Financial Deepening and Economic Growth in Nigeria, 1986-2011: An Empirical Investigation

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Abstract

The paper assessed the level of development of financial deepening in the banking sector and the extent it has impacted on economic growth over the last two decades. Vector autoregressive (VAR) methodology and its derivatives, impulse response function and variance decomposition, were employed that enable us to scrutinize the relationship between financial deepening and economic growth. The findings show that the series are co-integrated and that long run relationship existed between the variables. The results of the VAR estimates revealed among other things that a one year lag of economic growth, gross national saving as a ratio of GDP (lag 1) and exchange rate (lag 1) have significant positive impact on current economic growth while the impact of GCF (lag 1) on the current level of economic growth was negative and statistically significant. It was also empirically discovered that PSC/GDP (lag 2) and GNS/GDP (lag 2) happened to be key determinants of M2/GDP. Similarly, the key determinants of PSC/GDP include its year 1 and 2 lagged values and GNS/GDP (lag 2) with GNS/GDP (lag 2) and PSC/GDP (lag 2) exhibiting negative impact. Finally, on the current level of GNS/GDP, it is observed that M2/GDP (lag 1) and PSC/GDP (lag 2) exhibit significantly negative determining influence while PSC/GDP (lag 1) and the past value of GNS/GDP (lag 2) were also seen as its key determinant. These findings are further corroborated by the results of the impulse response function and variance decomposition. Among the recommendations of the study are that savings should be stimulated in order to place more funds in the hands of banks to intermediate investors seeking funds. Also, lending rate should be reasonable so as not to deter investors to borrow to embark on viable investment projects.

Key Words: Financial Deepening, Financial Intermediations, Vector Autoregressive, Variance Decomposition and Impulse Response Function

1.0 Introduction

The link between financial deepening and economic growth has long received significant attention in the literature. This attention is well-justified, since a better understanding of how the financial sector contributes to economic growth has important regulatory implications.

Within the finance-growth nexus literature, some have argued that financial intermediaries mobilize, pool and channel domestic savings into productive capital and contribute to economic growth. If this view is to be accepted, then a competitive and well-developed banking sector must be an important contributor to economic growth. In a competitive banking sector however, borrowing rates are higher and lending rates are lower and thus the transformation of household savings into productive capital investment is faster. On the other side of this debate is an argument that financial deepening is a consequence, and not a cause, of economic growth. In this view, economic growth increases demand for sophisticated financial instruments, which in turn leads to growth in the financial sector (Ardic andDamar, 2006).Well-functioning financial institutions enhance overall economic efficiency, create and expand liquidity, mobilize savings, promote capital accumulation, transfer resources from traditional (non-growth) sectors to the more modern growth-inducing sectors, and also encourage a competent entrepreneur response in these modern sectors of the economy.

Influenced by the preponderance of such theoretical reasoning, along with repeated recommendations of key world organizations like the World Bank and the International Monetary Fund, the government of Nigeria has recently paid a great deal of attention to expanding the breadth and depth of its financial market. Examples of such recent financial developments include facilitating consolidation of the banking sector, continuous deregulation of bank lending and deposit interest rates, rapid use of credit and debit cards, increasing use of payment technologies like ATM machines and electronic transfer of deposits, expanding internet banking services, e-banking, and mobile banking technology etc. Prior to June, 2004, there were eighty-nine commercial banks, among other financial intermediaries, with capitalization of less than 10 million USD and 3,330 branches, with the top ten banks accounted for about 50 percent of the industry's total assets/ liabilities (Soludo, 2004), a development considered unhealthy for the Nigerian economy. Besides the poor capital base, there are other issues hindering the effective performance of these banks. Some of the issues include inefficiency in management, operational incompetency, poor corporate governance and unhealthy competition.

Thus, these culminated in gross performance, which was below expectation which hindered the financial sector from delivering financial services optimally to the satisfaction of both investors and customers (Shittu, 2012). The Central Bank of Nigeria (CBN) has been trying hard to ensure that the financial sector in Nigeria maintain a considerable depth and remain liquid with a view to competing effectively within the global financial market. In 2004, the CBN carried out a far reaching reform. The reform exercise led to the increase in the minimum capital requirements for the commercial and micro-finance banks respectively. At the end, there were 25 commercial banks. This was further reduced to 24 banks at the end of December 2007 with the emergence of Stanbic Bank Plc and IBTC Bank to form Stanbic IBTC Bank Plc. In the post consolidation era, there are fewer banks now with improved minimum capital requirement of ₦25 billion each. Unfortunately, the fear of systemic risk lingers, the supply of credit to investors is still questionable, while the country's economic growth is relatively low.

Recently, the impact of financial intermediation on the growth of an economy generated a heated debate. While some studies opined that financial intermediation drives economic growth (see Nieh, *et al*., 2009, Islam and Osman; 2011, Shittu, 2012), others have argued that economic growth drives financial intermediation. However, there are studies, which have argue that a bi-directional causality exists between financial intermediation and economic growth (see Odhiambo; 2011) with many of these study applying causality test and error correction mechanism (see Shittu, 2012 and Odeniran and Udeaja, 2010).

The present study departs from previous studies in that we investigated the extent of financial deepening on economic growth considering the fact that Nigeria still experiences high level of unemployment, high poverty level, high inflation rate, wide disparity between the lending and deposit rates. The vector autoregressive (VAR) methodology cum impulse response function and variance decomposition rarely used in finance literature were employed to see the shock occasioned by financial deepening on economic growth in Nigeria.

Thus, the sequence of the study is clear. The paper is divided into five sections. Following the introduction, section two embarks on review of related literature. In section three, the methodology of the study is unveiled while section four discusses the results of findings. Section five ends the study with concluding remarks.

2.0 Conceptual Literature

The level of financial deepening reflects the soundness of the financial sector and the ability with which credits are created with respect to lending and deposit rates. Financial deepening theory thus defines the positive role of the financial system on economic growth by the size of the sector's activity. That means that an economy with more intermediary activity is assumed to be doing more to generate efficient allocations. In development studies, financial deepening is very often refers to the increased provision of financial services with a wider choice of services geared to the development of all levels of society. The size of the financial sector is usually measured by two basic quantitative indicators: "monetization ratio" and "intermediation ratio". Whereas monetization ratio includes money-based indicators or liquid liabilities like broad money supply to GDP ratio, intermediation ratio consists of indicators concerning to bank-based measures like bank credit to the private sector and capital market-based measures such as capitalization ratio of stock market(Ndebbio, 2004). The financial system comprises various institutions, instruments and regulators. It refers to the set of rules and regulations and the aggregation of financial arrangements, institutions, agents that interact with each other and the rest of the world to foster economic growth and development of a nation (CBN, 1993).

According to Ndebbio (2004), economic growth and development of a country depends greatly on the role of financial deepening. He argued what is important is what constitutes the financial assets that wealth-holders must have as a result of high per capita income. It is only when we can identify those financial assets can we be able to approximate financial deepening adequately. In short, and for our purpose, financial deepening simply means an increase in the supply of financial assets in the economy. Therefore, the sum of all the measures of financial assets gives us the approximate size of financial deepening. That means that the widest range of such assets as broad money, liabilities of non-bank financial intermediaries, treasury bills, value of shares in the stock market, money market funds, etc., will have to be included in the measure of financial deepening (Ndebbio, 2004). To simply pick the ratio of broad money (M2) to gross domestic product (Y), as done in this study, is because of lack of reliable data on other measures of financial assets likely to adequately approximate financial deepening in most SSA countries including Nigeria.

It is important to note that if the increase in the supply of financial assets is small, it means that financial deepening in the economy is most likely to be shallow; but if the ratio is big, it means that financial deepening is likely to be high. Many other authors have also defined financial deepening. The World Bank (1989:27) defines it as an increase in the stock of asset. Contributing, Shaw (1973:8) sees it as a process involving specialization in financial functions and institutions through which organized domestic institution and markets relate to foreign markets.

He stressed that an increase in the real size of the monetary system will generate opportunity for the profitable operation of other institutions as well via bill dealers to industrial banks and insurance companies. Opinionating, Nnanna and Dogo (1998) said that financial deepening often refers to a state of an atomized financial system, meaning a financial system that is largely free from financial repression. Financial deepening thus is the outcome of accepting appropriate real finance policy such as relating real rate of return to real stock of finance.

Financial deepening generally entails an increased ratio of money supply to Gross Domestic product (Nnanna and Dogo,1998; Nzotta, 2004). Financial deepening is thus measured by relating monetary and financial aggregates such as M1, M2 and M3 to the Gross Domestic Product (GDP).Thus, the definition of financial deepening in literature reflects the share of money supply in GDP. The most classic and practical indicator related to financial deepening is the ratio of M2/GDP which means the share or M I + all time-related deposits and non-institutional money market funds to GDP in a certain year. M1, M2, M3 are all measures or money supply, that is the amount of money in circulation at a given time. The logic here is that the more liquid money is available to an economy, the more opportunities exist for continue growth of the economy. How does this come about? Deep and mature financial markets are indispensable for economic development Olofin and Afangideh (2010) and Levine (2002).

2.3 Finance-Growth Theoretical Literature

2.3.1 Supply - Leading Hypothesis

The supply-leading hypothesis suggests that financial deepening spurs growth. The existence and development of the financial markets brings about a higher level of saving and investment and enhance the efficiency of capital accumulation. This hypothesis contends that well-functioning financial institutions can promote overall economic efficiency, create and expand liquidity, mobilize savings, enhance capital accumulation, transfer resources from traditional (non-growth) sectors to the more modem growth inducing sectors, and also promote a competent entrepreneur response in these modern sectors of the economy. The recent work of Dernirguc-Kunt& Levine (2008) in a theoretical review of the various analytical methods used in finance literature, found strong evidence that financial development is important for growth. To them, it is crucial to motivate policymakers to prioritize financial sector policies and devote attention to policy determinants of financial development as a mechanism for promoting growth.

2.3.2 Demand - Following Hypothesis

The demand-following view of the development of the financial markets is merely a lagged response to economic growth (growth generates demand for financial products). This implies that any early efforts to develop financial markets might lead to a waste of resources which could be allocated to more useful purposes in the early stages of growth. As the economy advances, this triggers an increased demand for more financial services and thus leads to greater financial development.

Some research work postulate that economic growth is a causal factor for financial development. According to them, as the real sector grows, the increasing demand for financial services stimulates the financial sector. It is argued that financial deepening is merely a by-product or an outcome of growth in the real side of the economy, a contention recently revived by Ireland (1994) and Demetriades and Hussein (1996). According to this alternative view, any evolution in financial markets is simply a passive response to a growing economy.

2.4 Empirical Literature

Darrat (1999) investigates the role of financial deepening in economic growth in the middle-eastern countries (Saudi Arabia, Turkey and the United Arab Emirates). The study focused on the causal link betweendegreeoffinancialdeepeningandeconomicgrowthinordertodiscriminate between several alternative theoretical hypotheses. The study employed multivariate granger-causality tests within an error-correction framework. The result generally support the view that financial deepening is a necessary causal factor of economic growth, although the strength of the evidence varies across countries and across the proxies used to measure financial deepening. The causal relationships are also predominately long-term in nature.

Darrat and Al-Sowaidi (2010) assess the role of information technology and financial deepening in Qatar, a fast growing economy. The study employs vector-error-correction modeling technique with its attendant short-run causal dynamics and found that real economic growth in Qatar is robustly linked over the long-run to both financial deepening and information technology and concluded that financial development, rather than IT, is more critical for enhancing economic growth over the short-run horizon. Ardic and Damar (2006) analyze the effects of financial sector deepening on economic growth using a province-level data set for 1996-2001 on Turkey. The period covered was associated with a weakly regulated and relatively unsupervised expansion of the banking sector which led to the 2001 financial crisis. The results indicate that a strong negative relationship between financial deepening, both public and private, and economic growth exists. The study argues that it is possible that financial development may not always contribute to economic growth, and the conditions under which such a contribution takes place should be investigated further.

Guryay, et al., (2007) examine the relationship between financial development and economic growth. The study employed ordinary least squares technique to show that there is insignificant positive effect of financial development on economic growth for Northern Cyprus. They posit that causality runs from growth to financial development without a feedback.

Wadud (2005) examines the long-run causal relationship between financial development and economic growth for three South Asian countries namely India, Pakistan and Bangladesh. He disaggregated financial system into “bank-based” and “capital market based” categories. The study employed a co-integration vector autoregressive model to assess the long-run relationship between financial development and economic growth. The empirical findings suggest that the results of error correction model indicate causality running from financial development to economic growth. Waqabaca (2004) examines the causal relationship between financial development and growth in Fiji using low frequency data from 1970 to 2000. The study employed unit root test and co-integration technique within a bivariate VAR framework. Empirical results suggest a positive relationship between financial development and economic growth for Fiji with causality running from economic growth to financial development. He posits that this outcome is common with countries that have less sophisticated financial systems.

Odiambho (2004) investigates the role of financial development on economic growth in South Africa. The study uses three proxies of financial development namely the ratio of M2 to GDP, the ratio of currency to narrow money and the ratio of bank claims on the private sector to GDP against economic growth proxied by real GDP per capita. He employed the Johansen-Juselius co-integration approach and vector error correction model to empirically reveal overwhelming demand-following response between financial development and economic growth. The study totally rejects the supply leading hypothesis.

In Nigeria, Nzotta and Okereke (2009) examine financial deepening and economic development in Nigeria between 1986 and 2007. The study made use of time series data and two stages least squares analytical framework and found that four of the nine variables; lending rates, financial savings ratio, cheques/GDP ratio and the deposit money banks/GDP ratio had a significant relationship with financial deepening and concluded that the financial system has not sustained an effective financial intermediation, especially credit allocation and a high level of monetization of the economy.

Agu and Chukwu (2008) employ the augmented granger causality test approach developed by Toda and Yamamoto (1995) to ascertain the direction of causality between "bank-based" financial deepening variables and economic growth in Nigeria between 1970 and 2005. Their co-integration results suggest that financial deepening and economic growth are positively co-integrated. In the Toda-Yamamoto sense, the study finds that the Nigerian evidence supports the demand-following hypothesis for "bank-based" financial deepening variables like private sector credit and broad money; while it supports the supply-leading hypothesisfor "bank-based" financial deepening variables like loan deposit ratio and bank deposit liabilities. Thus, the study concludes that the choice of bank-based financial deepening variable influences the causality outcome.

Shittu (2012) examines the impact of financial intermediation on economic growth in Nigeria with time series data from 1970 to 2010. Employing cointegration test and error correction model, he finds that financial intermediation has a significant impact on economic growth in Nigeria. Azege (2004) examines the empirical nexus between the level of development by financial intermediaries and growth. The study employed data on aggregate deposit money bank credit over time and gross domestic product to establish that a moderate positive relationship exist between financial deepening and economic growth. He concludes that the development of financial intermediary institutions in Nigeria is fundamental for overall economic growth.

Olofin and Afangideh (2010) examine the financial structure and economic growth in Nigeria by using annual data from 1970 to 2005. Small macro econometric model to capture the interrelationships among aggregate bank credit activities, investment behaviour and economic growth given the financial structure of the economy was developed. They adopted three stage least square estimation techniques, while counter factual policy stimulations were conducted. The results of these tests indicate that a developed financial system alleviates growth financing constraints by increasing bank credit and investment activities with resultant rise in output. One major outcome of this study is that financial structure has no independent effect on output growth through bank credit and investment activities, but financial sector development merely allows these activities to positively respond to growth in output.

Odeniran and Udeaja (2010) examine the relationship between financial sector development and economic growth in Nigeria. The study employs granger causality tests in a VAR framework over the period 1960-2009. Four variables, namely; ratios of broad money stock to GDP, growth in net domestic credit to GDP, growth in private sector credit to GDP and growth in banks deposit liability to GDP were used to proxy financial sector development.

The empirical results suggest bidirectional causality between some of the proxies of financial development and economic growth variable. Specifically, the study finds that the various measures of financial development granger cause output even at one per cent level of significance with the exception of ratio of broad money to GDP. Additionally, net domestic credit was equally found to be driven by growth in output, thus indicating bidirectional causality.

The variance decomposition shows that the share of deposit liability in the total variations of net domestic credit is negligible, indicating that shock to deposit does not significantly affect net domestic credit.

Okoli (2010) examines the relationship between financial deepening and stock market returns and volatility in the Nigerian stock market for the period 1980-2009. The study employs the popular GARCH (1, 1) model. Four modeled equations were estimated and analyzed. Financial deepening was represented by two variables, the ratio of the value of stock traded to GDP (FD1t) and the ratio of market capitalization to GDP (FD2t). Empirical results revealed that financial deepening (FD1t) measured as the ratio of value of stock traded to GDP do not affect the stock market and there is no news about volatility. But financial deepening (FD2t) measured as the ratio of market capitalization to GDP affect the stock market. It indicated that financial deepening reduces the level of risk (volatility) in the stock market. Result also recorded that the conditional volatility of returns is slightly persistent.Sulaiman, et al., (2012) critically explore the effect of financial liberalization on the economic growth in developing nations with its assessment focusing on Nigeria with annual time series data from 1987-2009. The study employs co-integration and error correction model (ECM) by making Gross Domestic Product as a function of lending rate, exchange rate, inflation rate, financial deepening (M2/GDP) and degree of openness as its financial liberalization indices. Co-integration result confirms the existence of long run equilibrium relationship while the ECM results show a very high R^2 in both the over-parameterized model (95%) and parsimonious model (91%). The study therefore concludes that financial liberalization has a growth-stimulating effect on Nigeria.

3.0 Methodology

3.1 Theoretical Framework

The fundamental theories of growth are quite explicit on the roles of capital, labour, and technological progress. However, the endogenous growth models were more explicit on the relationship between finance and growth. Carlin and Soskice (2006) gave a brief explanation of these models as follows:

$X = \gamma * \delta * q$……. (1)

Where technological progress (X*)* is defined as a function of research and development (q), while the two parameters define the probability that each unit spent on R&D yields a successful innovation (γ) and the extent to which each innovation raises the productivity parameter (δ), respectively. The economic determinants of the R&D are assumed to be taken as exogenous by the entrepreneur. Thus, these may include; the discounted value of expected returns, the real interest rate, capital per efficiency unit, and institution features of the economy.

$q = q\ \{\gamma, \delta, r, comp, ppr, \varepsilon\}$…….. (2)

From the equation above; the R&D intensity (q) is assumed to be positively related to the discounted value of expected return as measured by γ and δ, negatively related to real interest rate (r), and positively related to capital per efficiency unit (k), while product market competition (*comp.*) and property right (*ppr*) are examples of institutional features within the economy.

Ɛ depicts all other institutional features of the economy not cited in the equation. From equation 1 and 2, the "endogenous relationship" can be derived as:

X = x{k}…….. (3)

This states that since the rate of technology (*x*) depends on *q*, which in turn, depends on *k*, *x* is a function of *k*, the capital efficiency per unit. A positive relationship also exists between the two variables. Thus, an increase in the saving rate in the economy will increase the capital efficiency per unit, which in turn stimulates more R&D activities via innovation. This will bring about growth in the economy. Thus, in a steady state, *x* is similar to economic growth.

3.2 Model specification

The model discussedabove and which form the basis for the present study is adapted from a well-known equation system, tractable and relevant; it benefits greatly from the works of Ndebbio (2004), Nzotta and Okereke (2009),Shittu (2012).

Following a detailed review of previous studies and improving upon the theoretical postulate described in equation three above, economic growth is expressed as a function of financial intermediation, Ft, and a set of control variable, Z. This is expressed by equation (4) below;

Yt = f {Ft, Xt}……..(4)

Following the empirical specifications in Odiabho (2004) and Odeniran and Udeaja (2010), the equation above will be expanded to accommodate the indicators of financial intermediation, as well as the determinants of traditional growth, such as capital stock and trade ratio.

Thus, $Y_t = \alpha + \beta F_t + \delta Z_t + \varepsilon_t$…… (5)

From above, Y_t is the growth rate of real gross domestic product, F_t is the financial deepening indicators, while Z_t is the set of other growth determinants. The parameters include; α, β, and δ. ε_t is the residual term. Thus, the general VAR model for the current study is specified below:

$$GDP = f\left(\frac{M2}{GDP}, \frac{PSC}{GDP}, \frac{GNS}{GDP}, GCF, INTR, INFR, EXCR, PLR, OPEN \ldots\ldots\ldots (6)\right)$$

Where:

Endogenous Variables

GDP = Real Gross Domestic Product
M2/GDP = Ratio of money supply to GDP
PSC/GDP = Ratio of private sector credit to GDP
GNS/GDP = Ratio of gross national savings to GDP
GCF = Gross capital formation
INTR = Interest rate
INFR = inflation rate
EXCR = Exchange rate

Exogenous (Policy) Variables

PLR = Prime lending rate
OPEN = Trade openness
The specific VAR Model

$$(GDP)t = \alpha 1 + \sum_{i=1}^{k} \beta 1i\,(GDP)t - i + \sum_{i=1}^{k} C1i\left(\frac{M2}{GDP}\right)t - i + \sum_{i=1}^{k} D1i\left(\frac{PSC}{GDP}\right)t - i + \sum_{i=1}^{k} E1i\left(\frac{GNS}{GDP}\right)t - 1 + \sum_{i=1}^{k} F1i\,(GCF)t - i + \sum_{i=1}^{k} G1i\,(INTR)t - i + \sum_{i=1}^{k} H1i\,(INFR)t - i + \sum_{i=1}^{k} I1i\,(EXCR)t - i + \sum_{i=1}^{k} J1i\,(PLR)t - i + + \sum_{i=1}^{k} K1i\,(OPEN)t - i + \mu 1t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(7)$$

3.3 Unit Root Test

In order to obtain credible and robust results for any conventional regression analysis, the data to be analyzed must be stationary. This is because estimating regressions using non-stationary variables based on ordinary least square lead to spurious and inconsistent results. Similarly, it is also difficult to conduct hypothesis testing in non-stationary variables as the classical assumptions on the property of the disturbance term is violated (Rao, 1994), stationarity is therefore achieved by applying appropriate differencing called 'order of integration'. The augmented Dickey and Fuller tests are thus

$$\Delta Y_t = \alpha + \beta_t + \delta Y_{t-1} + \sum_{i=1}^{m} di\ \Delta Y_{t-1} + U_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(8)$$

Where ΔY_{t-1} equals $Y_{t-1} - Y_{t-2}$, ΔY_{t-2} equals $Y_{t-2} - Y_{t-3}$ and so on, and m is the maximum lag length on the dependent variable to ensure that U_t is the stationary random error.

3.4 Cointegration Test

This study employs VAR based approach of Johasen (1988) and Johasen and Juselius (1990) test which proposes the use of two likelihood ratio tests.

The Trace test: The trace statistic for the null hypothesis of cointegrating relations is computed as follows:

$$\Gamma_{trace}(r) = -\tau \sum_{i=1}^{m} \log [1 - \lambda_t] \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(9)$$

Maximum eignvalue static tests the null hypothesis of r cointegrating relation against r + 1 cointegrating relations and is computed as follows:

$$\Gamma_{max}(r, r+1) = -\tau \log (1 - \lambda_{r+1}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(10)$$

4.0 Analysis of Results

Table 1: Stationarity Results

Augmented Dickey-Fuller(Trend & Intercept)				Phillips-Perron (Trend & Intercept)		
Variable	Level	1st Diff	2nd Diff	Level	1st Diff	2nd Diff
LGDP	-1.1635	-2.3383	-3.3076	-1.2271	-3.4348	-6.7227
LM2/GDP	-2.0818	-3.6180	-5.1476	-2.4046	-4.9230	-8.2652
LPSC/GDP	-2.2408	-4.5124	-5.3813	-1.9759	-4.5418	-7.1721
LGNS/GDP	-1.9885	-3.8340	-5.1176	-1.7399	-4.0659	-6.9249
LGCF	-3.3602	-5.3189	-6.8487	-4.4328	-7.4617	-10.5929
LEXCR	-1.6556	-3.6629	-4.9728	-2.1169	-4.9741	-8.5081
LPLR	-3.5731	-4.4835	-8.2597	-5.5752	-8.7114	-19.8675
Critical Value						
1%	-4.3942	-4.4147	-4.4415	-4.3738	-4.3942	-4.4167
5%	-3.6118	-3.6219	-3.6330	-3.6027	-3.6118	-3.6219
10%	-3.2418	-3.2474	-3.2535	-3.2367	-3.2418	-3.2474

Source: Extracted from Eview 4.0

The ADF results of the stationarity test show that the series are none stationary at conventional level while the Phillips-Perron (PP) test revealed stationarity at level for gross capital formation and prime lending rate. However, at first and second differencing, all the variables became highly stationary at either 5 or 1 percent confidence level for both the ADF and the PP tests.

Table 4.2: Results of Cointegration

Null Hypothesis	Alternative Hypothesis	Statistical Value	5% Critical Value	1% Critical Value	Eigen Value
Trace Statistics					
$r = 0$	$r \geq 0$	201.8	124.2	133.6	0.9662
$r \leq 1$	$r \geq 1$	120.5	94.2	103.2	0.8493
Max-Eigen Value Statistics					
$r = 0$	$r = 1$	81.3	45.3	51.6	0.9662
$r \leq 1$	$r = 2$	45.4	39.4	45.1	0.8493

Source: Extracted from Eview 4.0

Ten variables were intended for the study and they included gross domestic product (GDP), a proxy for economic growth, M2 as a ratio of GDP (M2/GDP), private sector credit as a ratio of GDP (PSC/GDP), gross national saving as a ratio of GDP (GNS/GDP), gross capital formation (GCF), inflation rate (INFLR), interest rate (INTR), exchange rate (EXCR), prime lending rate (PLR) and openness of the economy. Three of these variables namely: inflation rate, interest rate and openness of the economy were however dropped due to estimation problem of near singular matrix.The co-integration results revealed that long run relationship exists between economic growth and the financial deepening variables. This means that the variables are co-integrated since at least two co-integrating series were found in both the trace and the max-eigenvalues at either 5or 1 percent confidence levels. In interpretation of the results, the series were classified into endogenous and exogenous variables.

Thus all the variables appearing on the columns of table 3 are the current values of the endogenous variables while the rows contain lagged values of the endogenous variables and the exogenous variables in their current state. Each of the endogenous variables was made a dependent variable, thus seven VAR estimates were conducted but the results are the same since all equations have identical regressors. Since all the information in VAR are utilized this makes the interpretation cumbersome. For ease of understanding however, our interest is narrowed to the coefficients with asterisk (*) which is being regarded as significantly responsive while the rest coefficients are either negatively responsive or no relationship at all.

Table 3: VAR Parameter Estimates
t-statistic in ()

	LGDP	LM2/GDP	LPSC/GDP	LGNS/GDP	LGCF	LEXCR	LPLR
LGDP(-1)	1.05*	0.79	0.47	0.63	-40.38*	-0.49	0.36
	(4.6)	(0.7)	(0.3)	(0.4)	(-3.1)	(-0.3)	(0.3)
LGDP(-2)	-0.21	-0.93	-0.16	-0.24	41.23*	0.77	-0.58
	(-1.0)	(-0.9)	(-0.1)	(-0.2)	(3.6)	(0.3)	(-0.6)
LM2/GDP(-1)	0.03	-0.78	-0.81	-1.39*	2.35	1.62	0.77
	(0.2)	(-1.2)	(-0.9)	(-1.8)	(0.3)	(1.1)	(1.3)
LM2/GDP(-2)	-0.13	-0.70	-1.03	-0.79	-5.26	-1.28	-0.53
	(-1.1)	(-1.1)	(-1.2)	(-1.0)	(-0.8)	(-0.9)	(-0.9)
LPSC/GDP(-1)	0.10	0.44	0.96*	0.95*	6.04	0.04	0.07
	(1.1)	(0.9)	(1.5)	(1.6)	(1.1)	(0.0)	(0.2)
LPSC/GDP(-2)	-0.07	-0.64*	-0.90*	-1.18*	-4.39	0.68	0.02
	(-0.9)	(-1.5)	(-1.6)	(-2.3)	(-1.0)	(0.7)	(0.1)
LGNS/GDP(-1)	-0.10	0.66	0.07	0.79	-6.21	-0.88	-0.33
	(-1.2)	(1.4)	(0.1)	(1.4)	(-1.2)	(-0.8)	(-0.8)
LGNS/GDP(-2)	0.22*	0.94*	1.53*	1.39*	6.74	-0.15	0.29
	(2.1)	(1.7)	(2.1)	(2.1)	(1.1)	(-0.1)	(0.6)
LGCF(-1)	-0.01*	0.02	0.04	-0.00	0.11	0.01	-0.04*
	(-1.9)	(0.8)	(1.3)	(-0.2)	(0.5)	(0.3)	(1.8)
LGCF(-2)	-0.01*	-0.03	-0.04	-0.04	-0.51*	-0.02	0.01
	(-1.5)	(-1.1)	(-1.0)	(-1.2)	(-1.8)	(-0.3)	(0.2)
LEXCR(-1)	0.05*	0.13	0.09	0.17	-2.68*	0.70*	-0.02
	(1.8)	(1.0)	(0.5)	(1.0)	(-1.8)	(2.3)	(-0.2)
LEXCR(-2)	0.01	0.04	0.04	-0.13	2.21	0.05	-0.02
	(0.2)	(0.2)	(0.2)	(-0.7)	(1.3)	(0.2)	(-0.1)
CONSTANT	2.32*	5.76	0.53	-0.13	-6.53	-3.01	4.67
	(2.8)	(1.4)	(0.1)	(-0.0)	(-0.1)	(-0.3)	(1.2)
LPLR(-1)	-0.04	0.01	0.04	0.20	5.59*	0.45	0.11
	(-0.7)	(0.0)	(0.1)	(0.5)	(1.5)	(0.6)	(0.4)
LPLR(-2)	-0.05	-0.05	-0.25	-0.15	0.60	-0.46	0.12
	(-1.2)	(-0.2)	(-0.8)	(-0.6)	(0.2)	(-0.9)	(0.6)
R^2	0.99	0.87	0.87	0.91	0.75	0.96	0.76
F-Stat	312.2	4.3	4.6	6.5	1.9	17.3	2.0
AIC	-3.9	-0.6	-0.0	-0.2	4.2	2.8	24.7
SC	-3.2	0.1	0.7	0.5	4.9	1.0	-0.8

Source: Extracted from Eview 4.0

The results therefore show that all the seven equations have good fit with R^2 of between 0.75 and 0.99. Thus, the fit to all the equations is very good while the F-statistic is also very robust with exception of gross capital formation with a value of 1.9. Looking at the overall level of significant of the variables, only about a quarter of the lagged variables in the model were significant. These notwithstanding the results revealed that current gross domestic product, a proxy for economic growth, is significantly and positively responsive to its own one year lag, GNS/GDP (lag 2), exchange rate (lag 1) and negatively responsive to gross capital formation (lag 1). With the lagged values acting as the independent variables, a unit increase for example in GDP (lag 1) increases the current GDP by 1.06 percent. Similarly, a one percent increase in GNS/GDP (lag 2) increases current GDP by 0.22 percent. On the other hand, a unit increase in GCF (lag 1 and 2) decreases current GDP by 0.01 percent. These notwithstanding, the level of significant of GCF (lag 2) is relatively weak, the t-statistic being 1.5.

On the relationship between broad money supply as a ratio of GDP (M2/GDP), it was discovered that private sector credit as a ratio of GDP (PSC/GDP) (lag 2) and gross national saving as ratio of GDP (GNS/GDP) (lag 2) happened to be the determining influence. However, while the impact of PSC/GDP (lag 2) is negative on M2/GDP the relationship between GNS/GDP (lag 2) and M2/GDP is positive.

Table 3 also revealed that PSC/GDP is weakly but positively responsive to its past value (lag 1), negatively responsive to PSC/GDP (lag 2) and GNS/GDP (lag 2). The level of response of PSC/GDP to the lag 2 value of GNS/GDP is however very strong as its t-statistic of 2.1 is statistically significant. Consequently, a hundred percent increase in GNS/GDP (lag 2) will result in about 153 percent increase in PSC/GDP during the period under review.

As for the current level of GNS/GDP, it is observed that M2/GDP (lag 1) and PSC/GDP (lag 2) exhibit significantly negative determining influence while PSC/GDP (lag 1) and the past value GNS/GDP (lag 2) were also seen as its key determinant. On gross capital formation, GDP (lag 2) and prime lending rate (lag 1) had significant positive impact while GDP (lag 1), GCF (lag 2) and EXCR (lag 1) turned out to be negatively determining influences. Similarly, the current value of exchange rate is significant and positively responsive to its one year lagged value, while on prime lending rate, it is responsive to one year lagged value of gross capital formation with a negative relationship. For example, a one percent increase in GCF (lag 1) has the tendency to decrease prime lending rate by approximate 4 percent.

A cursory look at the results shows that only current GDP is significantly responsive to the constant factor which reflects the level of economic growth at the beginning of 1986. It must be stressed here that the interest in the study is to establish the extent of financial deepening on economic growth in Nigeria for the period 1986-2011. However, it was discovered that of the three measures of financial deepening employed in this study, only gross national saving as a ratio of GDP (lag 2) has positive significant impact on current GDP. Such impact is inadequate in light of other indicators of financial deepening such as M2/GDP and PSC/GDP that could not engender any positive significant influence on the economy.Nzotta and Okereke (2009), Obamuyi (2010), Odeniran and Udeaja (2010) among other authors have earlier reach similar findings.

4.2 Results of Variance Decomposition

Table 4 below presents the variance decomposition estimates for various indicators of financial deepening and economic growth in Nigerian with a 10-year forecast horizon in which the contribution of each variable own shocks and to the shocks of other variables in the system were explained.

Panel one of the table shows the variance decomposition for gross domestic product while panel two is for M2/GDP and so on for the ten-year period. The third column of panel one shows the percentage of gross domestic product forecast error that can be attributed to its own shocks as opposed to other components of the economy while column 4-9 shows the percentage of gross domestic product that can be attributed to shocks in M2 as a ratio of GDP (M2/GDP), private sector credit as a ratio of GDP (PSC/GDP), gross national saving as a ratio of GDP (GNS/GDP), gross capital formation (GCF), exchange rate (EXCR) and prime lending rate (PLR).

In interpreting the results however, only the tenth year period is considered while other periods were also interpreted along the same line of reasoning. Similarly, panels 1 for gross domestic product, a proxy for economic growth, 2, 3 and 4 made up of three indicators of financial deepening, which are the variables of interest for the study were the only ones interpreted.

Thus, in panel 1, in the ten-year period therefore, gross domestic product explains about 9 percent shock of its forecast variance. The percentage of the forecast variance in gross domestic product that can be attributed to shocks in M2/GDP is 31 percent, 0 percent for PSC/GDP, 6 percent for GNS/GDP, 11 percent for GCF, about 39 percent for exchange rate and 3 percent for prime lending rate. Thus, among the major shocks to the banking sector are mainly from M2/GDP and exchange rate.

In panel two of the table, gross domestic product contributes about 19 percent of the shock in broad money supply as a ratio of GDP while about 30 percent of the forecast variance could be traceable to M2/GDP itself. The percentage of the forecast variance of the other variables to M2/GDP is about 6 percent for PSC/GDP, approximately 18 percent for GNS/GDP, 20 percent for gross capital formation, 5 percent for exchange rate and about 2 percent for prime lending rate.

Table 4: Variance Decomposition

Variance Decomposition of LOG(GDP)								
Period	S.E	LGDP	LM2/GDP	LPSC/GDP	LGNS/GDP	LGCF	LEXCR	LPLR
2	0.04	74.31	8.03	1.50	1.29	10.22	4.40	0.26
4	0.08	22.93	30.16	0.65	4.45	16.75	23.25	1.81
6	0.12	13.31	34.12	0.52	3.15	13.96	32.59	2.37
8	0.13	10.77	31.89	0.50	2.99	13.16	37.66	3.03
10	0.14	9.28	31.19	0.43	5.58	11.37	38.68	3.30
Variance Decomposition of LOG(M2/GDP)								
Period	S.E	LGDP	LM2/GDP	LPSC/GDP	LGNS/GDP	LGCF	LEXCR	LPLR
2	0.20	11.26	70.13	6.49	6.11	3.51	2.49	0.00
4	0.26	11.11	40.13	4.89	23.02	15.08	4.49	0.32
6	0.30	18.78	31.56	4.74	20.58	19.26	4.27	0.82
8	0.31	19.19	29.51	5.73	18.91	20.24	4.78	1.63
10	0.31	19.04	30.31	5.57	18.40	19.63	5.41	1.64
Variance Decomposition of LOG(PSC/GDP)								
Period	S.E	LGDP	LM2/GDP	LPSC/GDP	LGNS(GDP)	LGCF	LEXCR	LPLR
2	0.25	4.15	52.72	34.01	0.04	8.37	0.70	0.01
4	0.30	4.73	38.55	23.75	18.41	13.98	0.53	0.05
6	0.35	18.25	29.47	18.41	15.25	16.99	1.22	0.42
8	0.37	18.11	27.85	17.66	14.01	18.81	2.43	1.13
10	037	17.14	29.09	16.56	13.36	18.26	4.33	1.27
Variance Decomposition of LOG(GNS/GDP)								
Period	S.E	LGDP	LM2/GDP	LPSC/GDP	LGNS/GDP	LGCF	LEXCR	LPLR
2	0.25	11.69	52.02	15.77	16.30	0.83	3.19	0.18
4	0.35	8.43	31.38	8.55	29.04	20.13	1.92	0.54
6	0.41	18.02	22.92	7.32	22.90	25.83	1.90	1.11
8	0.43	18.01	21.57	8.47	20.83	26.65	2.56	1.91
10	0.44	17.42	22.45	8.12	20.14	26.19	3.68	1.99
Variance Decomposition of LOG(GCF)								
Period	S.E	LGDP	LM2/GDP	LPSC/GDP	LGNS/GDP	LGCF	LEXCR	LPLR
2	2.09	11.14	0.13	4.32	8.60	69.68	3.84	2.02
4	2.49	11.44	12.72	4.70	13.03	49.89	6.17	1.99
6	2.67	15.73	11.20	5.08	13.74	45.05	7.12	2.08
8	2.80	16.07	11.79	5.39	14.93	42.23	7.69	1.90
10	2.85	15.83	11.52	5.67	15.62	41.94	7.46	1.95
Variance Decomposition of LOG(EXCR)								
Period	S.E	LGDP	LM2/GDP	LPSC/GDP	LGNS/GDP	LGCF	LEXCR	LPLR
2	0.51	29.94	20.21	18.82	1.28	5.83	31.70	0.22
4	0.57	21.20	20.87	14.93	1.72	6.33	34.72	0.20
6	0.60	20.83	19.00	14.51	4.49	7.20	33.76	0.21
8	0.65	18.90	16.75	12.94	10.10	11.13	29.98	0.20
10	0.69	18.75	15.70	12.23	10.66	14.26	28.08	0.33
Variance Decomposition of LOG(PLR)								
Period	S.E	LGDP	LM2/GDP	LPSC/GDP	LGNS/GDP	LGCF	LEXCR	LPLR
2	0.17	0.77	18.30	22.53	0.88	42.72	4.42	10.38
4	0.20	12.03	16.52	17.04	7.89	30.20	8.78	7.54
6	0.21	11.41	16.06	16.94	10.28	30.15	8.03	7.12
8	0.22	12.88	16.83	15.22	10.87	27.50	10.13	6.56
10	0.22	12.83	16.69	15.33	11.15	27.37	10.11	6.51

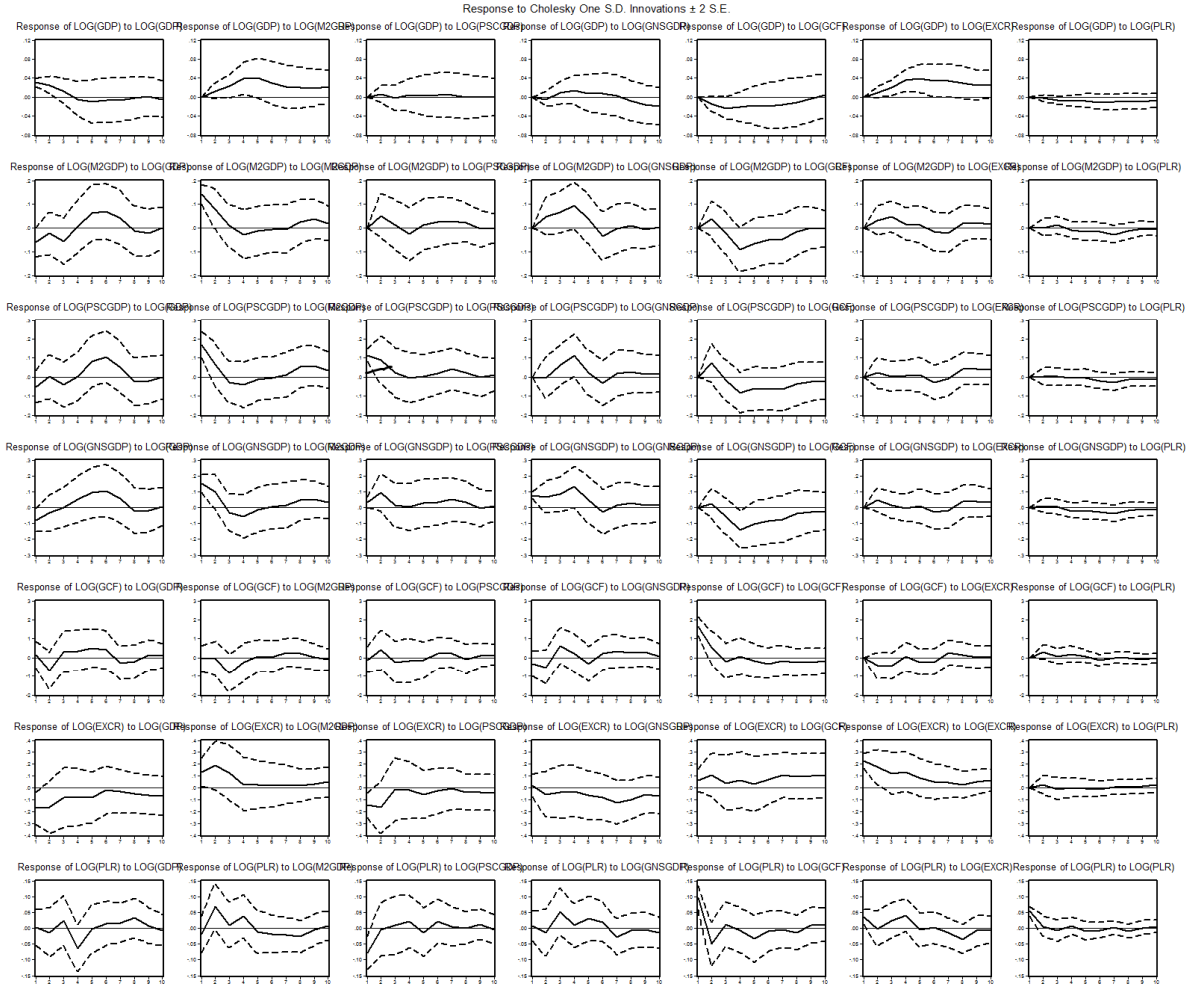
Source: Extracted from Eview 4.0

Similarly, in panel three of the table, private sector credit as a ratio of GDP explains about 17 percent of its own shock while another 17 percent could be traceable to gross domestic product, 29 percent to broad money supply as a ratio of GDP, 13 percent to gross national saving as a ratio of GDP, 18 percent to gross capital formation, 4 percent to exchange rate, and a meager 1 percent to prime lending rate in the ten-year horizon.

The VDC for gross national saving as a ratio of GDP shows that its own contribution of shocks to itself is 20 percent while the contributions attributable to GDP is 17 percent, broad money supply as a ratio of GDPis 22 percent, private sector credit as a ratio of GDP is 8 percent, gross capital formation is 26 percent,4 percent for exchange rate and 2 percent for prime lending rate.

The remaining three panels of the table can be interpreted likewise. The VDC shows that M2/GDPand PSC/GDP explain most of the shocksamong the financial deepening variables. Inspection of the rest panels in the tenth year period shows similar results.

Fig1: Impulse Response Function



Impulse response function determines how each endogenous variable responds to a shock in that variable and in every other endogenous variable.

Like the VDC, it is observed that most of the innovations are due to the variables' own shock. However, the response of gross domestic product to shocks occasioned by the three measures of financial deepening employed in this study were only interpreted while the other variables can be similarly interpreted along the same line of reasoning.

The innovation in GDP occasioned by its own shock was initially positive up to about the 4th period. It became negative from the 4th period to about the 8th period, reaching zero in the 9th period and gradually declined beyond the 10th period. As for the response of GDP to a shock in M2/GDP, it is observed that the response therein was positive from the 1st period, reaching its peak in the 5th period and declined gradually but still positive beyond the 10th period.

In the case of private sector credit as a ratio of GDP, the shocks therefrom causes GDP to respond slightly positive in the 2nd period and declined to zero in the 3rd period, positive again from the 4th to 7th period and dies out from the 8th period. Finally, the innovation in GDP to shocks occasioned by GNS/GDP was negative in the 1st period, positive from about the 3rd period to the 8th period and became negative thereafter and continued beyond the 10th period.

5.0 Concluding Remarks

Motivated by unending search in financial literature on the relationship between financial deepening and economic growth, this study aimed at contributing to the growing literature by applying the study on Nigeria. The study observes that during the period under review, economic performance was found strange as the period recorded high average annual growth rate in financial deepening variables, yet the same period recorded the worst average real annual growth rate in economic growth except 1990, 2002-04 and 2011 with double digit growth rates (table not displace for lack of space).

This study which is titled *Financial Deepening and Economic Growth in Nigeria, 1986-2011: An Empirical Investigation* assessed the level of development of financial deepening in the banking sector and the extent it has impacted on economic growth over the last two decades. The study is both theoretical and empirical in whichVAR methodology and its derivatives, impulse response function and variance decompositionwere employed that enable us to scrutinize the relationship between financial deepening and economic growth and financial deepening variables themselves. To investigate the stochastic properties of the series, stationarity test was applied, which was closely followed by co-integration test that assessed the long run relationship of the variables.

Seven variables employed for the study included real gross domestic product (GDP), broad money supply as a ratio of GDP (M2/GDP), private sector credit as a ratio of GDP (PSC/GDP), gross national saving as a ratio of GDP (GNS/GDP), gross capital formation (GCF), exchange rate (EXCR) and prime lending rate (PLR). The stationarity test result shows that the logarithmic value of the series were not stationary at level but became stationary after first and second differencing. Similarly, co-integration test showed that the variables are co-integrated and which further confirmed that long run relationship existed between the variables.

The results of the VAR estimates revealed that a one year lag of economic growth, gross national saving as a ratio of GDP (lag 1) and exchange rate (lag 1) have significant positive impact on current economic growth while the impact of GCF (lag 1) on the current level of economic growth was negative and statistically significant. It was also discovered that PSC/GDP (lag 2) and GNS/GDP (lag 2) happened to be key determinants of M2/GDP.

Similarly, the key determinants of PSC/GDP include its year 1 and 2 lagged values and GNS/GDP (lag 2)with GNS/GDP (lag 2) and PSC/GDP (lag 2) exhibiting negative impact. Finally, on the current level of GNS/GDP, it is observed that M2/GDP (lag 1) and PSC/GDP (lag 2) exhibit significantly negative determining influence while PSC/GDP (lag 1) and the past value GNS/GDP (lag 2) were also seen as its key determinant. These findings are further corroborated by the results of the impulse response function and variance decomposition which revealed that most of the shocks in GDP were occasioned by innovation in M2/GDP and PSC/GDP.

From the analysis done in this study, we can conclude that the level of financial deepening in Nigerian has remained relatively low in spite of the various reforms and institutional changes put in place by the monetary authorities. It is also evident from the findings that the low level of monetization of the economy, the high rate of inflation and the level of private sector credits have negatively affected the level of financial deepening in Nigerian. Although the level of interest rates have remained very high, the level of private sector credits have not sustained the desired level of new investments necessary to facilitate growth in the economy.

It is therefore recommended in this paper that although gross national saving as a ratio of GDP significantly impact on economic growth in Nigeria, much still needs to be done. The policy towards interest rate should be made such that savings would be stimulated thereby placing more funds in the hands of banks to intermediate to investors seeking funds. Also, lending rate should be reasonable so as not to deter investors desire to borrow to embark on viable investment projects.

Secondly, there is an urgent need to sustain a higher level of macro-economic stability in Nigeria, reduce the high incidence of non performing credits to ensure that private sector credits are channeled to the real sector of the economy, enhance the level of corporate governance in the financial system and also strengthen risk management in the financial system.

Thirdly, astronomical high lending rates coupled with depreciating naira exchange rate have negative repercussions on the economy by discouraging long-term investment especially in new projects and those risky but productive and desirable ventures, and fuelling inflation as a result of low capacity utilization by firms. As such the monetary authority (CBN) should implement policies that increase the flow of investible funds and improves the capacity of banks to extend credit to the economy. This will make broad money supply and private sector, both as ratio of GDP to significantly impact on economic growth in Nigeria.

Finally, to fully realize the growth potentials of the Nigerian economy, it is necessary to remove all obstacles that could undermine the growth of credit to the domestic economy. Among other measures, the establishment of the proposed Asset Management Corporation Nigeria should be hastened to free the deposit money banks from non-performing loans, and thereby, enhance their ability to extend credit to the economy.

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