Bank Savings and Bank Credits in Nigeria:
Determinants and Impact on Economic Growth

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ABSTRACT: This study investigated the determinants of bank savings in Nigeria as well as examined the impact of bank savings and bank credits on Nigeria's economic growth from 1970-2006. We adopted two impact models; Distributed Lag-Error Correction Model (DL-ECM) and Distributed Model. The empirical results showed a positive influence of values of GDP per capita (PCY), Financial Deepening (FSD), Interest Rate Spread (IRS) and negative influence of Real Interest Rate (RIR) and Inflation Rate (INFR) on the size of private domestic savings. Also a positive relationship exists between the lagged values of total private savings, private sector credit, public sector credit, interest rate spread, exchange rates and economic growth. We therefore recommend, among others, that government's effort should be geared towards improving per capita income by reducing the unemployment rate in the country in a bid to accelerate growth through enhanced savings.

Keywords: Bank; Saving; Credit; Financial Sector; Economic Growth
JEL Classifications: E51; G21; G24; O16; O4

1. Introduction

Recent macroeconomic developments in Nigeria's financial sector reveal a strong desire by the monetary authorities to reposition Nigeria's financial system to meet the trend of globalization. However, banks' participation in the financial sector of developing nations like Nigeria raises many questions which remain unanswered. Key among them is the issue of how effective they have been in mobilizing private domestic savings and in channeling the savings to enhance growth through the distribution of credits. As capital formation is an important factor in economic growth, countries that are able to accumulate high level of capital tend to achieve faster rates of economic growth and development. The effects of investment on economic growth are three-fold. Firstly, demand for investment goods forms part of aggregate demand in the economy. Thus a rise in investment demand will, to the extent that the demand is not satisfied by imports, stimulate production of investment goods which in turn leads to high economic growth and development. Secondly, capital formation improves the productive capacity of the economy. Thirdly, investment in new plant and machinery raises productivity growth by introducing new technology and innovation which would also lead to faster economic growth.

To finance investment required for economic growth, the economy needs to generate sufficient savings or borrow from abroad. However, borrowing from abroad may not only have adverse effects on the balance of payment as these loans will have to be serviced in the future but it also carries a foreign exchange risk. Therefore, domestic savings are necessary for economic growth because they provide the domestic resource needed to fund the investment effort of a country. Banks are statutorily vested with the primary responsibility of financial intermediation in order to make funds available to all economic agents. The intermediation process involves moving funds from surplus economic units of the economy to deficit economic units (Uremadu, 2002; Nnanna et al., 2004).

Financial intermediation is an important activity in the economy because it allows funds to be channeled from people who might otherwise not put to productive use to people who will. In this way financial intermediation helps to promote a more efficient and dynamic economy. According to Gershenknon (1962), banks more effectively finance industrial expansion than any other form of

financing in developing economies. In Nigeria, banks are the largest financial intermediaries in the economy. Financial intermediaries help to bridge the gap between borrowers and lenders by creating a market with two types of securities, one for the lender and the other for the borrower (Vane and Thompson, 1982). However, the extent to which this could be done depends on the level of development of the financial sector as well as the savings habit of the populace. The availability of investible funds is therefore regarded as a necessary starting point for all investment in the economy which will eventually translate to economic growth and development (Uremadu, 2006).

Conceptually, savings represent that part of income not spent on current consumption. When applied to capital investment, savings increase output (Olusoji, 2003). Institutions in the financial sector like deposit money banks (DMBS) or commercial banks mobilize savings deposits on which they pay certain interest. To effectively mobilize savings in an economy the deposit rate must be relatively high and inflation rate stabilized to ensure a high positive real interest rate, which motivates investors to save from their disposable income. The recent consolidation initiative which has reduced the number of banks from eighty-nine (89) to twenty-four (24) is a step towards this market-based direction. It aims at reducing the cost of capital by allowing domestic economic units to achieve efficient portfolio diversification in order to increase the liquidity of investments; and opening the financial industry to foreign investors. Ultimately, the reform initiative is meant to produce a sound and healthy financial services sector, which is crucial if the country must avail itself of the windows of opportunity opened up by globalization, to develop the economy and further the country's industrialization.

Access to financial services is important for growth and poverty reduction. Access to credit that enables an individual to accumulate funds in a secure place over time can strengthen productive assets by enabling investment in micro- enterprises, in new tools, equipment or fertilizers, or in education or health, all of which can play an important role in improving their productivity and income. However, in many developing countries like Nigeria, commercial bank lending or access to formal financial services for the poor majority of the population remains very limited. Credit is the main channel through which savings are transformed into investments. However, not all savings are used to finance investment despite high demand for credit because the credit market in Nigeria is rationed (Soludo, 1987; Azege, 2007). Indeed, the lack of credit has been cited by firm managers in Africa as their most important constraint (Bigstein and Soderbom, 2005).

Lack of funds has made it difficult for firms to invest in modern machines, information technology and human resources development which are critical in reducing production costs, raising productivity and improving competitiveness. Low investments have been traced largely to banks unwillingness to make credits available to manufacturers, owing partly to the mis-match between the short-term nature of banks' funds and the medium to long term nature of funds needed by industries. In addition, banks perceive manufacturing as a high risk venture in the Nigerian environment, hence they prefer to lend to low-risk ventures, such as commerce, in which the returns are also very high. Even when credit is available, high lending rate ,which was over thirty percent (30%) at a time, made it unattractive; more so when returns on investments in the sub –sector have been below ten percent (10%) on the average (Nwasilike, 2006). In fact, some "watchers" of developments in the industry have accused banks of enjoying abnormal profits by charging high rates on credits whilst paying considerably lower rates on deposits. Bankers on their own part have argued that the perceived high spread is necessitated by the high costs of running banking business arising from regulating costs as well as those induced by the environment where they operate such as costs of power and infrastructural decays, etc (Afolabi et al., 2003).

Following the liberalization of the financial sector in 1986, interest rate became market determined and soon soared above repression regime values. Despite high inflation rates, real interest rate as at 2000 was over 15% (CBN, 2007). The high spread of lending and deposit rates has also constituted a serious disincentive to effective financial intermediation in Nigeria. The performance of saving mobilization in Nigeria has not been encouraging. Instead of increasing to match the development challenges, there is a clear indication of saving decline in Nigeria, inspite of various policy measures. These measures include rural banking program, establishment and expansion of People's Bank of Nigeria, Primary Mortgage Institutions, Insurance Companies and the Social Insurance Trust Fund which was reconstituted from the National Provident Fund. In fact, the National

Bureau of statistics (NBS) estimated Nigeria's Gross National Saving in 1993 to be N63.4 billion rising from N59 billion in 1991, and declined again to N59 billion in 1996.

To curb this decline, the operational environment for banks was further liberalized with the introduction of universal banking in 2001, while the supervisory framework of the financial system was enhanced with the establishment of a new department in the Central Bank to supervise other institutions. According to Nnanna (2002), by the end of 2001 the financial sector in Nigeria consisted of 90 Deposit Money Banks, 747 Community banks, 6 development finance institutions, 1 Stock Exchange, 1 Commodity Exchange, 5 Discount Houses, 74 Primary Mortgage Institutions, 98 Finance Companies, 118 Insurance Companies and 80 Bureau de change. However, only 10 banks control about 53% of the total deposits, 46.5% of the total credits, and 50.8% of the total assets in the industry. In 2002 the monetary policy implementation Committee were faced with some challenges, as the problem of excess liquidity persisted, and the demand perceive in the foreign exchange intensified. This could be attributed to the monetary control frame work, which relied heavily on credit ceilings and selective credit control which increasingly failed to achieve the set monetary targets as their implementation became less effective with time.

However, following NEEDS (2004), the desired private credit sector for investment purposes has to be of medium and long-term nature, with low interest rates, ideally single digit. Incidentally, the total asset base of the entire Nigerian banking industry is estimated at a mere US $24 billion, while the deposit base is a paltry US $15 billion. The quantum of government domestic debt by way of treasury bills and bonds alone (about 73%) relative to domestic deposits constitutes major impediment to private sector investment financing (CBN, 2007). Meanwhile the financial strength of other financial service providers in the system is equally small as shown below:

❖ Capital market: 265 listed stock, and market capitalization of US $17 billion as at June 2004.
❖ Insurance: Total assets of US $ 7 billion and gross premium of N37 billion.
❖ Primary Mortgage Institutions: Total asset base (US $500m), and capital of US $20 million in 2003.
❖ Development Finance Institution: Permanent Capital of US $48 million.

This huge gap between financing needs and the available financing capacity represents major constraints to growth opportunities in business financing, and accords with one of NEEDS (2004) strategy of stimulating real sector financing by mobilizing cheap long term saving.

Table 1. The ratio of loans to small scale enterprises (SSEs) to commercial banks total credit

YEAR	COMM.BANK LOANS TO SSE (=N='m)	COMM. BANK TOTAL CEDIT (=N='m)	COMM. BANKS LOANS TO SSE AS PER. (%) OF TOTAL CREDIT
1999	46,824.0	353,081.1	13.3
2000	44,542.3	508,302.2	8.7
2001	52,428.4	796,164.8	6.6
2002	82,368.4	954,628.8	8.6
2003	90,176.5	1,210,033.1	7.5
2004	54,981.22	1,519,242.7	3.6
2005	50,672.6	1,899,346.4	2.7
2006	25,713.7	2,524,297.9	1.0

Source: CBN (2007).

It is evident from the table 1 above that commercial bank lending in Nigeria remains very unstable and this has made its contribution to the development of small scale business enterprises very insignificant. It is worthy to note that according to CBN (2007), the commercial banks loans to small scale enterprises as percentage (%) of total credit declined from 48.8% in 1992 to 32.2%, 22.2%, 22.9%, 25.0%, 17.0%, and 15.5% in 1993,1994,1995,1996, 1997 and 1998, respectively. From the table above we can also see a consistent decline from 13.3% in 1999 to 1.0 2006. This could be partially attributed to the abolition of mandatory banks' credit allocation of 20 % of its total credit to small scale enterprises wholly owned by Nigerians which took effect from October 1, 1996.

Despite the fact that Nigeria has implemented some economic policies that are based on financial liberalization as elucidated in the Structural Adjustment Programme (SAP) and other banking reforms, the issue of the persistent low level of economic development in Nigeria still remains a matter of great concern. It has been argued that this is the outcome of capital shortage (Yohannes, 1994). To this end, it becomes imperative to carry out an empirical investigation on the performance of the banking sector as a financial intermediary. The research questions arising from the above issues and the objectives we seek to pursue are therefore as follows:

(a)   What are the determinants of bank savings in Nigeria?
(b)   What is the impact of bank savings and bank credits on Nigeria's economic growth?

2. Literature Review
2.1. Theoretical Literature
The Classical Economists did the first theoretical explanation of the determinants of savings and its importance. Smith (1776) recognized the importance of savings when he observed that, "*Capital is increased by parsimony and diminished by prodigality and misconduct*". Prior to 1936, the classical economists propounded their theory on the savings and asserted that a negative relationship existed between savings and interest rate.

Keynes (1936) defined savings as the excess of income over expenditure on consumption. This means that saving is that part of disposable income of the period which has not passed into consumption (Umoh, 2003; Uremadu, 2006). Given that income is equal to the value of current output; and that current investment (ie Gross Capital Formation) is equal to the value of that part of current output which is not consumed, savings is equal to the excess of income over consumption. Hence, the equality of savings and investment necessarily follow thus:

Income = Value of output = Consumption + Investment…….....….. (1)
Savings = Income- Consumption………………………………….(2)
From (1)
Savings = Investment……………………………………...………… (3)

Keynes maintains that on the aggregate, the excess of income over consumption (otherwise called savings) cannot differ from addition to capital equipment (i.e. *Gross fixed capital formation or gross domestic investment)*.

Savings is therefore a mere residual, and the decision to consume and the decision to invest between them determine the volume of national income accumulated in a period. In the Keynesian view therefore, rising income would result in higher savings rates. As a matter of fact, savings is regarded as being complementary to the consumption function. In its simplest form, the savings function is derived from the linear consumption function when the autonomous consumption expenditure is separated off (Umoh, 2003).

Anyanwu and Oaikhenan (1995) classified the determinants of savings into objective and subjective factors respectively. The objective factors are the quantifiable and verifiable determinants of savings. These include; the level of income, the rate of interest, inflation rate, expectation about inflation rate, and saving facilities. On the other hand, the subjective determinants of savings are the non-quantifiable and non – traceable factors that influence savings behaviours and which are largely psychological in nature. These include; the instinct for precaution, the desire for bequest, habits and cultural factors.

2.2. Empirical Literature on Bank Savings, Bank Credits and Economic Growth
Domestic savings mobilization by commercial banks and credit allocation functions stem from their role as the financial intermediaries in the domestic economy. The link between domestic savings, commercial bank credits and economic growth is not a new discovery. Its debate has a long pedigree and is marked with conflicting conclusions. The difference in conclusion is due not only to differences in theoretical perspectives, but also to the way in which the link between them is taken into account by researchers.

The financial sector limits, prices, pools and trades all the risks involved in a transaction and provide incentives for savers to invest by matching potential earnings with those risks. Empirical research has shown that financial depth is generally associated with an increase in GDP (Levine, 2005).In contrast, distorted financial markets with high macro – economic instability, direct Government involvement and weak regulation can have extremely adverse effects on economic

growth. As a result the focus of many recent works on the financial sector has been on deepening and broadening financial markets in developing countries and on improving financial sector regulation, supervision, and governance. The increasing participation of commercial banks has been one of the most striking structural changes experienced by banking systems in developing countries over the past decade. In Nigeria, the number of banks stands at 24 due to the recent bank consolidation exercise.

Common argument against bank credits is that banks might tend to "cherry pick" the most profitable customers, reducing financing to some sectors, increasing the risk exposure of micro – finance banks, and these affect the overall distribution of credit. In particular, the main area of concern is the availability of credit to private investors and small businesses. In many developing countries, small businesses account for a very significant share of total value added and generate a large traction of the total jobs in the economy.

Banks are perceived as having a comparative advantage over other institutions in small business lending. This role is likely to be more important in less developed countries that are generally more heavily dependent on bank financing. In Argentina, for example, 79 percent of small industrial firms have bank debt (Llorens et al, 1999). Moreover, small businesses tend to have exclusive dealings with a single bank with which they have a strong relationship. Given the paucity of information about small businesses, these relationships enable banks to generate information on the risk characteristics of individual investors or small firms. Therefore access to credit by private investors and small businesses would be reduced if banks were to neglect small business and/or drive domestic micro – finance banks from the market, destroying the information generated through bank – borrower relationships.

For example, Greenwoood and Jovanovic (1990) show that domestic savings and bank credits provides a vehicle for diversifying and sharing risks, inducing capital allocation shift towards risky but "high expected return" projects. This shift then spurs productivity improvement and economic growth. Diamond (1983) argues that household facing liquidity risks prefer liquid but low – yield projects to liquid but high – yield one, while banks pooling liquidity risks, would like to invest a generous portion of their finds into liquid but more profitable projects. Bencivenga and Smith (1998) argue that financial intermediaries, by eliminating liquidity risks, channel house holds' financial savings into illiquid but high – return projects and avoid the premature liquidation of profitable investments, which favours efficient use of capital and promotes economic growth.

Tsuru (2000) argues that financial intermediation could affect the savings rate, and then capital formation and growth, through its impact on four different factors; (i) Idiosyncratic risks; (ii) Rate – of – return risks; (iii) Interest rates and (iv) Liquidity constraints.

A number of recent studies, however, have shown that commercial banks seem to improve banking system efficiency and thereby contribute to overall banking stability in developing countries (Levine and Loayza (1999), Barajas, et al. (2000), Classens, et al. (2000); Clarke et al, (2000), and Dages et al. (2000). On the other hand, the effect of bank credits in developing countries especially in Nigeria remains largely unexplored.

There is however very little literature that deals directly with the implications of bank credit to investors and small businesses in developing countries. Argentina is among the few countries for which we found such studies. Bleger and Rozenwurcel (2000) indicate that bank participation in Argentina is associated with a reduction of bank credits to small businesses from around 20 to 16 percent of total lending between 1996 and 1998. In contrast, Escude, et al (2001) found that despite their lower tendency to lend to small businesses, banks have increased both their propensity and their market share of lending to the sector between 1998 and 2000. Finally, using a rich data set on Argentinean business debtors in December 1998, Berger et al., (2000) found that large banks and foreign-owned banks are less inclined to extend credit to smaller firms, which are likely to be informationally opaque. Given the paucity of research on the impact of private domestic savings and bank credits on economic growth in Nigeria, and owing to the importance of this issue from a policy standpoint, further empirical investigation is clearly warranted.

3. Methodology

This section deals with model specifications, data definitions, data transformations, estimation procedures, evaluation techniques, and sources of data.

Given the nature of the objectives of this study, the ARDL-ECM models will be adopted. To achieve the first objective, we have adopted and modified the model specifications of Uremadu (2007) to come up with our model of bank savings in Nigeria. Here, using the ordinary lest square (OLS) technique, per capita income (PCY) and other variables are regressed on the total private domestic savings / GDP at current market price ratio.

To achieve the second objective, we shall adopt a second model specification. Here, we are interested in studying the impact of private domestic savings and bank credits on Nigeria's economic growth. Thus, we shall modify and extend the model specifications of Azege (2007). Using the OLS techniques, total private savings, private sector bank credits, and other variables are regressed on GDP.

3.1 Specification of Models

3.1.1 Model I

The total private domestic savings / GDP ratio equation to be estimated is specified as follows:

$$TPSY = f (PCY, RIR, FSD, IRS, INFR) \dots \tag{1}$$

where:

TPSY = Total private domestic savings / GDP ratio at current market prices. The ratio will help us ascertain the size of these savings.

PCY = GDP per capita at current naira income of the people. Increase in per capita income of the people will impact positively on their savings ability (Uremadu, 2006).

RIR = Real Interest Rate. This is defined as the nominal interest rate from savings deposits minus annual inflation rate. It impacts positively on total savings.

FSD = Financial Deepening. Its proxy is captured by broad money (M_2) as ratio to GDP. Financial deepening enhances increase in volume of all monies in circulation in the economy. Efficient financial intermediation will increase financial deepening. Effective financial deepening (which is also a proxy for financial sector development) will have a salutary effect on the economy as well as a positive effect on savings mobilization.

IRS = Interest Rate spread. This is defined as interest rate differential between maximum lending rate and savings deposits rate. It has a negative impact on savings. Interest rate determination is a critical factor in the loanable funds market given its role in the mobilization and allocation of financial resources or credit in an economy.

INFR = Inflation Rate. It impacts negatively on domestic savings mobilization. It should be well noted that inflationary expectations play an important role in the supply of and demand for loanable funds.

To make equation (1) amenable for empirical verification, we transform it into an econometric equation;

$$TPSY = \alpha_0 + \alpha_1 PCY + \alpha_2 RIR + \alpha_3 FSD + \alpha_4 IRS + \alpha_5 INFR + \mu \tag{2}$$

where:

α_i = Parameters to be estimated.

μ = Error Term

Assuming that the variables in equation (2) are not well behaved, we rewrite it as:

$$\Delta TPSY_t = \alpha_0 + \alpha_1 (\Delta PCY_{t-i}) + \alpha_2 (\Delta RIR_{t-i}) + \alpha_3 (\Delta FSD_{t-i}) + \alpha_4 (\Delta IRS_{t-i}) + \alpha_5 (\Delta INFR_{t-i}) + \mu_t \tag{3}$$

where:

Δ = Difference Operator

αi = Parameter to be estimated

t-i = Unknown lags to be estimated

μ = Error Term

Equation (3) captures our objective. It assumes that all the variables are well behaved, otherwise equation (3) translates to:

$$\Delta^{ko} TPSY_t = \alpha_o + \alpha_1 (\Delta^{k1} PCY_{t-i}) + \alpha_2 (\Delta^{k2} RIR_{t-i}) + \alpha_3 (\Delta^{k3} FSD_{t-i})$$
$$+ \alpha_4 (\Delta^{k4} IRS_{t-i}) + \alpha_5 (\Delta^{k5} INFR_{t-i}) + \mu_t \tag{4}$$

where: K = Order of Differencing.

Equation (4) assumes that: $K_0 \neq K_1, K_2, K_3, K_4, K_5$. Else if k_o is equal to any of $K_1, K_2...K_5$, then we shall investigate the presence of a co-integration amongst the variables. If the residuals are stationary and a long in relationship is established, then the parameters will thus be suitably estimated by introducing an error correction mechanism as developed by Engle and Granger (1987). This will enable us separate the long run relationship of TPSY from its explanatory variables.

Note that if there is evidence of co-integration, then equation (4) converges to the Error Correction Model (ECM) as shown below:

$$\Delta^{ko}TPSY_t = \alpha_o + \alpha_1(\Delta^{k1}PCY_{t-i}) + \alpha_2(\Delta^{k2}RIR_{t-i}) + \alpha_3(\Delta^{k3}FSD_{t-i})$$
$$+ \alpha_4(\Delta^{k4}IRS_{t-i}) + \alpha_5(\Delta^{k5}INFR_{t-i}) + \alpha_6(ECM_{t-i}) + \mu_t \tag{5}$$

where:

α_6 = *The Speed of Adjustment Parameter*

ECM_{t-i} = *The Residual or Error Correction Mechanism of The Previous Year*.

However, to ensure the parsimonious nature of the model, equation (5) translates to an Auto regressive Distributed Lag (ARDL) model as shown below.

$$\Delta^{ko}TPSY_t = \alpha_o + \theta_i(\Delta^{ko}TPSY_{t-i}) + \alpha_i \sum_{i=1}^{n} \Delta^{ki}Z_{t-q} + \alpha_6(ECM_{t-i}) + \mu \tag{6}$$

where, $Z_t - q$ = vector of macroeconomic controls that includes all other explanatory variables in the model.

ARDL [1, 3] will be used to avoid unnecessary loss of degrees of freedom. Also model simulation will be carried out to avoid specification error and to ensure the marginalization of the entire irrelevant variables in the ARDL model. But if our auto-regressive variable ($\Delta^{ko}TPSY_{t-i}$) becomes marginalized in the process of simulation, then equation (6) translates to only Distributed Lag (DL) model as stated below:

$$\Delta^{ko}TFS_t = \alpha_o + \alpha_i \sum_{i=1}^{n} \Delta^{ki}Z_{t-q} + \alpha_6(ECM_{t-i}) + \mu_t \tag{7}$$

However, if the co-integration test fails to sail through, we will no longer estimate equation 6 and 7 but rather equation 4. But based on the afore-mentioned theoretical postulates we shall use the ARDL approach to co-integration (ARDL - ECM) developed by Pesaran, et al (2001) as used in Sarka (2007).

3.1.2 Model 2

Model 2 shall be used to capture the second objective. Thus, we specify the model as:

GDP = F (TPS, PRCY, PUCY, IRS, EXR) (8)

where

GDP = Gross Domestic Product (*Proxy for economic growth in Nigeria*) at current market prices.

TPS = Total Private Savings (*made up of savings, time and demand deposits in the commercial banks as a proxy*)

PRCY = The Ratio of Commercial Banks' private sector credits to GDP. *(Measures the degree of bank loan financing to the private sector in the economy).*

PUCY = The Ratio of Commercial Banks' public sector credits to GDP

IRS = Interest Rate Spread (*measures the difference between maximum lending rate and deposit rate). Proxy for Incidence of Investment.*

EXCR = Exchange Rate

To make equation (8) fit for computation, we present it as;

GDP = β₀ + β₁TPS + β₂ PRCY + β₃ PUCY + β₄ IRS + β₅EXR + μₜ (9)

To enable us measure the rate of growth of GDP, equation 9 transforms to a semi – log (log - lin) model. (See Gujarati, 2007:182). This will also ensure numerical accuracy. Equation (9) transforms into a semi log model as follows.

In $GDP_t = \beta_0 + \beta_1 TPS_t + \beta_2 PRCY_t + \beta_3 PUCY_t + \beta_4 IRS_t + \beta_5 EXR_t + \mu_t$... (10)

Equation (10) is the general model specification for objective (2). This model assumes that all the variables are well behaved. That is each of the variables is stationary at order zero. Otherwise, equation (10) translates to:

$$\Delta^{fo}\ln GDP_t = \beta_o + \beta_1\,(\Delta^{f1}TPS_{t\text{-}i}) + \beta_2(\Delta^{f2}PRCY_{t\text{-}i}) + \beta_3(\Delta f^3\,PUCY_{t\text{-}i})$$
$$+ \beta_4(\Delta^{f4}IRS_{t\text{-}i}) + \beta_5(\Delta^{f5}\,EXR_{t\text{-}1}) + \mu_t \tag{11}$$

where:

Δ = Difference operator

T = Time

Equation (11) assumes that:

$$F_0 \neq F_1,\ F_2,\ F_3,\ F_4,\ F_5$$

Else, if f_0 is equal to any of f_1, f_2, f_3, f_4, f_5 then a test for co – integration will be carried out between the endogenous variable and that explanatory variable (s). If the unit root test shows evidence of co – integration, we introduce an error correction mechanism. The equation (11) translates to an Error Correction Model (ECM) as shown below:

$$\Delta^{fo}\ln GDP_t = \beta_o + \beta_1\,(\Delta^{f1}TPS_{t\text{-}i}) + \beta_2(\Delta^{f2}PRCY_{t\text{-}i}) + \beta_3(\Delta f^3\,PUCY_{t\text{-}i})$$
$$+ \beta_4(\Delta^{f4}IRS_{t\text{-}i}) + \beta_5(\Delta^{f5}\,EXR_{t\text{-}i}) + \beta_6(ECM)_{t\text{-}i} + \mu_t \tag{12}$$

where: β_6 = Speed of adjustment

$ECM_{t\text{-}1}$ = Error correction mechanism of the previous year.

In order to ensure that our model is kept as simple as possible (i.e. parsimonious), equation (12) is transformed into an Auto-regressive Distributed Lag (ARDL) model as stated below:

$$\Delta^{fo}\ln GDP_{t} = \beta_{o+} + \theta_i\,(\Delta^{fo}\ln GDP_{t\text{-}i}) + \beta_i\sum_{i=1}^{n} \Delta^{fi}Z_{t\text{-}j} + B_6(ECM_{t\text{-}i}) + \mu_t \tag{13}$$

I=1

where $Z_{t\text{-}j}$ = vector of all other explanatory variables as contained in equation (10) apart from ECM.

ARDL (1, 3) shall be used to avoid unnecessary loss of degree of freedom. Also to avoid specification error in our ARDL model, a simulation process shall be applied. However, caution will be taken as not to totally marginalize the core variables of the research.

Note that if in the cause of model simulation, our auto regressive variable ($\Delta^{fo}\ln GDP_{t\text{-}i}$) becomes marginalized; then equation (11) translates to only Distributed Lag (DL) model as shown below:

$$\Delta^{fo}\ln GDP_t = \beta_0 + \beta_i\sum^{n} (\Delta^{fi}Z_{t\text{-}j}) + \beta_6(ECM_{t\text{-}i}) + \mu_t \tag{14}$$

i=1

However, if the test of co integration fails to sail through, we will no longer estimate equation 13 and 14, rather equation (11).

3.2. Justification of the Models

The two models for this study were carefully chosen to capture all the objectives of the study. The major characteristics of an econometric analysis are incorporated in the model specifications in a systematic manner. This study employed an Autoregressive Distributed lag to Co-integration approach (ARDL – ECM), which is a highly statistical technique/approach to determining the co-integration relation in time series data samples for validity (Ghatak and Siddiki, 2001).

3.3. Estimation Procedure

The time series properties of the data will be examined using the Ordinary Least Square (OLS) technique .The choice of OLS is due to its popularity in estimating time series econometric models. The parameters estimates of OLS regressions normally have the Best Linear Unbiased Estimator (BLUE) property.

The estimation commences with a unit root test to confirm the stationarity states of the variables that entered the model. In order to test for stationarity of the data used in this study, the Augmented – Dickey Fuller (ADF) test will be used. The first step is to test for stationarity at level, without constant and trend. If the variables are non – stationary, then the next step is to difference and test for the stationarity of differenced variables. If the variables become stationary after first difference then it is concluded that the variables are integrated of order one i.e. I (1).

After that, co- integrating regression will be obtained from the normalized coefficients of the model generated from co integrating vector. Should co-integration exist, the Error Correction Model (ECM) will be estimated by applying the ECM version of ARDL where the speed of adjustment to

equilibrium will be determined. In all, the diagnostic tests of the stochastic properties of the models will be carried out.

3.4. The Unit Root Test

To test for the stationarity of the data, we employ the Augmented Dickey Fuller (ADF) univariate unit root test. (Dickey – Fuller, 1981) equation (15) expresses the model for the ADF test when only a constant is included.

$$\Delta Sav_{t = \beta1+\beta2}Sav_{t-1+}\sum_{i=1}^{m} \acute{\omega}i\Delta_{Savt-1+\varepsilon t} \tag{15}$$

Where ΔSav_t is the differenced savings variable. $\beta1$ is the intercept parameter, $\beta2$ is the mean reversion parameter, $\acute{\omega}i$ is the coefficient of the lagged domestic savings variable, **m** denotes the number of lags needed for bank credits, and εt is the white noise error term at time t.

The null hypothesis therefore, if that Nigeria's domestic savings has a unit root, Lag selection (*value of m*) will be determined by the Akaike information criteria.

3.5. Data Sources

The data for the study was obtained from the *Central Bank of Nigeria* (**CBN**) statistical bulletin (various issues) and *National Bureau of Statistics* (**NBS**). All data series are annual and span the period 1970 - 2006.

4. Empirical Results

4.1 Stationary Test on TPSY

D = first difference operator
DD = second difference operator
L = logging
Critical values; 5% = -.952, 1% = -2.639 ***1%, **5%, *10%

Table 2. Unit root tests

Variable	t-adf	Δ	Lag	t-lag	t-prob
DRIR	-5.6724**	15.636	1	1.9519	0.0603
DDRIR	-7.4509**	20.033	1	2.8067	0.0087
DLTPSY	-8292**	0.32807	1	1.3073	0.2010
DDLTPSY	-7.3402**	0.35675	1	2.7874	0.0091
DLPCY	-3.7525**	0.054848	1	-0.23894	0.8128
DDLPCY	-11.142**	0.048428	1	5.1521	0.0000
DLIRS	-6.2512**	0.54202	1	1.4109	0.1685
DDLIRS	-10.769**	0.63562	1	4.4978	0.0001
DLINFR	-6.0853**	0.74255	1	2.3573	0.0251
DDLINFR	-7.8207**	0.96446	1	3.1199	0.0040
DLFSD	-3.9515**	0.18138	1	-0.17292	0.8639
DDLFSD	-6.9727**	0.20902	1	2.0845	0.0457

The result from the table 2 above shows that there exists unit root problem in levels. Hence, variables were differenced to achieve stationarity. Also, we conducted a residual test. The result of the residual test of the long run relationship among the cointegrated variables is shown in table 3 below:

Table 3. Residual Test

Variable	t-adf	∑	Lag	t-lag	t-prob
Residual	-3.0739**	0.036747	1	3.1320	0.0037

NB: ** indicates significant at 5% level, *indicates not significant at 5% level.

The result above shows that the variables are not stationary at order zero and as such unit root is present in the model. The residual test of table 3 confirms the tie between saving and all the explanatory variables at 5% level of significance. This means that these variables are cointegrated. Furthermore, long run relationship is a necessary and sufficient condition for running an error

correction model to check the adjustment to equilibrium following the generation of error correction mechanism from the residual test. ECM_{t-1} is the speed of adjustment to equilibrium in the model.

The empirical result in Table 4 shows that all our explanatory variables were statistically significant as shown by the t-value statistics. The coefficient of determination – R^2 shows that explanatory variables explained approximately 98% of the variation in saving size. Nevertheless, the impact of each variable is discussed in turn below;

Table 4. Modeling TPSY by OLS

Variable	Coefficient	Standard Error	t-value	t-prob	Part R^2
PCY	0.00019	0.00007	2.714	0.0068	0.2267
RIR_{-1}	-0.004754	0.000786	-6.051	0.0000	0.5580
FSD_{-1}	0.30375	0.042015	7.230	0.0000	0.6431
IRS_{-1}	0.0014114	0.0004802	2.939	0.0864	0.2295
$INFR_{-1}$	-0.004837	0.000692	-6.994	0.0000	0.6278
ECM_{-1}	-0.13018	0.10826	-1.202	0.2389	0.0475
R^2= 0.98					
Dw=2.39					

(1) Per Capita Income (PCY)

The result shows that per capita income has a statistically significant positive relationship with the size of saving. Therefore, a unit increase in per capita income at present will lead to 0.00002 units increase in the total private domestic saving in the Nigerian economy. This shows that as per capita income increases total private domestic saving increases though at a very low rate. The significance of this GDP per capita (PCY) is proper and good for the economy because growth in GDP per capita income will engender high savings and investment which will further lead to more growth in capital formation and reinvestment. However, the low level of the positive relationship between PCY and TPSY suggests that majority of the populace on the average, are low income earners. It then implies that an increase in people's disposable income would lead to an increase in their propensity to save.

The Keynesian absolute income hypothesis is found to hold for saving behaviour in Nigeria. The coefficient of per capita income is positive and statistically significant. Thus the Nigerian experience provides support for the argument that, for countries in the initial stages of development, the level of income is an important determinant of the capacity to save. In this respect, our results are consistent with the cross-country results of Hussein and Thirlwall (1999), Loayza et al., (2000) and the results for India of Athukorala and Sen (2004). This implies that the high unemployment rate which results in low disposable income is a strong impediment in raising the saving rate in Nigeria.

Further more, some empirical evidence show that the level of real per capita income has a positive impact on saving rates and that this is usually greater in low-income countries as against richer ones. Loayza et al (2000) found that in developing countries, a doubling of income per capita is estimated to raise long-run private saving by 10 percentage points of disposable income. A direct implication is that development-enhancing policies are an effective means of rising private saving. Pasinetti (1962) have argued that income inequality is an important determinant of saving. Their models focus on functional distribution of income, that is, the type of distribution where income is the sole criteria. Schmidt-Hebbel and Serven (2000) posit that the links between income inequality and saving cause income concentration to have a positive effect on household saving, but a negative effect on corporate and public saving. Thus, they result in an ambiguous effect on aggregate saving.

(2) Real Interest Rate (RIR)

The result shows that real interest rate in Nigeria has a statistically significant negative relationship with savings in the long run .This result does not conform to a priori expectation because theoretically, interest rate is expected to be positively related to savings. However, the result shows that a unit increase in one period lag value of real interest rate will lead to 0.005 unit decrease in total private domestic saving in the Nigerian economy. This reverse sign expectation of real interest rate (RIR) could be due to the following reasons:

(i)   It is high nominal interests that do indeed influence savers in Nigeria rather than the real rate. This is in agreement with Uchendu (1993)'s finding "that nominal savings interest rate is the main determinant of financial savings in Nigeria". However, real rate is still

significant in impacting on savings mobilization in Nigeria. Reduction in inflation rate and proper sensitisation of savers on the vital role real interest rate play on savings mobilization may make investors give due attention to real rates while trying to save or invest in deposit accounts.

(ii) The rudimentary level of development of the Nigerian financial sector in mobilizing savings through interest rate influence.

Some authors, including McKinnon (1973), Shaw (1973), and Athukorala and Sen (2004) have argued that the relationship between real interest rate and saving is positive for a developing economy. They hinge their argument on the fact that the financial markets of these countries are not well developed. In an environment where self-financing and bank loans make up the bulk of investment funds, accumulation of financial saving is determined more by the desire to invest than the desire to live on interest income. As a result, the greater part of household saving will be in the form of cash and near-money assets. Thus, the substitution effect will usually be much greater than the income effect of an interest rate change. Our result is consistent with those of Loayza et al., (2000).

(3) *Financial Deepening (FSD)*

The above results show that financial deepening which represents the level of financial sector development has a positive significant relationship with total private domestic saving. This result conforms with the early theoretical postulation that increased financial deepening leads to greater private domestic saving. As the result reflects, a 1% increase in one period lag of financial deepening, in the long run, will lead to 30% increase in the size of total private domestic saving in the Nigerian economy. This shows that higher degree of financial sector development in Nigeria will positively affect the size of saving in the economy. This can be enhanced by financial liberalization which consists of elimination of credit ceilings, interest rate liberalization, easing of entry for foreign financial institutions, enhanced prudential guidelines and supervision, and the development of capital markets. Loayza and Shankar (2000) find that financial development has led the private sector to increase the durable goods component of their assets. The effect of financial development on saving rates can be separated into a direct short-run impact, which is usually negative, and an indirect long-run impact, which is generally positive (Loayza et al, 2000). However, whether increased financial development itself significantly increases overall propensity to save depends on the extent of substitution between financial saving and other items in the household's asset portfolio. Consequently, the expected signs of this relationship in the private saving function are ambiguous (Athukorala and Sen, 2004).

(4) *Interest Rate Spread (IRS)*

The above regression result shows that interest rate spread (IRS) has a positive significant relationship with the size of domestic savings. That is to say, the higher the interest rate spread, the higher the saving, hence, the greater the level of private domestic savings in Nigeria. As the result reflects, a 1% increase in one period lag of IRS will result to a 0.1% increase in the size of private domestic saving in the long run. This result does not conform to a priori expectation but it is consistent with the finding of Uremadu (2007). He suggests that the positive relationship of spread (IRS) with savings could be due to the fact that people consider some other reasons for financial savings other than the spread and /or yield.

(5) *Inflation Rate (INFR)*

The result above shows that inflation rate has a significant negative relationship with the size of domestic savings in the long run. This implies that persistent inflation has an adverse effect on private domestic saving in the long run. This conforms with theoretical postulations because during inflation period, savings have lesser value than the amount deposited, hence people are discouraged from saving. As the result reveals, a 1% increase in the one period lag of inflation rate will lead to 0.5 % decrease in the size of private domestic saving. Since, domestic inflation rate (INFR) is negatively significant in impacting on volume of savings mobilized in Nigeria, there is need to reduce its bad effect via minimizing all inflationary pressures on the economy. Its rise also affects negatively on both the real interest rate and spread, twin factors that policy makers have to always keep on guard while formulating policies to accumulate adequate savings for investment. The impact of inflation on saving in the life-cycle model is through its role in determining the real interest rate. This is based on the assumption of the absence of real balance effect of inflation and the non-existence of money illusion in people's saving behaviour. Athukorala and Sen (2004) affirm that inflation may not always be neutral

because in the first place, the inflation rate is more difficult to predict in the long run than in the short run. Besides, inflation brings about uncertainty in future income streams, thus resulting in higher savings on precautionary grounds. Lastly, they posit that inflation could influence saving through its impact on real wealth. Skinner (1988) and Zeldes (1989) observe that an increase in uncertainty should raise saving since risk-averse consumers set resources aside as a precaution against possible adverse changes in income. Carroll (1991) shows that uncertainty helps to explain why consumption is highly correlated with income in the case of young consumers who expect their incomes to increase in the future but do not know by how much. Uncertainty also explains why the older population saves a positive amount as they face a lot of uncertainty regarding the length of their life and health costs. Carroll and Samwick (1995a) obtained results which suggest that precautionary saving may account for a large chunk of household wealth. Loayza et al., (2000) find a positive and significant relationship between inflation and private saving rate.

(6) *Error Correction Mechanism (ECM)*

The result shows that 13% of the error in the model can be corrected by the error correction mechanism of the immediate past (ECM_1). This means that the model returns to equilibrium by 13%.This may be due to some structural rigidity that affects savings in the economy, as well as other economic and political factors that inhibit the speed of adjustment between the short run and long run in our domestic economy.

4.2. Modeling GDP by OLS

4.2.1 Stationary Test on GDP

D = first difference operator
DD = second difference operator
L = logging
Critical value; 5% = -1.952, 1% =-2.639 ***1%, **5%, *10%

Table 5. Stationarity test

Variable	T-ADF	Δ	Lag	t-lag	t-Prob
DLGDP	-2.5092*	0.32838	1	-1.4319	0.1625
DDLGDP	-6.9666**	0.33415	1	2.24882	0.0321
DLTPS	-1.5006	0.13577	1	-0.76821	0.4484
DDLTPS	-6.6445**	0.12965	1	2.3177	0.0275
DLPRCY	-2.9157**	0.35815	1	-1.2664	0.2151
DDLPRCY	-11.170**	0.29484	1	5.1781	0.0000
DLPUCY	-3.0410**	0.19415	1	-2.7959	0.0089
DDLPUCY	-5.9384**	0.21874	1	0.95704	0.3459
DLIRS	-6.2733**	0.54066	1	1.4293	0.1632
DDLIRS	-10.781**	0.63465	1	4.5093	0.0001
DLEXR	-2.7350**	0.34051	1	-0.80567	0.4268
DDEXR	-6.4919**	0.359	1	1.8835	0.0694

The result from the table above shows that there is no suspicion of the presence of unit root at 5% level of significance.

Table 6. Modeling GDP by OLS

Variable	Coefficient	Standard Error	t-value	t-Prob	Part R^2
Constant	4.6753	0.83761	5.582	0.0000	0.5179
$LTPS_{-1}$	0.37482	0.44253	0.847	0.4039	0.0241
LPRCY	0.73124	0.15297	4.780	0.0000	0.4407
$LPUCY_{-1}$	0.20251	0.089402	2.265	0.0311	0.1503
$LIRS_{-1}$	0.24757	0.10996	2.251	0.0321	0.1487
$LEXR_{-1}$	0.27853	0.095128	2.928	0.0066	0.2282
R2= 0.99					
Dw= 1.85					

NB: ** Indicates significant at 5% level, * Indicates not significant at 5% level.

The above result shows that out of five explanatory variables four of them were statistically significant while total private saving (TPS) was not statistically significant. The coefficient of determination R^2 shows that explanatory variable explained approximately 99% of the variation in gross domestic product which is the proxy for economic growth. Nevertheless, the impact of each variable is discussed in turn below:

(1)   Total Private Saving (TPS)

The regression result shows that total private saving is positively related to economic growth proxied by the gross domestic product. As the result reflects, at one period lag, the elasticity of total private saving to GDP is 0.37. In other words, a 1% increase in TPS leads to 37% increase in GDP in the long run. This implies that increased saving will enhance the growth of the Nigerian economy. This conforms to a priori expectation since increased domestic savings will lead to greater availability of investment fund which will lead to greater capital formation, increased productivity, and higher growth of the economy. However, this result is not statistically significant which could be as a result of the low savings culture of the Nigerian populace.

(2)   Bank Credits to Private Sector (PRCY)

As the result reflects, PRCY has a statistically significant positive relationship with economic growth. This implies that as bank loans to the private sector increase, we expect that a rational consumer will put that into good use, and as such boost the economic growth of the country. This conforms to a priori expectation since increase in bank credits to the private sector will enhance private sector transactions level and investments within the economy and subsequently accelerate the growth of the economy. However ,the result shows that the elasticity of bank loans to private sector is 0.73.This means that the degree to which economic growth increase as a result of a 1% increase in PRCY is 73%.This result further   reinforces the significance of private sector development in contributing to economic growth of the nation. The greater the level of funding and support given to private sector by banks, the higher its contribution to the acceleration of economic growth. This is consistent with the finding of Azege (2007) and Orji (2009).

(3)   Bank Credits to Public Sector (PUCY)

The result shows that PUCY has a statistically significant positive relationship with economic growth proxied by GDP. This reveals that economic growth is significantly enhanced by increase in government expenditure funded by borrowing from the banks. This government funding by borrowing is done through the bond market. Hence, this result conforms to a priori expectation since increase in government expenditure will increase output and boost economic growth. However, as the result reflects, the elasticity of PUCY to GDP is 0.2 at one period lag. This implies that the degree of responsiveness of economic growth to a 1% increase in bank loans to the public sector is 20%.Since government or public sector has a direct influence on the economy, one cannot underestimate the impact of government expenditure on projects funded by private banks on the economy.

(4)   Interest Rate Spread (IRS)

Our regression result reflects that interest rate spread (IRS) has a statistically significant positive relationship with economic growth. The result shows that at one period lag, the elasticity of economic growth to IRS in the long run is 0.25.This implies that the degree of responsiveness of economic growth to a 1% increase in IRS is 25% in the Nigerian economy. Since economic growth hinges on the availability and accessibility of loans at the right prices, investment spending and capital formation would be encouraged so long as the projected net returns on investment yields a profitable income (Uremadu, 2007).

(5)   Exchange Rate (EXR)

We can deduce from our regression result that exchange rate has a statistically positive relationship with economic growth (proxied by GDP). This does not conform with the theoretical postulation that as the exchange rate appreciates against the domestic currency, net exports fall and GDP, which is the proxy for growth, decreases as well. But for the Nigerian economy, as reflected in the result, elasticity of GDP to EXR at one period lag is 0.3.This implies that the degree or responsiveness of economic growth to a 1% increase in exchange rate is 30% in the long run. However, this result reveals that as exchange rate continues to increase in favour of the Nigerian economy, in the long run it will lead to increase in economic growth.

5.   Conclusion and Recommendations

This study has investigated the determinants of bank savings and the impact of bank credit on economic growth in Nigeria. Following the behavioral pattern of the variables of this study we adopted two impact models, error correction distributed lag model and distributed lag model. The result of the error correction distributed lag model shows that all the explanatory variables were statistically significant. Also, the coefficient of determination (R^2) was found high which showed that the explanatory variables were able to account for the total variation of the dependent variable – size of saving. The value of Durbin-Watson Statistic (DW) shows that there was no presence of autocorrelation; hence, the model produced a parsimonious result.

The empirical result of the distributed lag model shows that out of five explanatory variables, only four of them were statistically significant. Such variables include logged bank loans to private sector ,logged bank loans to public sector at lag one, logged interest rate spread at lag one, and logged exchange rate at lag one. Also the coefficient of determination (R^2) is found to be a high which indicates that the explanatory variables were able to account for the total variations of the dependent variable –Gross Domestic Product. The value of Durbin-Watson statistics (DW) shows that there was no presence of auto correlation; the model produced a parsimonious result.

Some major recommendations for policy can be drawn from the analysis above. These include;

1. The focus of development policy in Nigeria should be to increase the productive base of the economy in order to reduce unemployment and improve the per capita income of the people. For this to be achieved, a diversification of our resource base is indispensable. The policy thrust should include a return to agriculture, the adoption and implementation of a comprehensive energy policy, with stable electricity as critical factor, the establishment of a viable iron and steel, industry, the promotion of small and medium scale enterprises and a serious effort at improving information technology. Increase in per capita income and reduction in unemployment will lead to greater services which will consequently drive growth through investment and capital formation.

2. Government should gear its efforts towards reducing domestic inflation in order to arrest its negative impact on both real interest rates and spread. The recent move by the Central Bank of Nigeria to adopt inflation targeting is a step towards the right direction if the necessary macro economic environment is put in place for its implementation.

3. There is need for government to pursue financial sector development because from our analysis we discovered that financial deepening will encourage increase in the size of saving. When the size of saving is increased, enough bank loans will be available for both the private and public sector which will enhance economic growth. To this end therefore, there is need to develop our financial intermediaries towards greater effectiveness and efficiency. A sound financial system instills confidence among savers such that resources are effectively mobilized to increase productivity in the economy.

4. There should be determined effort by the monetary authorities to bridge the widening gap existing between lending rate and savings rate, so that the people will be fully motivated to save in a bid to generate needed loanable funds for investment in Nigeria.

5. In line with one of NEEDS financial sector strategies, exchange rate in Nigeria should be stabilized within favourable boundaries and made more competitive to enhance Nigeria's export promotion targets thereby discouraging unwholesome importation of ostentatious goods which reduces people disposable income and savings ability.

6. The structure of credit allocation by the commercial banks should be made to favour the private sector more than the public sector since the impact of credit on economic growth is more from the private sector than the public sector.

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