Interest rate and investment decisions: the Nigerian scenario

Apere, ThankGod Oyinpreye
Akarara, Ebierinyo Ayebaemi
Department of Economics, Niger Delta University
Wilberforce Island, Bayelsa State, Nigeria

Key words
Interest rate, investment, monetary policy rate, maximum lending rate, savings rate.

Abstract

Interest rate policy is perhaps one of the most controversial policies in Nigeria and has drawn the attention of several scholars, thus, its contribution to the investment base of the economy remains unclear. This paper, therefore, examined the impact of interest rate on investment in Nigeria between the period 1981 and 2015. Secondary data were collected from the Central Bank of Nigeria Statistical Bulletin 2016. The study estimated the Johansen Multivariate Co-integration model and Error Correction Model (ECM) to analyse the data. Results of the co-integration test shows the existence of a long-run relationship between the proxies for interest rate (MLR, MPR, SAVR) and investment proxied by Gross fixed Capital formation (GFCFG). The ECM result revealed that MLR and MPR have negative and statistically significant impact on investment in Nigeria. While SAVR has a positive impact on investment but its impact is not also statistically significant. The ECM also indicates that 40% disequilibrium that occurred in the previous year would be corrected in the current period. This paper concludes that high interest rate inhibits investment, thus, it is recommended amongst others, that monetary policy rate and lending rate be reduced to a single digit to make it attractive for investors to access funds. This would translate to economic growth in the country.

Corresponding author: Apere, ThankGod Oyinpreye
Email address for corresponding author: toapere@rocketmail.com
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1.1 Introduction

All over the world, investment decisions are hinged on the prevalent interest rate in the economy. Interest rate is the price paid for the use of money. It can also be seen as the return paid to the provider of financial resources and it plays a vital role in the re-allocation of scares financial resources from surplus economic units to the deficits units with the aim of facilitating economic growth. Acha (2011) noted that interest rate has fundamental implications for the economy of any nation, either by impacting on the cost of capital, influencing the availability of credit or by increasing savings.

In the past, interest rate policy in Nigeria has been inconsistent due to changes in federal government policies, crises in domestic and international financial markets and changes in the prospects for long term economic growth and inflation. The volatility of interest rates and macro-economic instability in the Nigerian economy has been worrisome. Although Nigeria has embarked on interest rate policies and structural reforms, liberalized her domestic financial market and removed restrictions on capital movement, investment has been mainly in the oil sector of her economy where the country derives approximately 90 percent of her Gross Domestic Product. In terms of diversification of domestic investment to other sectors of the economy, Nigeria has not achieved commensurate amount of her potentials (Chuba, 2005).

The World Bank (2002), observed that the high interest rate in the Nigeria financial system is a reflection of the extremely poor infrastructural facilities and inefficient institutional framework necessary to bring about substantial reduction in the risk associated with financing investment in an extremely traumatized economy. The administration of low interest rate which was intended to encourage investment before the SAP era and during SAP era of 1986 ushered in a dynamic interest rate regime, but it failed to yield the desired result of stimulating investment growth in Nigeria. This was as a result of the inconsistency of monetary policy and inability to formulate interest rate policy that will be a component of the broad policy package aimed at facilitating financial intermediation and monetary management that can include investment spending through low interest rate.

Interest charged on bank loans in Nigeria is well above 20%, serving as a major hindrance to potential investors to access the needed funds for investment purposes that would translate to growth in the economy. Yet, against the backdrop of a slowly contracting economy and sharply rising inflation, which stood at 17.6% as a July 2016, the Monetary Policy Committee (MPC) of the Central Bank of Nigeria (CBN) raised the Monetary Policy Rate (MPR) by 200 basis points to 14.00% in July 2016. This decision has been criticized by some scholars, given the state of Nigeria's shrinking economy and weak labor market (Toni, 2016).

In September 2016, the Manufacturers Association of Nigeria (MAN), the Lagos Chamber of Commerce and Industry and other organized private sectors called on the Federal government to drastically slash interest rate in order to stimulate economic recovery. Also, professional bodies such as Chartered Institute of Finance and Control and the Institute of Fiscal Studies of Nigeria and renowned economists advised the government to urgently review its policies and spend more to attract both local and foreign investors to invest in the economy. It is against this backdrop that this paper examined the impact of interest rate on investment in Nigeria.

This paper tested the validity of the following hypotheses;

1. Maximum lending rate does not have a significant impact on gross fixed capital formation in Nigeria.
2. The impact of monetary policy rate on gross fixed capital formation in Nigeria is not significant.
3. Savings rate does not have any significant impact on gross fixed capital formation in Nigeria.

2. Empirical Review

Davis and Emerenini (2015) studied the impact of interest rate on investment in Nigeria using multi regression analysis. The study found that high interest rate nega tively affects investment in Nigeria. Thus, they advocated that relevant monetary policies be put in place to encourage savings and reduce prime lending rate to genuine investors.

Aysam et al (2004) in their study 'How to Boost Investment in the MENA countries' used their independent variables to include real interest rate, macroeconomic stability, situation reform, external stability, macroeconomic volatility and physical infrastructure. Their study comprised panel of 40 developing countries. They used co-integration techniques to determine the existence of a long-term relationship between investment and its determinants. They found out that almost all the explanatory variables exhibit a significant impact on investment, but higher interest rate appears to exert a negative effect on investment.

Majed and Ahmad (2010) investigated the impact of interest rate on investment in Jordan between 1990 and 2005 using co-integration technique. The study found that real interest rate has a negative impact on investment. An increase in the real interest rate by 1% reduces the investment level by 44%. Okechukwu and Abiodun (2004) investigated the effects of macroeconomic variables on foreign direct investment. The data for their study spans through the period of 1974-1997 using the error correction mechanism and Johansen co-integration test. The study revealed that macroeconomic variables have significant and positive impact on foreign direct investment in Nigeria. Ekwenini (2005), studied interest rate and investment behavior in Nigeria from the period of 1976-2006 using time series data, he found out that the behavior for investment have significant influence on interest rate and inflation rate.

Omoke and Ugwuany (2010) tested relationship between inflation, money supply and investment in Nigeria using Johasen co-integration and granger causality test. The result suggests that price stability can contribute towards increased level of investment. The study found that major determinants of investment were real output, inflation, monetary aggregates and exchange rates. This study never considered the role government expenditure plays in the determination of investment level. Also, Adofu, Abula and Audu (2010) in their study on the changes in Agricultural production since the deregulation of interest rate in 1986 using ordinary least square method to examine data from 1986 to 2005, found that interest rate deregulation has significant and positive impact on agricultural productivity in Nigeria. Within the period under review the empirical analysis also suggested that interest rate played a significant role in enhancing economic activities and as such, monetary authorities should ensure appropriate determination of interest rate level that will break the double-edge effect of interest rate on savers and local investors.

Enyioko (2012) analyzed the relationship between interest rate and bank performance in Nigeria using secondary data and regression and error correction methods, he found that interest rate policies have improved the overall performance of banks significantly especially in the area of Return on Assets (ROA). Okeye and Eze (2013) analyze the effect of interest rate and monetary policy rate on the performance of Nigerian deposit money banks using ordinary least square (OLS) regression analysis and they found out that monetary policy has significant and positive effect on the performance of Nigeria deposit money banks.

4. Research Methodology

The study employed the Ordinary Least Square (OLS) method to estimate the relationship between selected variables. The variables used in this study are gross capital formation, real gross domestic product, lending rate, monetary policy rate and saving rate, of which gross capital formation is the dependent variable while real gross domestic product, lending rate, monetary policy rate and saving rate are the independent variables. The data set used, which ranged from the periods 1981-2015 were sourced from the Central Bank of Nigeria Statistical Bulletin (2015). The Augmented Dickey-Fuller (ADF) Unit Root Test was employed to test the stationarity of the data while Johansen co-integration technique was used to check for the existence of a long-run relationship among the variables. The study also estimated the Error Correction Model to check the speed of adjustment of the parameters back to their equilibrium path if they deviate from their equilibrium path.

Model Formulation and Specification

In order to understand the impact of interest rate on the investment behavior in the Nigerian economy, the study specified a model which states that investment which is proxied by gross fixed capital formation growth (GFCFG) depends on broad money supply growth, maximum lending rate, monetary policy rate and the saving rate.

Mathematically, it is expressed as:

$$FCFG=f(MLR,MPR,SAVR)\text{..................................}(1)$$

Econometrically, this can be stated thus;

$$GFCFG=a_O+a_1MLR+a_2MPR+a_3SAVR+U\text{................}(2)$$

Where;

GFCFG = Gross Fixed Capital Formation Growth

MLR = Maximum Lending Rate

MPR = Monetary Policy Rate

SAVR = Saving Rate

U = Error term or Stochastic term

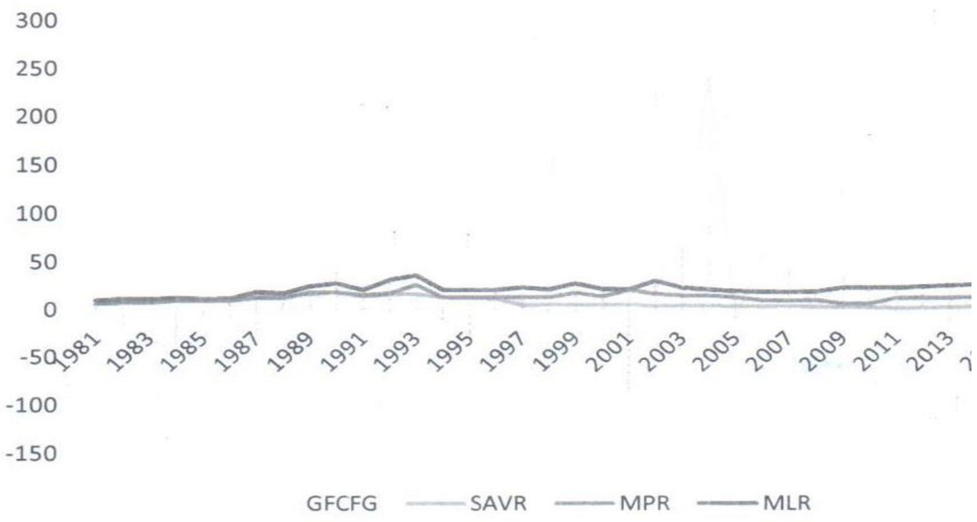
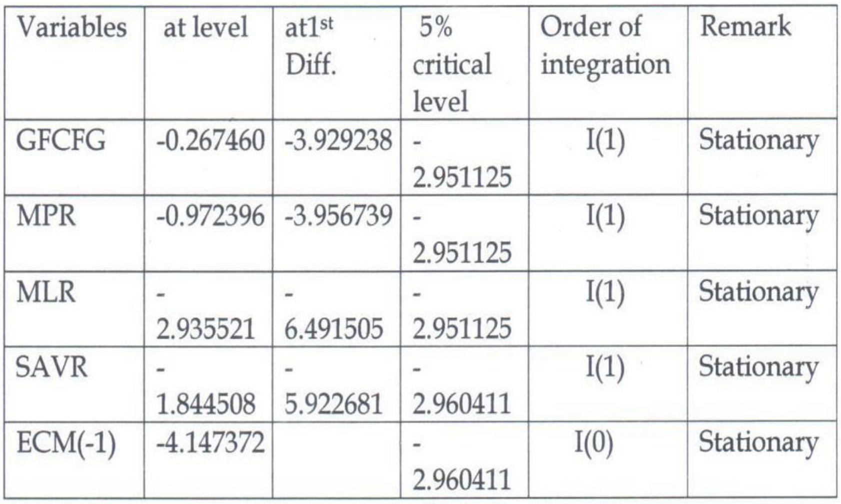


Figure 1: Trend analysis of Gross Fixed capital formation Growth, Savings Rate, Monetary Policy Rate and Maximum lending rate in Nigeria, 1981 to 2015

5. Findings



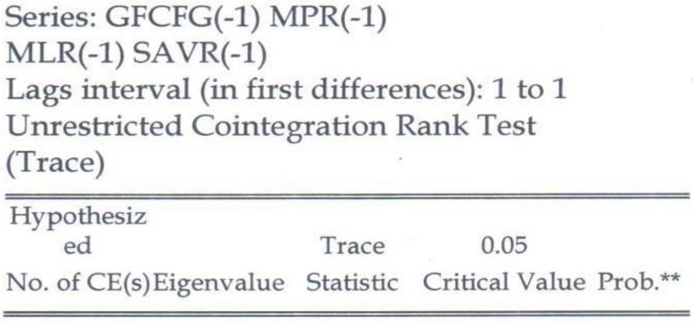
Variables	at level	at1st Diff.	5% critical level	Order of integration	Remark
GFCFG	-0.267460	-3.929238	-2.951125	I(1)	Stationary
MPR	-0.972396	-3.956739	-2.951125	I(1)	Stationary
MLR	-2.935521	-6.491505	-2.951125	I(1)	Stationary
SAVR	-1.844508	-5.922681	-2.960411	I(1)	Stationary
ECM(-1)	-4.147372		-2.960411	I(0)	Stationary

Table 1: Augmented Dickey Fuller Unit Root Test Result.

Source: Authors` computation (2017)

The unit root result in table 1 above shows that all the variables became stationary after differencing once. The residual of the short-run model (ECM) is stationary at level as expected. This is a necessary condition for the estimation of the Johansen cointegration test to test for the existence of long-run relationship among the variables in the model. The result of the cointegration test is presented below in table 2.

Table 2: Johansen Cointegration test result



Series: GFCFG(-1) MPR(-1)
MLR(-1) SAVR(-1)
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test
(Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**

None *	0.833145	141.1120	95.75366	0.0000
At most 1 *	0.668033	85.60244	69.81889	0.0017
At most 2 *	0.610485	51.41811	47.85613	0.0223
At most 3	0.334146	22.18964	29.79707	0.2881
At most 4	0.262445	9.582401	15.49471	0.3142
At most 5	0.004684	0.145535	3.841466	0.7028

Trace test indicates 3 cointegrating equations at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Authors' Computation (2017)

The result of the co-integration revealed that there are three cointegrating equations in the model at 5 per cent level of significance. This shows that there exits three cointegrating vectors in the model and it is a clear indication that there is a long-run relation between the variables in the model. This also endorses the unit root test in Tables 1 above, and it is a necessary condition for the estimation of the error correction model (ECM) which is presented below in table 3.

Table 3: Parsimonious ECM

Dependent Variable: D(GFCFG)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.012929	0.014395	0.898125	0.3925
D(MPR)	-0.277095	0.124013	-2.241297	0.0287
D(MPR(-1))	-0.054946	0.012653	-4.342523	0.0019
D(MLR)	-0.091165	0.037116	-2.456218	0.0185
D(MLR(-2))	-0.028771	0.037776	-0.761621	0.4658
D(MLR(-3))	-0.051490	0.037300	-1.380432	0.2408
D(SAVR)	0.044590	0.086168	0.517477	0.3213

D(SAVR(-1))	0.007902	0.006225	1.269398	0.0712
D(SAVR(-3))	0.030517	0.007259	4.204023	0.0023
ECM(-1)	-0.403110	0.047644	-8.460877	0.0000

$R^2 = 0.77$; Adj. $R^2 = 0.68$; Prob(F-statistic) = 0.000114; F-value = 15.307; Durbin-Watson Stat. =1.88

Source: Authors' Computation (2017)

From Table 3, it is observed that the general error correction model fit in examining the linear combination of Gross Fixed Capital Formation (investment) and all the identified explanatory variables, is not only as a result of the high adjusted R-squared value and the acceptable Durbin Watson statistic but it enables us to check the speed of the adjustment of the model in case any of the variables wonder away from their equilibrium path.

The result shows that a 1 percent increase in Monetary Policy Rate would result to approximately 28 percent reduction in investment (Gross fixed capital formation growth) in the economy. This is a clear indication that any increase in interest rate (MPR) would scare away possible investors as the cost of borrowing goes up. The result further shows that MPR has a negative and significant impact on investment (GFCFG) in Nigeria judging from its probability value of 0.0287, therefore, hypothesis two (2) of the study is rejected. Maximum lending rate also has a negative and statistically significant impact on investment in Nigeria judging from its probability value which is far below the 5 percent level of significance, so hypothesis one (1) of the study is also rejected. It goes to depict that any attempt to increase MLR would result to approximately 9 percent decrease in investment (GFCFG). Savings rate on the other hand has a positive impact on investment in Nigeria, and this impact is not significant statistically at the 5 percent level of significance, thus hypothesis three (3) of the study is accepted. This implies that savings rate and investment are directly proportional in Nigeria. Any increase in saving rate would lead to about 4 percent growth in Gross Fixed Capital formation in the country.

The coefficient of determination (R^2) is 0.77 and it measures the proportion of the variation in investment (Gross Fixed Capital Formation) that is being explained by the independent variables in the model. This figure implies that 77% of the growth in Nigeria's investment (GFCF) is jointly explained by MPR, MLR and SAVR. The other 23% is accounted for by other factors not included in the model of the study. The calculated F-value of 15.307 is significant at 0.05 levels of significance confirms that the overall model is jointly significant. The ECM indicates that 40% disequilibrium that occurred in the previous year would be corrected in the current period.

The D.W statistic is 1.87 indicating absence of autocorrelation in the model. This absorbs the model of any serial correlation among the exploratory variables and makes the model/estimation to be acceptable.

Table 4: Diagnostic Tests

Jargue-Bera Normality test			
Jargue-Bera stat.	0.87	Probability	0.64
Breusch-Godfrey Serial Correlation LM test			
F-statistic	0.96	Probability	0.32

Source: Authors' computation (2017).

The Jargue-Bera normality test shows that the errors in the series are normally distributed. Breusch-Godfrey Serial Correlation LM test shows that the residuals in the estimated model are serially uncorrelated. This point is further authenticated by the Cumulative Sum of Recursive Residual stability (CUSUM) test as shown in figure 2 below.

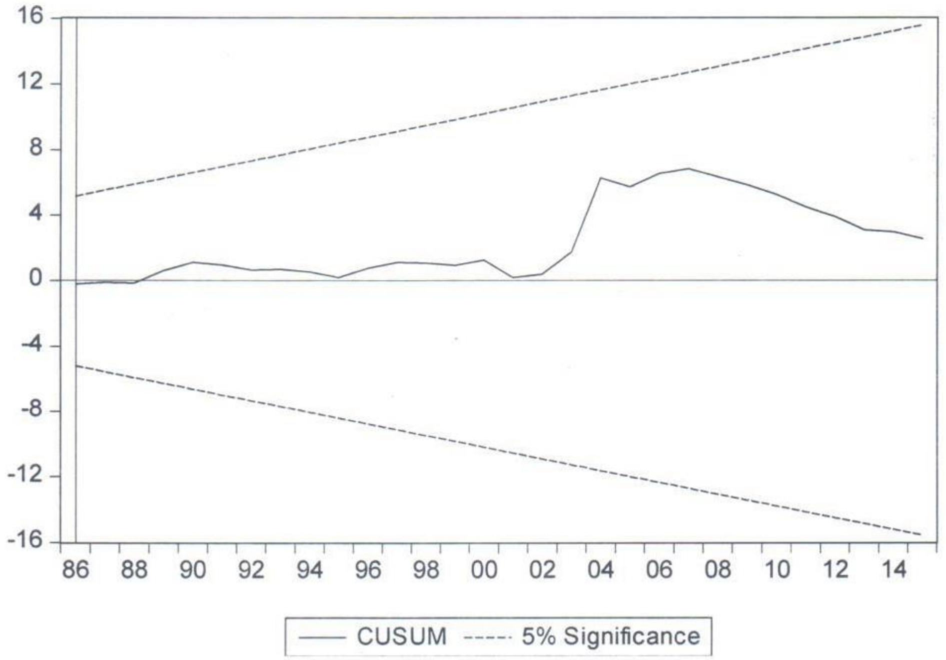


Figure 2: Cumulative Sum of Recursive Residual stability (CUSUM) test

6. Discussions and Conclusions

The paper is an econometric study of the impact of interest rate on investment decisions in Nigeria. It employed the ordinary least square regression method under the Johansen cointegration and ECM framework. The result of the analysis showed that both MPR and MLR have negative and significant relationship with GFCFG (investment) in Nigeria. MPR and MLR which are costs associated to borrowing are significant to investment (GFCFG) because it is widely known that high interest rate discourage investment. SAVR which is the disposable income not spent on consumption is not statistically significant but has a positive impact on investment in Nigeria. This may be due to the fact that people prefer holding idle cash; also it might be due to low level of income of households. The study concludes that interest rate policy has been flawed and has not significantly driven investment in Nigeria. therefore, the following recommendations are made from the findings,

First, the policy makers should embark on a policy that will reduce interest rate as it will stimulate investment and increase output. Proper implementation and co-ordination of policy objective should be rigorously pursued. Secondly, monetary authorities should make policies which would help to boost the saving culture of the people. This could be done by increasing the deposit rate which would make the people to deposit their money in banks thereby increasing the supply of loanable funds. This would lead to a fall in interest rate and eventually rise in investment. Thirdly, since savings encourage investment and high income lead to savings, it is therefore recommended that government as a matter of urgency review the minimum wage of workers in Nigeria upward. This would ensure sufficient saving that will bring about high rate of investment which will eventually lead to economic growth and development.

7. Limitation and Directions for Future Research

There are other variables other than interest rate that affects investment decisions. It is therefore recommended that in the future other variables should be included such as monetary policy rate, money supply, etc.

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