# Effect of Interest Rate on Savings Mobilization in Nigeria

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## ABSTRACT

The study examines the extent at which interest rate affects savings mobilization in Nigeria. The study is hinged on the modified variant of McKinnon and Shaw hypothesis that accounts for the link between savings mobilization and interest rate. ARDL model was used in the study to test for co-integration for the long run and the unrestricted error correction model for the short run contemporaneous dynamics. Data gotten from CBN annual report and World Economic Outlook covers the period; 1986-2022 was used for the study. Accordingly, the study finds out that savings mobilization is significant but have negative responsive to changes in nominal interest rate both in the short run and long run. Also, the study further finds out that the effect of prime lending rate on savings mobilization is significant but has positive response in long run as against its significant negative effect in the short run. Thirdly, it was observed that maximum leading rate had significant positive effect on savings mobilization in the short run while inflation rate exerted significant negative effect on savings mobilization contrary to the latter significant positive response to changes in M2-GDP ratio in the short run. The study recommended the need for government to consider a reduction from the current double digit to single digit particularly in nominal interest rate and prime lending rate in order to stimulate savings through investment in Nigeria. Finally, monetary authorities may consider a moderation rise in price level thereby encouraging people to save.

**Keywords**: Savings Mobilization, Interest Rate, ARDL Estimation, Monetary Authority.

**JEL: E43, E41, D53, G51**

## INTRODUCTION

The role of savings in stimulating investment through interest rate channel most especially in emerging economies such as Nigeria has been acknowledged in the literature. This takes the form of intermediation process which involves moving funds from surplus spending sectors or units of the economy to deficit spending sectors or units where the development of the financial sector, savings habit as well as degree of financial literacy of the populace are vital ingredients for the entire process (Oyewole, Adeniyi, Lawal, Ajayi and Adekunle, 2023). Interest rate plays a crucial role with regards to savings mobilization in the process of economic growth (Obi, 2022). In trying to discuss the importance of savings, different schools of thought have emerged. For instance, the classical economics led by Ricardo, Mill, Say, Marshall and Pigou argued that saving is an increasing function of the rate of interest. Ahmed, Frank, Falaye, & Ewunuga, (2017),

submitted that savings is interest elastic and that a positive relationship exists between saving and interest rate. They averred that the decision to save depend solely on the rate of interest. Thus, at any particular level of income, the amount saved will increase with any rise in the rate of interest.

McKinnon (1973) and Shaw (1973) also argued that for the developing country, the net impact of a change in real interest rate on saving is likely to be positive. This is because, in the typical developing economy where there is no robust market for stocks and bonds, cash balances and quasi-monetary assets usually account for a greater proportion of household saving compared to what is obtained in developed economies. The authors submitted that an increase in holding financial assets (financial deepening) by the public promotes savings mobilization, which leads to higher levels of savings, investment, production, growth as well as poverty alleviation. To them therefore, financial market intervention by governments in developing countries is believed to induce savings mobilization. On the other hand, the Keynesian economics were of the view that saving is primarily a function of income rather than the rate of interest. In his General Theory, Keynes (1936) submitted that the major determinant of both countries' level of consumption and savings is the country's national income. He opined that the higher the income, the higher the level of consumption and saving. He equally maintained that-even at the individual level, a person daily income, to a large extent, determines his consumption and savings. Keynes recognized this when he found a positive relationship between consumption and disposable income.

However, it is good to know that savings represent that part of income not spent on current consumption. Hence, the problem of mobilizing savings has always been the challenges facing policy makers in Nigeria (Chetē, 1999). Available statistics from the Central Bank of Nigeria and the World Bank put saving rate at 6% in 1981 rose to 9.5% in 1986 and increased to all-time high of 18.8% in 1990. Since 1991 upward saving rate in Nigeria has been on the decline as it stood at 10.6% in 1995 and five year later, it further declined to 5.3% in 2000. The free fall in saving rate continued reaching 3.8% in 2005 and a further decline to 2.2% in 2010. Meanwhile, saving rate witnessed marginal increase recording 3.6% in 2015 before declining to 3.2% in 2020 and a further decline to all-time low of 1.6% in 2021. However, by December 2022 saving rate rose to all-time high of 4.18% according to data published by World Bank data base (2022). The fluctuations in the level of savings affected much of Nigeria's development prospects, growth performance and fiscal domination. It is with this understanding that Nnanna, Englama and Odoko (2004) averred that funds mobilization by banks has been quite low due to a number of reasons such as low savings deposit rates as well as poor banking habits of the people. However, saving deposit rate experienced upsurge in the early 1980s and fall thereafter. Another disincentive to funds mobilization is the attitude of the deposit money banks towards small savers. Most bankers in Nigeria target corporate customers and government deposits and pay little or no attention to the small savers (Obi & Ezeanyeji, 2019).

In order to stem the deterioration in the target variables, government had rolled out a number of policy interventions aimed at boosting savings with concomitant impact on investment, output and employment. Some of these interventions include the Structural Adjustment Programme introduced in 1986 with emphasis shifted from public sector to the private sector, the rolling-plans, Nigerian Economic and Empowerment Development Programmes (NEEDs) in 2004 and Transformation Agenda. Also, there was the introduction of Federal Government FADAMA projects which connotes low-lying and flood plain areas covered by shallow aquifers that are found along Nigeria's river system (Ezeh et al, 2012). The projects are designed to increase the incomes of the users of land and water resources on a sustainable basis thereby increasing savings. Likewise, there is the Anchor Borrowing programme of the CBN which is intended to create a linkage between anchor companies involved in the process and small holder farmers of the required key agricultural

commodities with ultimate goal of enhancing per capita income that will stimulate savings mobilization. There are others such as Traders' Money and N-Power. The primary aim of all these intervention was to promote financial reform, financial deepening which automatically helps in stimulating saving mobilization. Despite the array of these interventions, robust saving mobilization has not been successfully achieved. Accordingly, the economy has continued to record low savings and disappointed performance in terms of investment drive all of which leads to low growth, increased poverty and unemployment levels. Hence, it is the effort of this study to look at the effect of interest rate on savings mobilization in Nigeria and to proffer solutions to the problems. This however makes the current study Germane.

## REVIEW OF RELATED LITERATURE

The literature is replete with various studies that have investigated how interest rate affected savings and mixed findings were reported. In an attempt to ascertain the effects of interest rate on savings mobilization, Epaphra (2014) investigated the determinants of national savings in Tanzania for the 1970 – 2010 periods using the OLS technique. The variables used are total savings, percent of GDP, population growth rate, consumption expenditure, disposable income, inflation rate and life expectancy. The results revealed that inflation has a negative impact on national savings. It further show that real GDP growth causes (Granger) national savings and not otherwise. The author submitted that policies geared towards real GDP growth rate should be given first priority if the national savings trend is to be enhanced overtime.

In Myanmar, Tun (2019) assessed the impact of real interest rate on deposit mobilization using quarterly data for the period, 2013/14-2017/18. Additionally, other explanatory variables include money supply, GDP per capital as well as average exchange rate. A multiple regression technique was employed on a sample of 24 deposit money banks by the study. In what follows, the study found that deposit mobilization is significant and positively responsive to changes in real interest rate, exchange rate and per capita GDP in Myanmar. In what appears as a surprise, the study could not found any relationship between money supply and deposit mobilization with the period of review. The study recommended that interest rate is a crucial variable to be considered by policy makers in their decision to influence deposit mobilization.

In Zambia, Muntanga (2020) examined the extent at which interest rate affects savings and investment using data for the period 1980-2018. The study which found evidence of significant positive effect of interest rate on savings and negative on investment utilized the simple linear regression techniques. The study affirmed that the overall savings had significant positive effect on investment in Zambia and suggested a moderate interest rate on loans and advances that will stimulate investment and savings mobilization. Meanwhile, Tang, Tan and Chua (2020) employed co-integration and variance decomposition to examine the long-run determinants of private savings in Malaysia with data period from 1980-2016. The study found out that financial sector development, modified dependency ratio and private disposable income had significant positive effect on private savings in Malaysia. Contrariwise, macroeconomic uncertainties and female sex ratio had deleterious effect during the review period.

The studies of the relationship between savings mobilization and interest have uncovered mixed findings. Thus, Obi and Ezeanyeji (2019) investigated the relationship between saving mobilization and interest rate deregulation policy in Nigeria covering the period, 1981-2017. The dependent variable for the study is the real saving rate whilst the explanatory variables consisted of real interest rate, inflation rate, gross capital formation, real GDP growth rate and a dummy of regime policy shift. The study employed the Johasen co-

integration approach and error correction methodology for the purpose of short run and long run analysis. Accordingly, the study found evidence of long run equilibrium relationship between the dependent and the regressors. Specifically, the study could not found relationship between any of the explanatory variables and savings mobilization in Nigeria in the period under study. The study concluded that the policies of government over the years, most of which were unfavorable, accounts for less than optimal performance of the deposit money banks thereby affecting their ability to grant credit to private sector. The finding of the study is not consistent with Dabwor, *et al*., (2018) and Okpe (2018) who found positive relationship between interest rate and savings mobilization in Nigeria.

In a recent study, Obi (2022) documented a study on the response of savings mobilization to changes in interest rate in Nigeria coving the period 1981-2020. Likewise, the study assessed how interest rate affect investment by employing the technique of co-integration and error correction model for the purpose of long run and short run analysis. The rest of the explanatory variables were prime lending rate, maximum lending rate as well as monetary policy rate. The study found evidence of significant positive effect of interest rate on savings mobilization in Nigeria. According, the study suggested an increase in the deposit rate to stimulate savings mobilization in Nigeria. The findings gave supportive claims on a number of prior studies which include Udude (2015), Uremadu (2018) and Okpe (2018) whose studies established positive effect of interest rate on savings but contrary to the findings of Obi and Ezeanyeji (2019).

Ogunlokun and Oguntuase (2023) assessed the effect of interest rates on the saving incomes of the financial sector in Nigeria. The study disaggregated interest rates into lending rate, monetary policy rate, deposit rate and Treasury bill rate. The study employed ARDL model on a data covering 1987-2020. Accordingly, the study found evidence of long run equilibrium relationship between the dependent and the explanatory variables. Surprisingly, the study found out that only leading rate had significant negative effect on the financial sector savings in Nigeria as the rest of the interest rate variables were statistically insignificant. The study recommended the determination of lending rate by the market forces of demand and supply.

**Trend of Saving Mobilization in Nigeria**

The Nigerian economy, like any other, comprises of the public and private sector, with both engaging in investment expenditure. Both sectors have to save and /or borrow in order to meet their investment requirements. The immediate source of funds is their own savings. The government, which represents the public sector, collects revenue for both tax and non-tax sources. After meeting its expenditure requirements on purchase of goods and services; the government uses whatever surplus there is to increase its stocks of capital i.e. investment. Again, this holds for economic agents in the private sector. When investment expenditure exceeds the levels of savings, the private and the public sectors mainly borrow from financial institutions. In mobilizing funds from the surplus units of the economy, banks incur some costs mainly in interest payments on deposit accounts. In order to recover the cost of deposit mobilization and other operating overheads, banks lend at higher interest rates.

Table 2.1 indicated that total savings rate as a ratio of GDP at current market price between the periods of 1986 to 1990 recorded an average of 6.5% but witnessed decline thereafter reaching the trough of 4.4% between 1996 and 2000. The savings rate maintained a single digit of less than 6% between 2001 and 2007. From 2008 and 2022, savings rate as ratio of GDP witnessed improvement as it recorded a double digit reaching all-time high of 15.0% in 2022 and the trough at 10.2% in 2011.

**Table 2.1:  Structure of Savings in Nigeria**

| Year | Total Savings (₦ billion) | Growth Rate of Total Savings (%) | GDP at current Basic Prices (₦ billion) | Total Savings as Ratio of GDP at current Basic Prices (%) |
|---|---|---|---|---|
| 1986-1990 | 21.9 | 19.4 | 333.6 | 6.8 |
| 1991-1995 | 78.9 | 31.6 | 1524.5 | 5.8 |
| 1996-2000 | 235.0 | 29.9 | 5171.0 | 4.4 |
| 2001 | 488.1 | 26.7 | 8234.5 | 5.9 |
| 2002 | 592.1 | 21.3 | 11501.5 | 5.2 |
| 2003 | 655.7 | 10.7 | 13557.0 | 4.8 |
| 2004 | 797.5 | 21.6 | 18124.1 | 4.4 |
| 2005 | 1317.0 | 65.1 | 23121.9 | 5.7 |
| 2006 | 1739.6 | 32.1 | 30375.2 | 5.7 |
| 2007 | 2686.8 | 54.4 | 34675.9 | 5.8 |
| 2008 | 4247.8 | 58.1 | 39954.2 | 10.6 |
| 2009 | 5708.0 | 34.4 | 43461.5 | 13.1 |
| 2010 | 5941.4 | 4.1 | 55469.4 | 10.7 |
| 2011 | 6526.7 | 9.9 | 63713.4 | 10.2 |
| 2012 | 8021.2 | 22.9 | 72599.6 | 11.1 |
| 2013 | 9603.5 | 19.7 | 81010.0 | 11.9 |
| 2014 | 11451.6 | 19.2 | 90137.0 | 12.7 |
| 2015 | 11763.9 | 2.7 | 95177.7 | 12.4 |
| 2016 | 14034.2 | 19.3 | 102575.4 | 13.7 |
| 2017 | 14464.6 | 3.1 | 114899.3 | 12.6 |
| 2018 | 16053.4 | 11.0 | 129086.9 | 12.4 |
| 2019 | 18229.5 | 13.6 | 145639.1 | 12.5 |
| 2020 | 21990.5 | 20.6 | 154252.3 | 14.3 |
| 2021 | 25648.3 | 16.6 | 176075.5 | 14.6 |
| 2022 | 27661.2 | 7.8 | 184223.4 | 15.0 |

*Sources: CBN Statistical Bulletin (2021),*

*IMF World Economic Outlook (2022)*

*World Bank data bases (2022)*

Prior to the deregulation of the banking sector, interest rates were administratively determined by the Central Bank of Nigeria (CBN). Both the deposit and lending rates were fixed by the CBN on the basis of policy decisions. At that time, the major goals were socially optimum resource allocation, promotion of orderly

growth of the financial market, and reduction of both inflation and the internal debt service burden on the government.

In Table 2.2, the structure of nominal interest rate, prime lending rate and maximum lending rate is depicted where the periods between 1986 and 1990 recorded an average of 15.1% for nominal interest rate, 19.4% for prime lending rate and 20.2% for maximum lending rate. The Table further indicated that the rates increased in the periods of 1991-1995 but declined in the succeeding periods of 1996 to 2000 anchoring at 11.1% for nominal interest rate, 18.2% for prime lending rate and 22.9% for maximum lending rate. A critical look at Table 2.4 further revealed that the structure of interest rates is one that is characterized with high fluctuations, rising and falling between 2001 and 2022 with the lowest rates of 4.7% for nominal interest rate in 2011, 11.6% for prime lending rate in 2021 and 18.4% for maximum lending rate in 2007. On the contrary, the rates reached all-time high of 16.5% for nominal interest rate in 2002, 30.7% for prime lending rate in 2003 as well as 30.6% for maximum lending rate in 2017 and 2019 respectively.

**Table 2.2: Structure of Interest Rates in Nigeria**

| Year | Nominal Interest Rate | Prime Lending Rate | Maximum Lending Rate |
|------|------------------------|---------------------|-----------------------|
| 1986-1990 | 15.1 | 19.4 | 20.2 |
| 1991-1995 | 17.9 | 21.9 | 26.0 |
| 1996-2000 | 11.1 | 18.2 | 22.9 |
| 2001 | 16.3 | 18.3 | 21.3 |
| 2002 | 16.5 | 24.9 | 30.2 |
| 2003 | 13.0 | 30.7 | 22.9 |
| 2004 | 13.3 | 19.2 | 20.8 |
| 2005 | 10.8 | 18.0 | 19.5 |
| 2006 | 8.4 | 17.3 | 18.7 |
| 2007 | 8.1 | 16.9 | 18.4 |
| 2008 | 11.8 | 15.1 | 18.7 |
| 2009 | 12.9 | 19.0 | 23.6 |
| 2010 | 5.7 | 17.6 | 22.5 |
| 2011 | 4.7 | 16.0 | 22.4 |
| 2012 | 7.2 | 16.8 | 23.8 |
| 2013 | 5.5 | 16.7 | 24.7 |
| 2014 | 9.2 | 16.6 | 25.7 |
| 2015 | 8.7 | 16.9 | 26.7 |
| 2016 | 6.2 | 16,9 | 27.3 |
| 2017 | 10.9 | 17.6 | 30.6 |
| 2018 | 10.3 | 19.3 | 28.2 |
| 2019 | 10.2 | 15.5 | 30.6 |
| 2020 | 6.5 | 12.3 | 28.6 |
| 2021 | 6.3 | 11.6 | 28.1 |
| 2022 | 12.3 | 14.1 | 28.3 |

*Source: CBN Statistical Bulletin (2021)*

*IMF World Economic Outlook (2022)*

It must be emphasized that the financial sector reforms and liberalization is expected to narrow the difference between deposit and lending rate as a result of competition that follow the liberalization exercise. However, this difference in savings-interest rate margins has been dramatically high in Nigeria in the post-reforms than in the pre – reforms era. Within the reforms periods, an increase in the margin between lending and deposit rates was expected, as banks needed time to adjust their cost structure during the changing scenario. The margin is also expected to narrow as more efficient business practices were embraced sequent to increasing competition and as credit demand stabilized. The problem of continuous increase in lending rates and low deposit rates has being a major challenge in today's Nigeria industry. In Nigeria, the level of funds mobilization by banks is quite low, following some challenges including: low savings deposit rates; poor banking habits or culture of the people (Nnanna, *et al*, 2004). Fig 2.1 shows the trends of savings rate and interest rates during the periods, 1986 to 2022. The trends revealed that the variables are highly volatile most especially interest rates. This fluctuation in interest rates account for low savings mobilization in Nigeria.
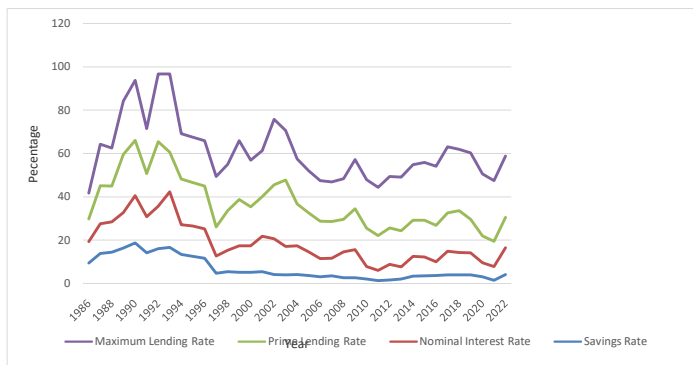


**Fig 2.1: Trend of Savings and Interest Rates in Nigeria, 1986-2022**

Some people have argued that the disincentive to funds mobilization is predicated on the attitude of banks towards small savers. For instance, savings deposit rate was found to have continued to drop from all time high of 18% in 1990, 16.7% in 1993, 10.6% in 2004 to 3.38% in 2014 and further to 3.2% in 2020 before rising marginally to 4.2% in 2022 (WEO, 2022). This scenario is depicted in Fig 2.2 which shows clearly the trends of savings rate and nominal interest rates. It has been argued that saving and time deposits in banks is by far the single most important component of saving in Nigeria and has witnessed continuous growth over the years. Its contributions to total savings such as national provident fund, Federal savings Bank, Federal

Mortgage Bank, Life insurance funds and others have however, been mixed. In 1970, savings in banks consisted of 98.8% of total saving with this figure reducing gradually to 89.5% in 1980, and further to 78% in 1990. From then, the percentage of savings in total saving in banks has shown an upward trend, rising to 89.1% in 2000. Since 2003 to date, this percentage has been 100% showing that it has become the only component of saving (Nwachukwu & Odigie, 2011).
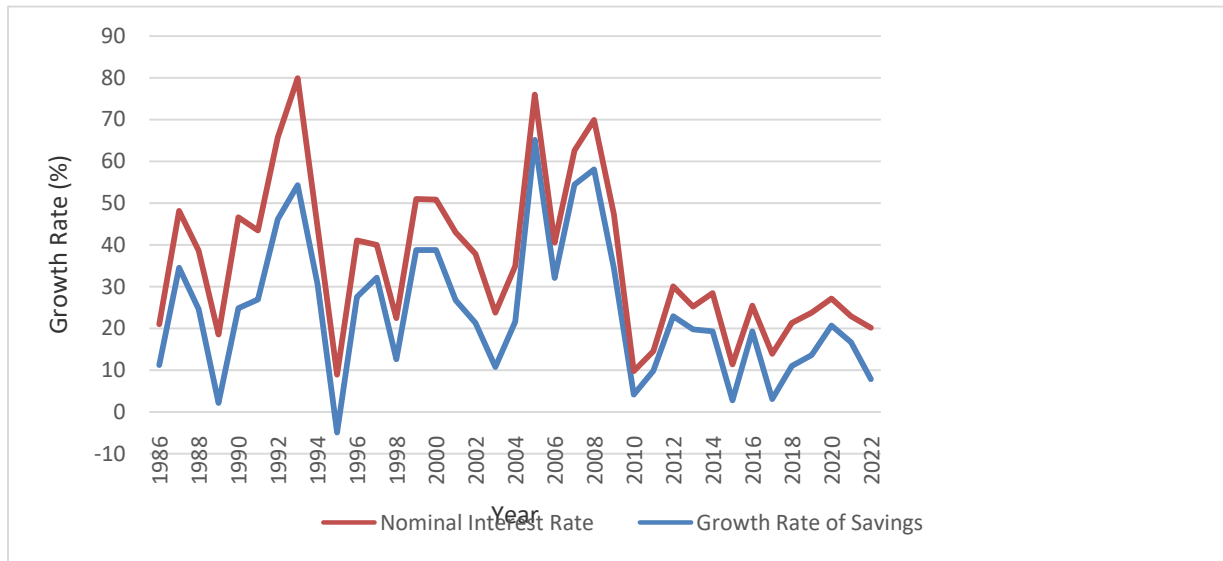


**Fig 2.2: Trend of Interest rate and Savings Rate in Nigeria**

It has been revealed that funds from household savings are relatively cheaper and more stable than government deposits that are very volatile and expensive due to unpredictable oil price where these deposits are desired (Ahmed, *et al,* 2017). The problem of mobilizing savings and deposits has always been the bane of economic growth that promotes investment for development. The savings rate in Nigeria has been declining since the first oil price shock and in the early 1990s, revealing large increasing dispersion of savings rate. Prior to the deregulation of interest rate in Nigeria, the prevailing rates of interest were regenerated by government through the apex bank. This was meant to guide the economy to follow the desired direction of growth. However, it was realized that, the low rates of interest that prevailed could not be sustained. Accordingly, the economy therefore witnessed the introduction of SAP which shifted emphasis from public sector to private sector. The goal was, to among other things, encourage private domestic-savings, encourage private domestic investment and encourage capital formation in order to enhance economic growth.

## METHODS AND PROCEDURES

This section outlines the theoretical framework and estimation techniques utilized by the study.

### Theoretical Framework

The theoretical framework on which this study is hinged is derived from Mckinnon-Shaw (1973) financial hypothesis. According to this theory, government intervention in the financial market creates distortions which often lead to inefficient operation in the financial market. The involvement of government in the financial market could frustrate the banking sector from making maximum profit. The failure of banks and

other financial system have severally been blamed on government intervention through interest rate regulation, ceiling on deposit and loan rates and official restrictions such as policies, laws, regulation of taxes

etc. which do not allow financial institutions to operate optimally. The McKinnon-Shaw hypothesis is predicated on the following model:

$$(S/Y) = f(Y/P, d - \pi) \tag{1}$$

Where:

S/Y is defined as gross national saving while Y/P is the real income and d-$\pi$ is the real interest rate. In order to suit the present study, equation (1) is moderated as follows:

$$SAV = f(\omega) \tag{2}$$

Where:

SAV = national savings

$\omega$ = is a vector of the independent variables.

## Model Specification

The study adopts the modified variant of the McKinnon and Shaw (1973) and employed some of the variables suggested by Epaphra (2014), Uremadu (2018) and Fatukasi et al (2019) in their studies to achieve the objectives of the study.

$$SAV = f(INTR, PLR, MLR, INFR, M2/GDP) \tag{3}$$

In log stochastic term, equation 3 becomes

$$InSAV = \alpha_0 + \alpha_1 InINTR_{t-1} + \alpha_2 InPLR_{t-1} + \alpha_3 InMLR_{t-1} + \alpha_4 InINFR_{t-1} + \alpha_5 InM2/GDP_{t-1} + \varepsilon t \tag{4}$$

Where:

SAV = Total national savings (measured as the sum of domestic plus private saving).

INTR = Nominal interest rate.

PLR = Prime lending rate

MLR = Maximum lending rate

INFR = Inflation rate

M2/GDP = Measure of financial deepening (where M2 refers to broad money supply and GDP is defined as gross domestic product at 2010 constant price).

**Technique of Analysis**

The autoregressive distributed lag (ARDL) bounds test approach which was originally developed by Pesaran and Pesaran (1997) and expanded by Pesaran et al (2001) was employed in the study. The model testing procedure starts by conducting the bounds test for the null hypothesis of no co-integration. The calculated F-statistic is compared with the critical value tabulated by Pesaran, et al. (2001). The choice of this model followed preliminary studies and also in line with several previous studies in the development literature (see Dabwor et al, 2018). The ARDL model can be estimated as follows:

$$\Delta InSAV_t = \alpha_0 + \sum_{i=1}^{K} \alpha 1i \Delta InSAV_{t-1} + \sum_{i-1}^{K} \alpha 2i \Delta InINTR_{t-1} + \sum_{i=1}^{K} \alpha 3i \Delta InINFR_{t-1} +$$

$$\sum_{i=1}^{K} \alpha 4i \Delta InM2/GDP_{t-1} + \beta_1 InSAV_{t-1} + \beta_2 InINTR_{t-1} + \beta_3 InNFR_{t-1} \qquad (5)$$

$$+ \beta_4 InM2/GDP_{t-1} + \varepsilon_t$$

The model uses F-statistics for the bound test which is obtained by imposing restrictions on the long-run estimated coefficients of one period lagged of the variables which should be equal to zero. Notably, the null hypothesis of no cointegration states that H0: β1 = β2 = β3 = β4 = 0 is tested against the alternative hypothesis H1: β1 ≠ B2 ≠ B3 ≠ B4 ≠ 0.

Pesaran et al (2001) provide bounds on the critical values for the asymptotic distribution of the F-statistic. In each case, the lower bound is based on the assumption that all of the variables are I(0), and the upper bound is based on the assumption that all of the variables are I(1). Hence, if the computed F-statistic falls below the lower bound we conclude that the variables are I(0) and therefore no co-integration is possible by definition. If the F-statistic exceeds the upper bound, we can say that long run co-integration exists. Finally, if the F-statistic falls between the bounds, the test is inconclusive. If a stable long-run relationship is supported by Wald test the second stage is to estimate the long run model (i.e., the β component in equation 3.14) which is represented by error correction term that capture the speed of adjustment between the short and the long run.

$$\Delta InSAV_t = \alpha_0 + \sum_{i=1}^{K} \alpha 1i \Delta InSAV_{t-1} + \sum_{i-1}^{K} \alpha 2i \Delta InINTR_{t-1} + \sum_{i=1}^{K} \alpha 3i \Delta InINFR_{t-1} +$$

$$\sum_{t-1}^{k} \alpha 5i \Delta InM2/GDP_{t-1} + \lambda ECT_{t-1} \qquad (6)$$

The ECTt−1 is the error correction term obtained from the estimated long-run equilibrium relationship and λ is a parameter which measures the speed of adjustment to the equilibrium level after a shock. The sign of the ECTt−1 must be negative and significant to ensure that long-run equilibrium exists between the variables. Pesaran et al (2001) argue that it is important to ascertain the constancy of the long-run multipliers by testing the parameters stability of the parsimonious model. Accordingly, the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of square of recursive residuals (CUSUMSQ) have been developed to assess the parameter constancy and equation of whom is detailed in Brown, Durbin and Evans (1975). The CUSUM and the CUSUMSQ must stay within the 5% critical bound to show that the model is stable.

**Unit root test analysis**

This test was conducted to ensure that none of the variables were integrated of order 2 in order to avoid break down of the model as the ARDL model reqires only the integration of order 0 and 1 variables. Accordingly, the Augumented Dicky Fuller (ADF) and Phillip-Peron tests as well as the Zivot-Andrew test for structural breaks were deployed for this purpose.

# RESULT AND DISCUSSION OF FINDINGS

**Table 4.1** presents the result of stationarity test using the ADF and PP test levels. The results indicated that the variables are stationary either at level differencing or at first differencing at the 5% level of significant.

**Table 4.1: ADF and PP Stationarity test results**

| Augmented Dickey Fuller (ADFF) Test | | | | Phillips-Peron (PP) Test | | | |
|---|---|---|---|---|---|---|---|
| Variable | Level | First Diff | Order | Level | First Diff | Order |
| LSAV | -0.90 | -4.15 | 1 | -0.20 | -4.09 | 1 |
| INTR | -3.94 | - | 0 | -3.96 | - | 0 |
| LPLR | -3.33 | -2.85 | - | -5.21 | - | 0 |
| LMLR | -4.08 | - | 0 | -4.15 | - | 0 |
| INFR | -3.96 | - | 0 | -3.22 | -5.47 | 1 |
| M2-GDP | -0.55 | -4.76 | 1 | -0.55 | -4.76 | 1 |
| C.V = 5% | -3.54 | -3.54 | | -3.54 | -3.54 | |

*Source: Author's computation using Eview 12.0*

Essentially, our effort geared towards conducting a study void of misleading findings led us to test for the presence of multi-collinearity using the Variance Inflation Factor (VIF). The presence of multi-collinearity in a study could bias the findings as the independent variables tend to influence one another rather than influencing the dependent variable.

**Table 4.2: Results of VIF (Savings Model)**

| Variable | Coefficient | VIF |
|---|---|---|
| Constant | 1.05 | N/A |
| INTR | 0.00 | 2.95 |
| PLR | 0.00 | 1.87 |
| MLR | 0.00 | 2.64 |
| INFR | 0.00 | 1.33 |
| M2-GDP | 0.00 | 6.85 |

*Source: Extracted from Eview 12*

According to the rule of VIF, a value between 1 and 5 indicates moderate multi-collinearity in the variable and should be included in the model. Although, some authors have suggested that a VIF value of less than 10 is acceptable while a value above 10 is an indication of high multi-collinearity and is a cause for concern (James et al., 2013). Accordingly, all six variables in satisfy the VIF rule and are included in our models.

In table 3, savings mobilization is a function of nominal interest rate, prime lending rate, maximum lending rate inflation and financial inclusion. The ARDL model ( 4,2,2,1,1,1 ) which is presented in Table 4.3 is not for interpretation at this level but primarily to derive the bound co-integration test.

**Table 4.3: ARDL Model Estimation**

**Dependent Variable: LSAV**

| Variable | Coefficient | Std error | tt-statistic | Probability |
|---|---|---|---|---|
| Constant | -0.10 | 0.35 | -0.28 | 0.78 |
| LSAV(-1) | 1.65 | 0.21 | 7.72 | 0.00 |
| LSAV(-2) | -0.39 | 0.26 | -1.52 | 0.15 |
| LSAV(-3) | -0.19 | 0.24 | -0.81 | 0.43 |
| LSAV(-4) | -0.18 | 0.17 | -1.07 | 0.30 |
| INTR | -0.01 | 0.01 | -0.96 | 0.35 |
| INTR(-1) | -0.02 | 0.01 | -1.72 | 0.10 |
| INTR(-2) | -0.02 | 0.01 | -2.54 | 0.02 |
| PLR | 0.00 | 0.01 | 0.56 | 0.58 |
| PLR(-1) | 0.02 | 0.01 | 1.84 | 0.09 |
| PLR(-2) | 0.04 | 0.01 | 4.11 | 0.00 |
| MLR | 0.02 | 0.01 | 2.51 | 0.02 |
| MLR(-1) | -0.01 | 0.01 | -1.50 | 0.15 |
| INFR | -0.00 | 0.00 | -1.07 | 0.30 |
| INFR(-1) | 0.00 | 0.00 | 1.05 | 0.31 |
| M2-GDP | 0.03 | 0.01 | 3.66 | 0.00 |
| M2-GDP(-1) | -0.02 | 0.01 | -2.36 | 0.03 |
| $R^2$ | 0.99 | | | |
| DW-Stat | 2.00 | | | |
| F-Stat | 1323.4 | | | |

*Source: Extracted from Eviews 12*

In what follows, a battery of diagnostic tests shown in Table 3 was conducted on the model to ensure it is free from residual problems. Accordingly, the tests revealed that the model passes the diagnostic tests and is satisfactory as it is normally distributed, serially uncorrelated and has no heteroscedasticity, no specification bias and is considered stable in line with CUSUM and CUSMSQ test.

**Table 4.4 Summary of Diagnostic Tests**

| Test | F-Statistics | Probability | Decision |
|---|---|---|---|
| Jarque-Bera (Normality) Test | 1.22 | 0.54 | Normally Distributed |
| Breusch-Godfrey Serial | 0.06 | 0.94 | No Serial Correlation |

| Correlation | | | |
|---|---|---|---|
| ARCH LM | 0.59 | 0.45 | No heteroscedasticity |
| Ramsey Reset | 2.69 | 0.22 | No Misspecification |

*Source: Extracted from Eviews 12*

Also, the model is considered stable as the CUSUM and CUSUMSQ tests of model stability is achieved if the blue line lies within the two critical boundaries as indicated in Fig 4.1a and Fig 4.1b. Thus, the model is stable as the blue line does not lie outside the two critical bounds and therefore suitable for policy prescriptions.
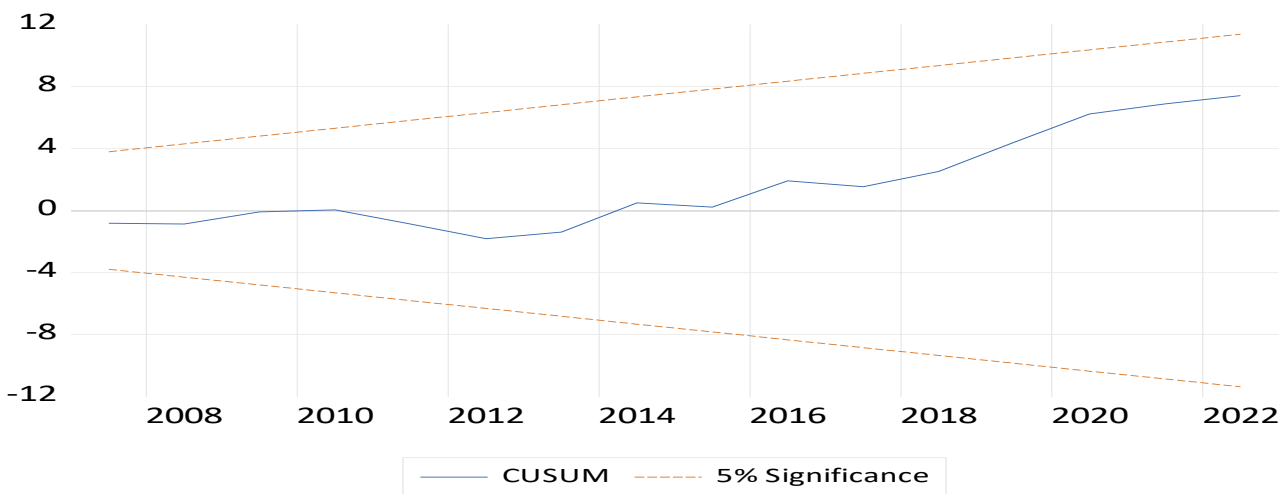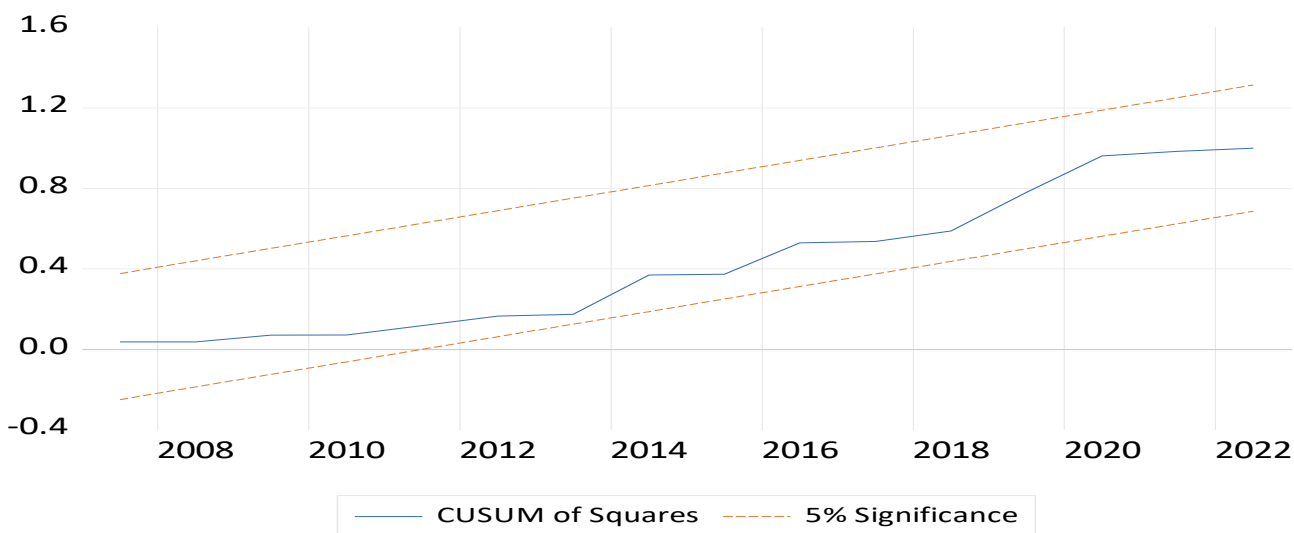
**Fig 4.1: Stability Test (CUSUM)**



**Fig 4.2: Stability Test (CUSUMSQ)**



In Table 4., the bound co-integration test is presented and it can be seen that the F-statistic exceeds the upper critical bound thereby confirming the presence of co-integration between savings mobilization and nominal interest rate together with the control variables.

**Table 4.5: ARDL Bound test for co-integration**

| F-Statistic | 5% Level | |
|---|---|---|
| K | I(0) | I(1) |
| 5 | 2.39 | 3.38 |
| F-statistic = 4.76 | | |

*Source: Extracted from Eviews 12*

With co-integration achieved, the long run dynamic regression is estimated. Therefore, Table 4.6 presents the ARDL long run regression between savings mobilization and nominal interest rate, prime lending rate, maximum lending rate, inflation rate and money supply as ratio of GDP. From the results, there is evidence that these variables explained 99% variation in savings mobilization as suggested by the relatively robust $R^2$. Likewise, the model revealed absence of serial correlation as the DW statistic of 2.0 lies within the autocorrelation region of 1.59-2.41. Also, the negative constant may be interpreted to mean that in the absence of all the explanatory variables, savings mobilization will be negative.

**Table 4.6: ARDL Long run model of Nominal Interest Rate**

**Dependent Variable: LSAV**

| Variable | Coefficient | Std error | t-statistic | Probability |
|---|---|---|---|---|
| Constant | -0.01 | 0.03 | -0.28 | 0.78 |
| INTR(-1) | -0.05 | 0.02 | -2.24 | 0.04 |
| PLR(-1) | 0.06 | 0.02 | 2.83 | 0.01 |
| MLR(-1) | 0.01 | 0.01 | 0.90 | 0.38 |
| INFR(-1) | -0.00 | 0.01 | -0.37 | 0.72 |
| M2-GDP(-1) | 0.01 | 0.01 | 1.51 | 0.15 |
| $R^2$ | 0.99 | | | |
| DW | 2.00 | | | |

*Source: Extracted from Eviews 12*

Therefore, it can be observed from the results that nominal interest rate exerted negative and significant effect on saving mobilization. This implies that a unit increase in nominal interest rate decreases savings mobilization by 0.05% and vice versa in the period under consideration. The findings suggest that a 100% increase in interest rate led to reduction in savings mobilization by 5%. This result gives credence to the findings of Aizenman, *et al*., (2017) in Asia, Samreen and Atiya (2017) in Pakistan and Dabwor, *et al*., (2018) in Nigeria but contrary to the findings earlier reached by Obi (2022). Similarly, the results showed that prime lending rate exerted positive and significant relationship with savings mobilization in the long run. This shows that a 1% increase in prime lending rate leads to 0.06% increase in savings mobilization in the long run. Tsaurai (2017) and Obi and Ezeanyeji (2019) had earlier reached similar findings. Likewise, it can be observed from the study that although maximum lending rate had positive impact on savings mobilization, it, nonetheless, statistically insignificant suggesting that the positive relationship is not to the extent of causing changes in saving mobilization in the long run. This is in line with the findings of Hasan, *et al*., (2017) and Dabwor, *et al*., (2018) who found a significant negative relationship between the two relevant variables.

However, the study further found that the impact of inflation rate on savings mobilization is negative but statistically insignificant. Epaphra (2014) in Tazania, Muntanga (2020) in Zambia and Obi and Ezeanyeji (2019) in Nigeria had earlier reached similar findings. Meanwhile, broad money supply as a ratio of GDP, a proxy for financial deepening or financial inclusion exerted insignificant but positive influence on savings mobilization. This implies that although, a positive association is observed no relationship existed between the control variable and savings mobilization in the long run.

Meanwhile, the short run results are shown in Table 7 which with the symbol D denoting a sign for the short run while ECT captures the speed of adjustment between the long run and the short run. Accordingly, the $R^2$ indicated that the model has a relatively robust goodness of fit as it shows that the independent variables account for 79% variation in savings mobilization. Likewise, the DW statistic reveals absence of serial correlation which was earlier validated with diagnostic tests in Table 4. Therefore, it can be observed from the results that nominal interest rate is negative and statistically significant in affecting savings mobilization in Nigeria in the short run.

**Table 4.7: ARDL ECM of Nominal Interest Rate**

**Dependent Variable: DLSAV**

| Variable | Coefficient | Std error | t-statistic | Probability |
|----------|-------------|-----------|-------------|-------------|
| DLSAV(-1) | 0.765 | 0.114 | 6.70 | 0.00 |
| DINTR | -0.020 | 0.005 | -5.79 | 0.00 |
| DPLR(-1) | -0.036 | 0.005 | -7.45 | 0.00 |
| DMLR(-1) | 0.017 | 0.004 | 4.53 | 0.00 |
| DINFR | -0.003 | 0.001 | -2.17 | 0.04 |
| DM2-GDP | 0.029 | 0.005 | 5.33 | 0.00 |
| ECM(-1) | -0.113 | 0.017 | -6.77 | 0.00 |
| $R^2$ | | 0.79 | | |
| DW | | 2.00 | | |

*Source: Extracted from Eviews12*

A critical assessment of the results further shows that prime lending rate had significant negative effect on savings mobilization as it suggests that a 1% increase in prime lending rate resulted in 0.036% decrease in savings mobilization in the short run. The study gives credence to the finding of Ogunlokun and Oguntuase (2023) but contrary to Obi (2022). Meanwhile, it can be observed from the results that maximum lending rate exerted positive and significant influence on savings mobilization in the short run. For instance, a 100% increase in maximum leading rate leads to 0.017% increase in savings mobilization. This finding is similar to the findings earlier reached by Uremadu (2018), Tun (2019) and Muntanga (2020).

Also, the result indicated that the effect of inflation rate on savings mobilization is negative and statistically significant. This suggests that increase in inflation rate during the period under review resulted in a corresponding decrease in saving mobilization in the short run. The finding gives credence to the findings of Obi and Ezeanyeji (2019). On the other hand, the study found that the effect of M2-GDP ratio is positive and statistically significant in affecting savings mobilization in Nigeria at least during the short run. This finding gives credence to the findings of Obi (2022) and Ogunlokun and Oguntuase (2023). Meanwhile, the ECT

observes the usual negative sign and is highly significant which is what is expected if there is co-integration between the dependent and the explanatory variables. The ECT serves as the speed of adjustment in the event of disequilibrium between the short run and long run periods. For instance, the coefficient of the ECT implies that it takes approximately about 11.3% speed of adjustment a year to correct any disequilibrium.

# CONCLUSION

The study assessed the effect of interest rate on savings mobilization in Nigeria. It modeled array of interest rate variables in order to see which among them are critical factors affecting the growth of savings mobilization in Nigeria. Also, efforts were made to ensure that the validity of the hypothesis was tested to avoid misleading findings and especially that financial conditions do matter in savings behaviour in Nigeria. The fear of market failure which could be disastrous for the economy made the government to embark on deregulation of the economy in 1986 with some sort of controlled regulations by the monetary authority in Nigeria. As a result of which a number of macroeconomic variables such as inflation rate, exchange rate, money supply and interest rate rose sharply with the hope that savings would also rise.

Although, savings rose initially but not in the proportion that could affect investment and the economy significantly. This made the performance of the economy to be growing at less than satisfactory. Government had anticipated that unless and until there is some level of sanity in the financial sector of the economy, envisaged savings mobilization would be a mirage. And, since reforms merely drove the economy into protraction, concrete steps are required to strengthen the entire institutional and financial system. However, against this belief the economy has not performed creditably well giving rise to a number of social challenges like unemployment, poverty that have found expression in numerous social vices such as terrorism, kidnapping, banditry and so on. The contrary findings of this study, most especially for nominal interest rate and prime lending rate, to the Mackinnon-Shaw hypothesis goes to indicate that liberalizing interest rate is necessary but not a sufficient condition required to stimulate the level of savings mobilization in Nigeria. The main conclusion that can be drawn from this study therefore is that focusing all attentions on interest rate as a means of stimulating savings and neglecting other key variables is tantamount to putting all ones' eggs in one basket. Therefore, the need to look in the direction of other variables such as financial inclusion to boost savings mobilization must be emphasized.

## RECOMMENDATIONS AND POLICY IMPLICATIONS

 It is the recommendation of the study that the current level of nominal rate of interest which has maintained double digit for most of the times does not appear attractive to investors thereby affecting investment, output, income and level of savings. It is against this back drop that this study suggests that government may consider single interest rate digit for the economy. Similarly, the monetary authorities may consider a downward review to single digit in the level of prime lending rate since its effect on savings mobilization is negative particularly in the short run. Also, a moderate adjustment in the level of maximum lending rate capable of stimulating savings may be considered by the apex bank since its impact on savings mobilization is significantly positive most especially in the short run. Likewise, the monetary authorities must adopt a contractionary monetary policy decision to address the level of inflation that rapidly reduces the value of money and make savings a poor investment decision. A moderation rise in price level will encourage people to save. Finally, government must introduce financial literacy programs in secondary and tertiary institutions. This will enhance good understanding of finance/ money management that will guarantee teens, a healthy financial life as they transit to adults.

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