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Impact of Interest Rate on Savings and Investment in Nigeria

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Abstract: *The study investigated the Impact of Interest Rate on Savings and Investment in Nigeria. The sources of data used were Central Bank of Nigeria Statistical Bulletin, "Annual Report and Statement of Account, Various Issues "covering the period of 1986 to 2023. The methodology that was adopted in this research work is the simple linear model because of the nature of the variables used. The findings of this work were simply that, the level of investment depends on interest rate, and savings also depend on interest in Nigeria. It was also concluded based on the findings that investment and GDP move in the same direction in Nigeria but savings and GDP move in different direction. The recommendations of the study were that; there should be a differential interest rate policy so as to release the real rates of interest to disclose the scarcity of savings and to stimulate investment through savings. Also, that interest rate should be flexible enough to take into account the realities of our economy.*
Keywords: *Interest Rate, Savings, Investment,* GDP.

Introduction

Background to the Study

The economic shocks of the 1980s and 2000s brought the financial system under stress in Nigeria. This was the result of financial depression. Interest rate plays a vital role in the ability of the economy to attain its optimal output. The IMF (2023) summarizes the basic functions of interest rate in three broad aspects to include firstly, interest rate is the price, paid for using some bodies of capital, and as interest rates rise there is increased supply of loanable funds hence more funds become available for lending. However, higher interest rates discourage investments, making them less attractive. Investors can hardly find profitable investment where they borrow at very high interest rate. Interest rate as a component of cost of capital, affects the demand for and allocation of loanable funds. The applicable rate of interest in this case is the bank lending rate, the changes that affect the cost of capital which influences investor's willingness to invest in real investment and savers to save. In this way, the level of interest (lending) rate could influence growth in financial investment, output and employment in an economy. Therefore, the speculative movement of funds into/out of domestic and foreign assets depends on the level of interest rate (Abdul, 2021). Before deregulation, the level and structure of interest rates in Nigeria were fixed and administratively determined as were exchange rate and wages, the most important consideration which dominated interest rate policy at that time were the impact of interest rate changes on government expenditure and the need to promote investment and growth in the private sector (Adebiyi and Babatope Obasa, 2022). In order to keep the interest payments on public sector borrowing as low as possible, interest rate on government debt instruments were fixed at low level. Obi, (June, 2022), employed econometric techniques of cointegration and error correction mechanism and her results show that interest rate has a significant effect on savings and investment in Nigeria. However, under a system of direct imposition of credit ceiling on banks and in the bid to channel domestic credit to priority sectors, discriminating lending rates were fixed for loans and advances granted by banks to different sectors reflecting the authorities' preferences. Of course, the attendant problems (Adebiyi and Babatope Obasa,2022), which became unimaginable because of the deliberate policy to keep the rate below market determined rates contributed largely to the factors that made deregulation a compelling strategy to adopt. Since deregulation, interest rates have been rising almost uninterruptedly especially in recent years, thus raising the need for study about their determinants under a flexible regime.

Statement of the Research Problem

The prolonged crisis pervading the Nigerian economy has risen to an unexpected point. The present condition of the level of investment and the trend of savings in the country is not encouraging. As a result of this behavior in savings and the level of investment which is unprecedented in the history of the global economic drawbacks? All macroeconomic indices that spell a nations' economic wellbeing at a given point in time portray a rather pitiable and gloomy outlook for the nation. These policies simply point indirectly to an economy trapped in the vicious cycle of stagnation, declining productivity, rising unemployment, and mounting foreign debt, and widening inequality gap. Furthermore, the function of the rate of interest over the years which dictates the behavior of these variables (i.e. investment and savings) is not helping matters. Moreover, interest rate rose over the years following the lifting of the partial control on the interest rate regime of the preceding years. A noticeable feature during the year was the incidence of wide variations in interest rates among the commercial banks. We know that interest rate is determined by investment, savings and other factors but in Nigeria, over the years, it has been difficult to determine the level of the market rate of interest via these channels. Consequently, the roles of interest rates emphasize their significance in the structure of basic prices and indicate the need for study about their determinants under flexible regime.

This study would provide the government with indicators that may help to determine to what degree the government can realize its macroeconomic objectives with appropriate interest rate determination. The indicators can also determine the interaction of interest rate with each variable in the model (i.e. investment, savings, inflation and money supply) to determine growth in an economy. Since a given interest rate can determine the level of investment, savings, consumption, production and growth in an economy, the government can use the indicators generated in this research for government policy reform programs. The study will also provide us with the indicators on how, interest rate and its determinants can be used to achieve a certain level of growth in the GDP.

Research Questions

From the above discussion, the following questions arise:

i. What is the impact of interest rate on investment in Nigeria?
ii. What is the impact of interest rate on savings in Nigeria?
iii. What is the role or impact of savings and investment on GDP in Nigeria?

Research Objectives

The broad objective of the study is to investigate the" impact of Interest Rate on Savings and Investment in Nigeria" while the specific objectives include:

i. To analyze the impact of interest rate on investment in Nigeria.
ii. To analyze the impact of interest rate on savings in Nigeria.
iii. To analyze the impact of savings and investment on GDP in Nigeria.
iv. To provide policy recommendations on how to encourage savings with a minimum interest rate so as to stimulate investment in Nigeria.

Research Hypotheses:

The research intends to test the following hypotheses:
First Hypothesis

H_0: $b_1 = 0$: Interest rate does not impact on savings and investment.

Hi: $b1 \neq 0$: Interest rate does impact on savings and investment.

Second Hypothesis

H_0: $b_1=0$: Investment and savings do not impact on GDP
H_1:$b_1 \neq 0$: Investment and savings do impact on GDP

Decision Rule

The decision rule that will be used in testing our hypotheses is:
Accept H_0 if $t_1 > t_c$

Reject H_0 if $t_1 < t_c$

Where:

H_0 = Null Hypothesis

t_c = t-calculated

t_1 = t-tabulated

Methodology

Introduction

The methodology that will be applied in this research work is the simple linear regression analysis. Three simple linear regression models will be run because there is only one independent variable (interest rate) and two dependent variables (savings and investment) in the first model and one dependent variable (GDP) and two independent variables (savings and investment) in the second model.

Analytical Framework

This research work will be based on the analysis of the various methodologies that will be used. This methodology is the concept of regression analysis which comprises of correlation of coefficient, t-statistical test and standard error. The regression analysis explains how the various variables used in our model are related. It explains to us the relationship between our independent variable (interest rate) and dependent variables (savings and investment) and the relationship between GDP (dependent variable) and savings and investment (independent variables)

Model Specification

The basic model to be used in this research is the regression model also known as the regression function. Due to the nature of our research topic, we will be using two and three inter-dependent regression functions. The reason being that we have two dependent variables (savings and investment) against only one independent variable (interest rate) and one dependent variable (GDP) and two independent variables (savings and investment)
The following model is necessary:

$INV = a + \beta INT + u$…… 3.1

Where:

INV = Investment

INT =Interest rate

β = the slope of the coefficient

α = intercept of the model

μ = error term

The dependent variable (INV) in our model above depends on the value of (INT) in the same function. The dependent variable resents our investment (INV). The independent variable (INT) on equation (3.1) above, represents the rate of interest in our research. Therefore, investment level depends on the rate of interest.

The next model to be specified is the savings and interest rate relationship model:

$SAV= \alpha+\beta INT + \mu$……3.2

Where:

SAV = Savings

INT = Interest rate

β = the slope of the coefficient

α =intercept of the model

μ= error term

From equation (3.1) above, and (3.2) above, we observed that one common independent variable exists between the two dependent variables (savings and investment). This common variable is the rate of interest. However, the response of savings and investment different. We are going to analyze subsequently that, while investment react negatively to interest rate, savings react positively to rate of rest.

For the third model, we have the following multiple regression equation:

$GDP = \alpha + \beta_1 INV + \beta_2, SAV + \mu$…….. 3.3

Where:
GDP= Gross Domestic Product

β_1= Coefficient of investment

β_2= Coefficient of savings

α= Intercept of the model

μ= Error term

Equation (3.3) is a multiple regression equation in which we have the Gross Domestic Product (GDP) as the dependent variable and investment (INV) and savings (SAV) as the independent variables.

The Interest Rate, Investment and Savings Model
The interest rate investment is presented below:
INV = $\square_0$+ *BINT* + *U*…….. 4.1
SAV= $\square_0$+*BINT*+*U*…….. 4.2
The values for each variable are attached below:
INV = 13.93-*0.37801INT* + *U*……..4.3.
S.E (0.26) (0.06)
T-stat (3.32) (-0.04)
R^2 (0.802503) R^2 (0.780559) DW (0.768348)
Where:
INV = level of investment
INT = interest rate
Standard error is in parenthesis
t - value in parenthesis
U = disturbances error term
Dependent Variable: SAV
Method: Least Squares
observations
Table1:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	17.95268 -1	0.586151	30.62808	0.0000
INT	.004043	0.140283	-7.157259	0.0001
R-squared Adjusted	0.850564	Mean dependent var		13.85801
R-squared S.E. of	0.833960	S.D. dependent var		1.038346
regression Sum	0.423106	Akaike info criterion		1.280577
squared resid Log	1.611166 -	Schwarz criterion F-		1.352921
likelihood Durbin-	5.043171	statistic Prob(F-		51.22635
Watson stat	1.797639	statistic)		0.000053

Source: E-Views Output

Dependent Variable: INV
Method: Least Squares
observations
Table 2:

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	13.93125 -	0.261271	53.32097	0.0000
INT	0.378140	0.062530	-6.047341	0.0002
R-squared Adjusted	0.802503	Mean dependent var		12.38913
R-squared S.E. of	0.780559	S.D. dependent var		0.402599
regression Sum	0.188596	Akaike info criterion		-0.335458
squared resid Log	0.320115	Schwarz criterion F-		-0.263114
likelihood Durbin-	3.845020 1	statistic Prob(F-		36.57033
Watson stat	.768348	statistic)		0.000191

Source: E-Views Output

Analysis And Discussion of Findings

Looking at our estimates in our first model (equation 4.3), the co-efficient of lending rate (interest rate) is given by (-0.378). It is calculated t-values are given by (tc53.32) and (tc=-6.04) for the intercept and the slope respectively. The model is considered at 5% level of significance. And to that effect, its tabulated t-values both for the intercept and the slope is given as (1.83). From our decision rule, the null hypothesis will be rejected and the alternative hypothesis will be accepted since our t-calculated is greater than our t-tabulated (i.e. 53.32 or -6.04>1.83).
Therefore, the findings that interest rate and the level of investment is negatively related is significant.

For the second model (equation 4.4), the co-efficient of the regression (i.e. interest rate) is (1.004) and its calculated t-values and tabulated t-values are given by (30.62) for the intercept, (7.15) for the slope and (1.83) at 5% level of significance. From these values, the null hypothesis is also rejected at 5% level of significance that our B=0 meaning that the rate of interest is not related to the level of savings.

That makes us accept our alternative hypothesis. This is because the t-calculated is greater than the t-tabulated (i.e. -7.15>1.83). Therefore, our findings are statistically significant. The value of the R^2 for the two models are; 0.8025 and 0.8505 for equation 4.3 and 4.4 respectively (i.e. 80.25% and 85.05%). These values are quite high which demonstrated how best it is the dependent variable on the independent variable.

Considering the slope of the two models, our

SAV = 17.95 — 1.004INT + *U*…… 4.4
(Se = 0.58)(Se = 0.14)
(tc = 3.62) (tc = -7.15)
R^2 = 0.850564
R^2 = 0.833960
D.W = 1.797639
Where;
SAV = level of savings
INT = level of savings

INT = Interest rates
Se = standard error in parenthesis
tc = t – value in parenthesis
U= Error term

Our models above indicate that there are variables that depend on another. From the two models above (i.e. equation 4.1 and 4.3) show that the levels of investment depend on the rate of while in the second model (equation 4.2 and 4.3) show that savings also depend on the rate of interest.

The results obtained from the interest rate investment model (equation 4.3) are:

R^2= 0.8025
R^2 0.7805
t = 53.32
tβ = -6.04
t_t = *at* 0.05 *Level of significance* (5%) = 1.83
D.W = 1.76

Result gotten from the interest rate-savings model (4.4) is given below:

R^2 = 0.8505
R^2= 0.8339
D.W =1.79
t = 30.62
tβ= -7.15

t_t= at 0.05 *level of significance* (5%) = 1.83 our apriori expectation on the first model was a negative relationship while our apriori expectation on the second model was positive relationship. That explains that as interest rate increases, the level of investment goes down and as the rate of interest goes down, that makes the level of the level of savings also increased while as the rate of interest falls, the savings level also fall. From the investment-interest rate model (equation 4.3), our expectation is satisfied of the slope beings negative. But our expectation of the second model (equation 4.4) was deflated because it resulted into a negative sign explaining that as interest rate increases, the level of saving increases. Theoretically, this is not true. On the other hand, it could be true in some true-life situation. Some important factors that could make this kind of relationship exist is the price of bonds, shares and other important securities in the capital and money market. According to Keynes, people don't hold money only because of transactionary motive. People also hold money because of speculative purpose. This kind of money is called idle cash balance. This idle cash balance is either saved for interest from the banks or used to buy shares for further gain. If the gain from the shares market is greater than the proposed profit (rate of interest) expected from the banks, savings will drop irrespective of the amount of the interest rate.

The Durbiin Watson for the first and second model when ran on the E-views are 1.76 and 1.79 respectively. This can be approximated to two which explains that there is no problem of auto-correlation.

Interpretation of the third model

GDP = + β_1INV + β2SAV + μ……...4.5

GDP = 1.755 + 1.3091INV – 0.00073SAV + U ……..4.6

From the regresson analysis, the result obtained is further shown below:

R^2 = 0.9088
R^2 = 0.8860
D.W = 0.64
t-tabulated = 1.83
t-calculated = 7.76

The co-efficient of the investment which is given by 1.309 shows that the relationship that exist between GDP and investment is a little bit encouraging and positive and while that of savings is a little low which is given by the negative sign. At the long=run, the GDP of the nation behaves in the same direction with the value of investments but in different direction with that of savings.

In addition, the relationship between GDP, investment and savings is also strengthened by the value of R^2 and the adjusted R^2 which is given by the 0.9088 and 0.8860 respectively. The relationship is therefore very high and therefore satisfies our apriori expectation on this third model which is the impact of savings and investment on GDP in Nigeria.

The Durbin Watson test shows that there is no presence of serial correlation given by the value (0.64).

Finally, the t-statistics is given by the value (0.76) which makes it greatest than the t-tabulated given by the value 1.83.

The above analysis makes us to reject the null hypothesis and accept the alternative hypothesis that there is relationship between GDP, investment and savings.

Decision Rule

Accept Ho and reject H1 if Tt>tc

Reject Ho and accept H1 if Tt<tc

Summary of the Findings

To conclude, we can establish that there is indeed a wide and high relationship between the rate of interest and the level of investment and savings in Nigeria. The co-efficient of correlation of the two models explain a deep relationship between these variables. This relationship simply means that the rate of interest has a high impact on the two dependent variables (i.e. savings and investment). This is indicated by the value of R^2 in which both of them are greater than 75%. In the third model, the analysis of the result shows a relatively high relationship between GDP, savings and investment. This is further accentuated by the values of R^2 (0.9088) and adjusted R^2 (0.8860) respectively. This also shows that they are both greater than 75%.

Conclusion

Based on the analysis above, and the findings we came across, the following conclusions were arrived at:

Firstly, we are set to determine whether there is any relationship among the variables used or not. From the analysis we did, both investment and savings are related to interest rate. In our findings the level of investment shows a negative relationship with interest rate.

Also, savings shows a negative relationship with the interest rate level. The conclusion therefore on this is that as interest rate increases investment falls and as interest, rate drops, the level of investment increases. These findings, explains a normal business situation especially in Nigeria. From the findings on savings; it is concluded that sometimes net savers are rational even when the rate of interest on the money they save is high, savings can still drop. This is because sometimes the price of shares or other securities might attract a lot of profit than the savings rate as proposed by the commercial banks.

Secondly it was also concluded that if the rate of interest goes on increasing, it will reduce the level of investment in the economy and that might affect the growth and development in the nation. In the second model, it was also established that there is impact of savings and investment on GDP.As savings and investment increase the GDP also increase. They therefore move in the same direction. Consequently, recommendations of the study were that; there should be a differential interest rate policy so as to release the real rates of interest to disclose the scarcity of savings and to stimulate investment through savings. Also, that interest rate should be flexible enough to take into account the realities of our economy.

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