend to panic whenever there is a little sign of distress in the system.

Principal amongst the functions performed by the commercial banks are to ensure the adequacy of the stock of money to service the needs of the economy and facilitate the transfer of money between economic units. This transfer is usually from areas of surplus to areas of deficits/needs. The system also helps to mobilize the collection and storage of savings (Nzotta, 2004). The provision of finance can retard economic growth and development if it is repressed or stimulate it if it is liberalized. This work was undertaken to carefully examine how the commercial banks perform their intermediation functions and to observe if the economy benefited from their activities.

Adam Smith in Ekundayo (1996) was quoted to have said that the trade of the city of Glasgow doubled in about fifteen years after the first erection of banks there and that the trade of Scotland had more than quadrupled since the first erection of two public banks at Edinburgh. And that banks had contributed a good deal to this increase could not be doubted (Ekundayo 1996). Based on the above statement, this study was predicated on the theory that there is a symbiotic relationship between financial/money markets and economic growth since well-developed financial/money markets are *since qua non* for the growth and development of the less development economies (LDCS) (Nnanna, 2004).

Nnanna (2004) stated that earlier studies conducted by Cameron (1967), McKinnon (1973), and Shaw (1973) provided the foundation for recent research on the link between banks and other financial institutions and the macro economy. Apart from studies conducted by Cameron and others, recent studies emerged which closely examined the relationship between the financial sector and real economic activities. This very interesting work also made reference to the study conducted by king and Levine (1993) which established that the banking sector's development was not only correlated with economic growth but also a cause of long-term growth. Subsequent works that built on the work of King and Levine, showed that financial/money markets were a source of economic growth. Other theoretical literature that explored the correlation between the banking sector and economic growth had been developed and suggested that the financial system could impact positively on real economic performance by affecting the composition of savings and in influencing the scope of credit rationing (Nnanna, 2004).

Development is often constrained by shortage of productive factors, a critical one being capital. One of the major goals of economic management therefore, is to

facilitate the process of capital formation. Capital accumulation for investment requires domestic savings or foreign assistance. Capital formation, whether financed from internal or external sources, requires the mobilization of economic surpluses. For investment to increase there must be a growing surplus over and above current consumption that can be channelled into productive uses. The different ways of accumulating capital entail different institutional arrangements. The banking system provides a major institutional mechanism for the mobilization of minuscule and not-so-minuscule resources from surplus units and for channelling of the same to the deficit units through the extension of credit.

Theory of financial intermediation

Financial intermediation theory was first formalized in the works of McKinnon (1973) and Shaw (1973) who see financial markets as playing a pivotal role in economic development, attributing the differences in economic growth across countries to the quantity and quality of services provided by financial institutions. This contrasts with Robinson (1952), who argued that financial markets are essentially handmaidens to domestic industry, and respond passively to other factors that produced cross-country differences in growth.

"There is a general tendency for the supply of finance to move with the demand for it. It seems to be the case that where enterprise leads, finance follows. The same impulses within an economy, which set enterprises on foot, make owners of wealth venturesome, and when a strong impulse to invest is fettered by lack of finance, devices are invented to release it… and habits and institutions are developed".

The Robinson school of thought therefore believes that economic growth will lead to the expansion of the financial sector. He attributed the positive correlation between financial development and the level of real per capital GNP to the positive effect that financial development has on encouraging more efficient use of the capital stock. In addition, the process of growth has feedback effects on financial markets by creating incentives for further financial development.

McKinnon's (1973) thesis is based on the complimentarily hypothesis, which in contrast to the neo-classical monetary growth theory, argued that there is a complementarily between money and physical capital, which is reflected in money demand. According to McKinnon (1973), complementarily links the demand for money directly and positively with the process of physical capital accumulation because "the conditions of money supply have a first order impact on decisions to save and invest". In addition, positive and high interest rates are necessary to encourage agents to accumulate money balances, and complementarily with capital accumulation will exist as long as real interest rate does not exceed the

real rate of return on investment. Furthermore, the lumpiness of investment expenditure implies that aggregate demand for money will be greater, the larger the proportion of investment in total expenditures.

Shaw (1973) proposes a debt intermediation hypothesis, whereby expanded financial intermediation between savers and investors resulting from financial liberalization (higher real interest rates) and development, increase the incentive to save and invest, stimulates investments due to an increased supply of credit, and raises the average efficiency of investment. The view stresses the importance of free entry into and competition within the financial markets as pre-requisites for successful financial intermediation.

McKinnon (1973) and Shaw (1973) argued that policies leading to repression of financial markets reduce the incentives, to save. They described the key elements of financial repression as:

(i) High reserve requirements on deposit
(ii) Legal ceilings on bank lending and deposit rates
(iii) Directed credit
(iv) Restriction on foreign currency capital transactions
(v) Restriction on entry into banking activities

Though the McKinnon-Shaw framework informed the design of financial sector reforms in many developing countries, however, country experiences later showed that while the framework explains some of the quantitative changes in savings and investments at the aggregate levels, it glosses over the micro-level interactions in the financial markets and among financial institutions which affect the supply of savings and the demand for credit by economic agents, and the subsequent effect on economic growth.

Economic growth models

The Neo-classical growth model

Until recently, growth theorizing was dominated by the Solow model, which was first proposed as an alternative to the Harold-Domar model, which holds that various steady state rates of growth are all independent of the rate of savings, even though the levels of the variables are affected by savings. Thus any increase in growth rates resulting from increased saving is only temporary, as under the framework; only through technological progress can continuous economic growth be achieved. Furthermore, Solow argued that exogenous technological improvement and capital accumulation drive economic growth. Based on his analysis of the American data from 1909 to 1949, he observed that 87.5% of growth of that period was attributable to technological change, and 12.5% to the increased use of capital. The result of the Solow growth model was that many came to believe that

financial markets had only minor influence on the rate of investment in physical capital, and the changes in investment were viewed as having only minor effects on economic growth.

Endogenous growth models

The body of literature that challenged the assumptions of the Solow model came to be known as endogenous growth model. Though the initial arguments was on "convergence" that is the inability of the Solow model to explain the diversity of the observed growth rates across countries. Various studies have incorporated the role of financial markets in the endogenous growth model. In an endogenous model of growth, it has been argued that financial development can affect growth in three ways; namely raising the efficiency of financial intermediation, increasing the social marginal productivity of capital and influencing the private savings rate. This makes well functioning financial markets at the core of endogenous technical progress because a well functioning financial system increases the efficiency of the human capital as well as the physical capital. Moreover, productive financial service improves and expands the scope of innovative activity. These have been confirmed by various studies.

Levine (1997) stressed the informational role of financial intermediation in an endogenous growth model and argues that its role is crucially related to productivity growth of capital. In a related study, Bencivenga and Smith (1991) stressed that through its reduction of liquidity risks, efficient financial intermediation stimulates savers to hold their wealth increasingly in productive assets, contributing to productive investment and growth. Levine (1997) followed the same line of thought, but stressed the importance of stock markets in stimulating the financing of investment in less liquid investment projects, as well as the diversification of portfolio risk. In addition, he explicitly modelled a two-way relationship between financial markets and economic growth. Saint-Paul (1992) also emphasized the development of a well functioning stock market in stimulating economic growth, especially as it affects the sharing of risks of entrepreneurs. The endogenous growth model provides an understanding of the importance of financial development in economic growth; a point often obscured in the neoclassical growth models.

Theories of mobilization of savings

Mobilization of savings is one of the major functions of financial institutions. By mobilizing the savings of millions of savers in an economy and the channelling of same to the deficit spending units, the funds or capital needed for economic growth and development is enhanced. Saint-Paul (1992) identified capital accumulation as a major determinant factor in the development process in relating the growth rate of an economic output to that of its capital stock. They pointed out the dual role of capital as creating productive capacity and effective demand.

In their model, capital stock (investment) was assumed to be equal to saving that is I = S. According to Harrod, who viewed an increase in capital stock as synonymous with investment, is a dependent factor of the rate of growth of income, which determines the level of savings.

Financial repression hypothesis

This theory is usually associated with the works of Cameron et al. (1973), McKinnon (1973) and Shaw (1973), and holds that financial development would contribute most significantly to economic growth if the authorities were not to interfere in the operations of the financial institutions. Poor performance by banks and other financial institutions is thus often attributed to interest rate regulation, ceilings on deposit and loan rates and official guidelines pertaining to lending operations. Such interference results in a low and often negative real rate of return on financial assets and therefore, in deficient savings being mobilized and channeled into investment projects (Agu, 1988).

The proponents of this hypothesis therefore advocate a positive real interest and financial liberalization. Free market forces would then ensure an optimal financial structure for development and eliminate the fragmentation of markets that is financial dualization and all the attendant distortions of the proper operation of the market mechanism. According to the financial repression hypothesis, government legislation and policies may distort the operation of the market mechanism in determining the "prices" of financial resources. As the major effects of such repression are limited savings because of interest ceilings, the hypothesis can be ultimately reduced to official interest rate policies. It is however, recognized that other forms of financial repression might result from such other factors as portfolio regulation and oligopolistic financial markets (Galbis, 1982). The financial repression hypothesis also focuses attention on the level of interest rates on the savings instruments available to the public in relation to the rate of inflation. If real rates of interest have been positive over a period of time, it may be said that there has been no financial repression, but financial deepening.

Deposit money banks and economic development

The development of banking and growth of modern economies seems inseparable. Until the late seventh century, there had existed no modern banking institution anywhere in the world, and there had no modern

developed economy. There are many factors which determine the level and interest rate of development of an economy. These include the natural resources endowment, supply of skilled labour and, of course, capital. Capital is critical factor required in the process of economic development. This includes real capital such as machineries and equipment and financial capital. The quantum of financial capital required before there could be any meaningful economic development also underscores the importance of banks. An individual's savings are not usually large enough to procure all his needed resources for development. The saver may not also possess the ability and the initiative that investment calls for.

The banks therefore, aggregate the small savings of the individuals and hold these, away from the consumption, ready for investment. Consequently; invest-ment in large physical projects is possible because qualified investors have access to the substantial stock of funds in temporary residence with the banks. This inter-mediation function of the banks facilitates development as it encourages savings and investments both of which are economically very rewarding. Banks also influence the quantum of purchasing power available for the investment and consumption expenditures. The banks do this through their power to expand or contract credit. By their policies, banks also affect (e.g. prices of the various financial claims) the direction of funds to alternative uses. The banks determine whether credit will be available for financing investment in agriculture, industry or consump-tion. How banks perform this role affects the pace and pattern of development in different sectors of the economy. Banks are very different from other financial intermediaries because of the "high degree of liquidity" of their demand deposits as well as their ability to "create" and "destroy" money. In a modern economy, the greater proportion of the money supply is deposit money created by commercial banks. Banks, as a group, therefore constitute the principal supplier of the medium of exchange.

METHODOLOGY

The model for our empirical study will be based on the liquidity management and financial intermediary's theories. The dependent variable will be gross domestic product (GDP) while commercial banks credit (LNCBC), Change in interest rate (INT), commercial banks deposit liabilities (DLCB) will be the explanatory variables. GDP will serve as an index of economic growth and development, while the explanatory or independent variables will be used to measure the role of commercial banks in the economic growth in Nigeria.

The secondary data for the period of 1974 to 2010 which were used as the macroeconomic variables in this study were obtained from the Statistical Bulletin of the Central Bank of Nigeria. The choice of this intervening period is informed by the following reasons: The numerous banks failure and the unstable nature of the financial system, and availability of data in Nigeria, and desire to capture the period of structural break-control regime vis-a-vis

deregulation and reforms. Hence we specify the variable model as:

$$GDP = (CBC, INT, DLCB)$$

$$GDP = C_o + C_1 CBC + C_2 INT + C_3 DLCB + U_t \tag{1}$$

C_o is intercept and, C_1, C_2, C_3 are the coefficients of the regression equation.
A priori it is expected that $C_1 < 0$, c_2 and $c_3 < 0$:

Where gross domestic product (GDP) is the dependent variable, commercial banks credit (CBC); INT is interest rate, deposit liabilities of commercial (DLCB) are the independent variables, and U_t is error term.

ESTIMATION TECHNIQUE - COINTEGRATION AND ERROR CORRECTION MODEL (ECM)

We first investigated the time series characteristics of the data to test whether these variables are integrated. The augmented Dickey-Fuller (ADF) test (as specified in Dickey and Fuller, 1979), and Phillips-Perron test (Phillips and Peron, 1988) were employed. For the ADF, the null hypothesis is that the variable being considered has a unit root against an alternative that it does not. The model for the ADF is as specified as follows:

$$\Delta y_1 = \alpha + \beta T y y_{1-1} + \sum\nolimits_{1=1}^{p} d_1 \Delta y_{1=1} + \varepsilon_1 \tag{2}$$

Where y is the variable considered, T is the time trend (which is only allowed if significant), and ε_1 is a random error term. The Akaike Information Criterion is used in selecting p (the lag-length) after testing for first and higher order serial correlation in the residuals. The lagged variables serve as a correction mechanism for possible serial correlation. The Phliips-Peron (PP) test uses models similar to the Dickey-Fuller tests but with Newey and West (1994) non-parametric correction for correcting possible serial correlation rather than the lagged variables method employed in ADF. Also Bartlett Kernel (Andrews, 1991) is used as an automated bandwidth estimator for lag truncation of the Newey and West non-parametric correction. The test statistics of the PP has the same distribution as that of Dickey-Fuller and critical levels provided by MacKinnon (1996) are used.

If the variables in the structural equations have unit roots, then we can capitalize on the likelihood of co-movements in their behaviour hence the possibilities that they trend together towards a stable long-run equilibrium. The multivariate maximum likelihood approach to co-integration developed by Johansen (1988, 1991) makes it possible to test for the co-integration rank that is the number of co-integrating vectors, to estimate these vectors and to test linear restrictions on the vectors using standard asymptotic inference. In addition, the small sample biases and normalization problems inherent in the OLS approach do not arise in the Johansen method.
If we assume that the vector X_t contain k time series variables with T observations each, the Johansen method is based on the following p-lag vector-autoregressive (VAR) model for X_t with Gaussian errors:

$$X_1 = X_1 = \pi X_{1-1} + \dots + \pi_p X_{1-p} + \varepsilon_1 \tag{3}$$

The π matrices are of order (k × k) and contain the VAR parameters. In addition each and every variable is explained by p-lagged values of itself and all the other variables. By implication, all

The variables are regarded as endogenous. We can then reparameterize equation (25) into the error correction model (ECM) formulation to yield:

$$\Delta X1 = \sum_{t-1}^{P-1} \pi_1 \Delta X_{t-1} = \pi X_{t-1} + \varepsilon_1 \qquad (4)$$

Where $\pi_1 = -(\pi_{t+1}....+ \pi_p)(i=1,....p-1)$ and $\pi = -1 +, +...+$ p. As long as X_{t-1} is stationary, the ECM is well defined, since X_t is stationary. Stationarity of $X_{t=1}$ is equivalent to linear combinations of the X_t variables being stationary, that is, co-integration. Thus, the nature of the error-correction term, X_{t-1} is what determines the nature of the co-integration relationships among the variables (Engsted and Bentzen, 1997).
Specifically, the number of independent stationary linear combinations is determined by the rank, *r,* of the $(k \times k)$ matrix π:

If r = 0, ?? π is just the null matrix, which implies that the model reduces to a vector auto regression (VAR) in first differences. Hence, all the variables in X_t are 1(1) but there is no cointegration, that is, no long-run relationships between the variables.

If 0<r< k, such that π has reduced rank greater than zero, then X_t is 1(1) and there are r cointegrating vectors.

(3) If r = k, such that π has full rank, X_t can be said to be trivially co-integrated because all the variables in X_t are stationary,:1(0), and hence any linear combinations of the X_t variables is trivially stationary.

The number of non-zero eigen values from the co-integrating equations usually denotes the co-integration rank, that is, the number of co-integration relationships in the system. Two tests exist for the rank of π, r, based on eigen values test (L_{max}), and the trace test (L_{trace}). Having determined the co-integration rank, π can then be partitioned as $= \alpha \beta$, where β is a $(k \times r)$ matrix whose columns are the co-integration vectors, and a is the corresponding $(k \times r)$ matrix of so-called factor loadings. The interpretation of the factor loadings is that they measure the speed with which the variables change in response to short-run deviations from the long-run equilibrium given by the co-integration vectors in β .
The general form of the error correction model for the structural equations can therefore be expressed as;

$$LnY_t = \sum_{K=1}^{r} \alpha_1, k^{V_k}, 1\text{-}p + \sum_{s=1}^{p} \emptyset_{1, s} Ln \Delta X_{1t-s} + \sum_{s=1}^{p} \emptyset_2,$$
$$_{s}Ln \Delta X_{2t-s} + \sum_{s=1}^{} \emptyset_{3, s} Ln \Delta X_{3t-s} + \pi 1, t+ \mu t...(5)$$

where Y_t is the dependent variable; X_1, X_2; and X_3 are the independent variables in the structural equations; p is the optimal lag length of the VAR, $\alpha_{1 k}$ = the adjustment coefficients, $V_{k,t-p}$ = the co-integrating vector and μ_1 = intercepts.

Equations 2 describe the Intertemporal interaction between the dependent variable and the independent variables highlighted in the last section. If the co-integrating relations (equilibrium conditions)

are imposed, the error correction models describe the way aggregate dependent variable and the independent variables will adjust towards their equilibrium state in each time period. In the short-run, deviation of dependent variable and the independent variable from their long-run equilibrium path will feed back on their future changes in order to force their movement towards the long-run equilibriul1 state since the variables are supposed to be co-integrated. The co-integration term is known as the error correction term since the deviation from lung-run equilibrium is corrected gradually through a series of partial short-run adjustments. The co-integrating vectors from which the error correction terms are derived each indicating an independent direction where a stable, meaningful, long-run equilibrium state exists. The coefficients of the error-correction terms, however, represent the proportion by which the long run disequilibrium in the dependent variables is correct in each short-term period.

After establishing the unit root status of the variables and the existence of co-integration, the ordinary least square (OLS) two stage approach suggested by Engle and Granger (1987) was utilized in deriving the short run coefficients. In the first stage, the long run OLS equation was conducted. The estimates from the OLS estimates therefore represent the long run coefficients. Thereafter, the general to specific approach was utilized to arrive at the parsimonious equation for each of the structural equation in the model. The redundant variables are deleted using the Akaike Information Criteria (AIC) and the Schwarz Criteria (SC).

Structural analysis - impulse response analysis and forecast error variance decomposition

A shock to any variable in the VEC model not only directly affects the variable but is also transmitted to all of the other endogenous variables through the dynamic (lag) structure of the VEC. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables. While impulse response functions trace the effects of a shock to one endogenous variable on to the other variables in the VEC, variance decomposition separates the variation in an endogenous variable into the component shocks to the VEC. Thus, the variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VEC.

PRESENTATION AND DISCUSSION OF RESULTS

The characteristics of the data series used in the regression analysis are presented in Table 1. Table 1 reports the summary of statistics used in the analysis. It provides information about the means and standard deviations of the main variables. The mean value of log of trade balance stood at 0002062 while the mean of the log of fiscal deficit, domestic credit and external debt stood at 0.111, 10.69699 and 10.103 respectively.

The variables for our analysis were subjected to two types of unit roots test to determine whether they are unit roots or stationary series. The tests employed were the Augmented Dickey Fuller test (ADF) and the Phillips-Perron (PP) test. For the ADF and PP' tests, two models are considered viz, with constant, with time trend. The null in both the AD and PP test is the presence of unit root. The ADF results in Table 2 show that 99% of the variables are integrated of order one in the two models

Table 1. Summary of statistics of variables applied in the regression analysis.

	Mean	Median	Maximum	Minimum	Std. Dev.	Obs
LINT	10.10308	10.45416	10.57244	8.922559	0.546046	37
LDLCB	10.69699	10.67239	12.24385	9.000304	1.071984	37
LCBC	0.111193	0.066115	0.50274	-0.37609	0.182012	37
LGDP	-0.02962	0.058515	0.194715	-0.49138	0.192021	37

Source: Author's computation with data derived from CBN statistical bulletin using Econometric Views 6.0.

Table 2. Observed result of the Augmented Dickey Fuller test (ADF)*.

Variable	Level	First diff.
LDLCB	-0.56645	-4.54233
LINT	-3.13116	-1.81189
LCBC	-3.20642	-5.84943
LGDP	-1.83802	-5.20265

Source: Author's Computation with data derived from CBN statistical bulletin using Econometric Views 6.0
*The Null Hypothesis is the presence of unit root. Model 1 includes a constant while model 2 includes a constant and a linear time trend. Lags were selected based on Schwarz Information Criterion. *, **, *** indicate significance at 1, 5, and 10% respectively. Econometric views were used in the derivation.

Table 3. Observed result of the Phillips-Perron test (PP)*.

Variable	Level	First diff.
LDLCB	-0.56645	-4.52797
LINT	-2.92619	-5.27047
LCBC	-3.17008	-13.1983
LGDP	-1.95716	-5.21298

Author's Computation with data derived from CBN Statistical bullet using Econometric Views 6.0
*The Null Hypothesis is the presence of unit root. Model 1 includes a constant, Model 2 includes a constant and a linear time trend. The Bandwidth was chosen using Newey-West method with Barttlet Kernel spectral estimation *, * *, * * * indicate significance at 1 %, 5%, and 10% respectively. Econometric views was used in the derivation.

of unit root test considered. A reasonable number of the variables were at the 5% level. One exception was however observable, the log of interest rate (INT). The LINT was found to be stationary in the model that includes a constant without a linear time trend at levels. The LDLCB was found to be stationary and significant at 5% level in the model that includes only a constant and a linear time trend at levels but significant in the model that

includes only a constant. One interesting feature noted in the results was that all the variables were stationary in model with constant as well as constant and linear time trend at the first difference level.

The PP test statistics reported in Table 3 reinforces the result in the model that include only constant in the ADF test and also supported those models that include a constant and a linear time trend. The PP test supports the presence of unit roots in nearly all the series. The few exceptions that were noticed in the ADF model however remain. For example, the LINT was found to be stationary in the model that includes a constant without a linear time trend at levels. These two variables are significant at 10% level. It is evident from Tables 2 and 3 that the variables become stationary series when appropriately differenced. From the two types of integration tests carried out (above), it could be concluded that all the variables in our models contain unit roots. Therefore, we can safely proceed to use the co-integration method in analyzing our models as conventional regression models will generate spurious results due to the integration level of the series. Following that findings that the data series are by nature, mostly non-stationary stochastic processes, econometric developments regarding the concepts of co-integration are particularly opposite in testing for equilibrium. Accordingly, the long run properties of the variables in the behavioural equations were examined using the Engle and Granger two-step procedure.

Presented in Table 4 are the results of the unit root tests of the residuals of the static long run models. The regression residuals have zero mean, and as they are not expected to have deterministic trend, the unit roots exercise were conducted by excluding both the models that includes constant and constant with time trend. The ADF test statistics and the Phillip-Perron statistics suggest that the disequilibrium errors are mostly 1(0), and as such, the variables in the static equations are co-integrated.

In view of the problems with the Engle and Granger framework for testing co-integration, the results were validated using the Johansen (1991, 1995) approach. The Johansen's framework provides the number of co-integrating equations and estimates of all co-integrating vectors in the multivariate case. The Johansen co-integration test results are presented in Tables 5. The trace test and the max-eigen test were conducted to

Table 4. Observed result of the unit root test of residual of ECM variables.

Equation	Augmented Dickey Fuller test	Phillips - Perron test
Deposit money bank equation	-6.3701	-6.3701

Source: Author's Computation with data derived from CBN Statistical bulletin using Econometric Views 6.0.
Note: (l) Lags were selected based on Schwarz Information Criterion in the ADF test (2) The Bandwidth was chosen using Newey-West method with Barttlet Kernel spectral estimation in the Phillip-Perron test (3) *, **, *** indicate significance at 1%, 5%, and 10% respectively. Econometric views was used in the derivation.

Table 5. Table of observed result of the Johansen multivariate co-integration test.

Sample (adjusted): 1971 2010
Included observations: 36 after adjusting endpoInts
Trend assumption: Linear deterministic trend
Series: LGDP LCBC LINT, LDLCB
Lags interval (in first differences): No lags
Unrestricted Co-integration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical value	1% Critical value
None *	0.571655	49.56915	47.21	54.46
At most 1	0.273115	19.04739	29.68	35.65
At most 2	0.168	7.563864	15.41	20.04
At most 3	0.025844	0.942635	3.76	6.65

Trace test indicates 1 co-integrating equation(s) at the 5% level
Trace test indicates no co-integration at the 1% 1evel

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical value	1% Critical value
None *	0.571655	30.52176	27.07	32.24
At most 1	0.273115	11.48325	20.97	25.52
At most 2	0.168	6.621229	14.07	18.63
At most 3	0.025844	0.942635	3.76	6.65

Max-eigenvalue test indicates 1 co-integrating equation(s) at the 5% level
Max-eigenvalue test indicates no co-integration at the 1% 1evel

Source: Author's Computation with data derived from CBN Statistical bullet using Econometric Views 6.0.

establish the number of co-integrating relations in each of the equations. The trace test results are presented in the first part of the table while the max-eigen results were presented in the second part of the table. Test results indicate the existence of one co-integrating equation in the equations at the 1 and 5% significance level. In addition, the normalized co-integrating coefficients show that the variables in the equations are relatively important. The consistency in the test results confirms the existence of long run relationship among the exogenous and dependent variables in the model.

As the data series are non-stationary and the vector of variables in the equations appear to be co-integrated, execution of the second phase of the Engle and Granger technique led to the estimation of error-correction forms

of the stochastic equation. The equation represents the short-run behaviour the adjustment to the long run model. The residual from the co-integrating regression lagged one period were used as error correction mechanism in the dynamic equation. The Ordinary Least Square (OLS) estimation method was used as it is an essential component of most other estimation techniques. In addition, the OLS remains one of the most commonly used methods in econometric investigations involving large models. Estimates of the preferred specification obtained using general-to-specific method are presented in Table 6. The results were evaluated using conventional diagnostic tests.

The general discussion of the error correction model is useful here. All the diagnostic test statistics are quite

Table 6. Parsimonious model.

Dependent variable: D(LGDP)				
Method: Least squares				
	Coefficient	Std. error	t-Statistic	Prob.
C	0.016147	0.031130	0.518700	0.6087
D(LCBC)	0.169088	0.109724	1.941028	0.1364
D(LCBC(-1))	0.086906	0.096814	-0.897661	0.3783
D(LCBC(-2))	0.326216	0.094313	-3.458867	0.0020
D(LINT(-1))	0.411203	0.161617	-2.544307	0.0178
D(LDLCB)	0.208358	0.224477	-0.928192	0.3625
D(LDLCB (-3))	0.204215	0.201566	1.013144	0.3211
D(LGDP(-I)	1.265832	0.395731	3.198718	0.0039
ECM3(-1)	-0.640580	0.427420	-3.136448	0.0045
R-squared	0.577013	Mean dependent var.		-0.005699
Adjusted R-squared	0.436017	S. D. dependent var.		0.105492
S.E. of regression	0.079223	Akaike info criterion		-2.006092
Sum squared residue	0.150632	Schwarz criterion		-1.597953
Log likelihood	42.10052	Durbin- Watson stat		2.101359
F -statistic	0.003406			

Source: Author's computation with data derived from CBN Statistical bulletin using Econometric Views 6.0.

satisfactory. The magnitude of the coefficients confirms the absence of redundant regressor. Judged by the significance of the t-statistics, the coefficients are well determined. The disequilibrium error term, ECM_{t-l}, is statistically significant and negative (as expected) in the equation. The significance of the error terms confirms the existence of long run relationship between the variables in the error correction model. Of particular interest is the coefficient on the lagged ECM in the inflation equation. The ECM induces about 64% adjustment per period in these equations. In addition, the equation is statistically significant and the overall statistical fit is good. The marginal significance level of the F-statistics is zero. Hence, the null hypothesis of the F-statistics is rejected for all choices of significance level. Therefore, the conclusion is that, as groups, the regression coefficients are significantly different from zero. The high value of the Durbin-Watson (DW) indicates absence of auto-correlation. Finally, the relatively low value of the stan-dard error of the regression is a clear evidence of the goodness of fit of the equation.

Deposit money banks response to economic growth (Table 6). The adjusted R-squared is 0.436. However, the sample F-statistic has a highly significance level of 0.003. Adjustment to equilibrium is reasonably fast, about 64%. The coefficients of deposit money banks are positive and significant in line with the theoretical expectation. This is however, with an adjustment lag of two-period at the 1% level of significance. A I% increase in deposit money banks is capable of increasing economic growth by 0.326%. Judged by its coefficients, the value of interest rate in the immediate past period also has a role to play in the movements of Nigerian economy. The deposit money banks variables exert a modest influence on the GDP.

CONCLUSION

This study is an attempt to investigate the long relationship between deposit money bank and economic growth in the Nigerian context from 1974 to 2010. After establishing the unit root status of the variables ill the structural equation and the existence of cointegration, the ordinary: least squares (OLS) two-stage approach and suggested by Engle and Granger (1987) was utilized in deriving the short run and long run estimates. The structural analysis was done using the Impulse Response Analysis and Forecast Error Variance Decomposition to trace the one-time shock to one of the innovations in the current and future values of the exogenous variables. Empirical evidence emerges that money deposit banks in Nigeria was found to respond to economic growth.

This study was undertaken to assess the role of deposit money banks in growth of Nigerian economy. The main objective is to ascertain the extent to which deposit money banks activities have affected the Nigerian economy. Several relevant theories such as the theory of money creation, money multiplier theory, theory of financial intermediation, money supply, mobilization of savings were examined. The empirical model was based in the combination of the different theories examined.

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