

Interest Rate and Domestic Private Investment in Nigeria

Chioma Chidinma George-Anokwuru, Ph.D

Department of Economics,
Faculty of Social Sciences,
University of Port Harcourt,
East West Road, Choba,
P. M. B 5323, Port Harcourt
Rivers State, Nigeria
chiomanwoga@yahoo.com

Abstract

The study investigated the relationship between Interest rate and Domestic Private Investment in Nigeria. The aim of the study is to examine the impact of interest rates and Private Domestic Investment in Nigeria from 1980 to 2015. Ordinary Least Square Regression was adopted to determine the relationship among the variables employed in the study. Gross Domestic Product served as the independent variable while the Real Interest Rates and Prime Lending Rates were the independent variables. The findings showed that the Real and Prime Lending Rates are negatively related to Private Domestic Investment and statistically significant at 5%. The coefficient of determination showed that only 23% of the variation in the private domestic investment was accounted for by interest rates. This shows that the predictive power of the model is very weak. This paper concluded that the success of promoting the Private Domestic Investment does not depend only on interest rates though it should not be neglected. Based on these findings, the study recommended amongst others that monetary authorities should promote policies to improve deposits and also make available loanable funds as this plays a vital role in promoting Private Domestic Investment in Nigeria.

Keywords: Real Interest Rate, Prime Lending Rate, Growth

1.0 Introduction

There have been several policies in Nigeria which includes Protection and tax holidays for Infant Industries, liberal credit facilities for industrial and Agricultural Investments, interest rate policies amongst others. These measures are geared towards boosting the level of investment in the country which will ultimately grow the economy of the nation. However investment is influenced by several factors which include Exchange Rate Instability, Poor Infrastructure, Political Instability, Poor Credit Ratings, Interest Rates, Exchange rates amongst others.

Interest rate boosts the level of investment as a result interest rate is a major determinant of investment. Interest rate is the price paid for the use of money. Investment is the change in capital stock during a period. Investment plays a very important role in economic growth in a country. Countries rely on investment to solve economic problems such as poverty, unemployment etc.(Muhammad 2004). As such determinants of level of investment become paramount in an economy. Banks as intermediaries move fund from surplus units of the economy to deficit units by accepting deposits and channeling them into the appropriate sectors. The extent to which this could be done depends on the rate of interest and level of development of financial sector as well as the saving and investment habit of the people.

Hence, the availability of investible fund is therefore necessary for all investment in the economy which eventually translates to economic growth and development (Uremadu,2006). Interest rate policy is among the emerging issues in view of the role it is expected to play in the deregulated economy in inducing savings which can be channeled to investment and thereby increasing employment, output and efficient financial resource utilization (Uchendu 1993). Also, interest rates can have a substantial influence on the rate and pattern of economic growth by influencing the volume and disposition of saving as well as the volume and productivity of investment (Leahy, 1993 as cited in Lensink 2000).

The behaviour of interest rates, aids to determine the investment activities and hence economic growth of a country. Investment depends upon the rate of interest involved in getting funds from the market by investors, while economic growth to a large extent depends on the level of investment. Therefore the need to promote an interest rate that will ensure increase in investment and consequently enhancing economic growth cannot be over emphasized.

Over the years, achieving sustainable growth and development in Nigeria has been very challenging. There has been low level of savings and investment, instability in Monetary and Fiscal Policies, Falling Crude Oil Prices in the International Market, High level of interest rate, and Poor infrastructural development amongst others. As a result of the instability in the country, the Nigerian Government with the aid of the International Monetary Fund adopted the Structural Adjustment Programme in 1986. The aim was to restructure the productive and consumption patterns of the economy through the elimination of price distortions and reduction in the dependency on crude oil export and import of raw materials and consumer goods. Prior to the introduction of the Structural Adjustment Programme in Nigeria in 1986, the Monetary Authority, the Central Bank determined interest rate with a specific range between deposit and lending rates. Banks were required to channel specific percentage of their credits to the priority sectors of the economy. The Agricultural and Industrial sectors were the priority as well as the productive sectors of the domestic economy. Despite these measures put in place by the Government, stimulating the productive sectors of the economy have not been achieved. Interest rate has been unstable and high level of Investment has not yet been achieved. This therefore is a justification to examine the effect of interest rate and Private Domestic Investment in Nigeria for a period of thirty-five years (35), 1980 -2015.

The aim of the Study is to investigate the effect of Interest Rate and Domestic Private Investment in Nigeria from 1980 – 2015. The specific objectives are to:

1. Determine the impact of real interest rate on Private Domestic Investment,
2. Investigate the effect of prime lending rate on Private Domestic Investment,

This study is guided by this hypothesis;

H_0 : There is no significant relationship between real interest rate, prime lending rate and Domestic Private Investment in Nigeria.

The remaining sections are organized thus: Section (2) covers the review of theoretical and empirical Literature where related works were also examined. The method of the study, techniques of data analysis was shown in Section (3). The analysis of results was presented, interpreted and discussed in Section (4) while Section (5) includes the summary, conclusion and recommendations.

2.0 Literature Review

Theoretical Framework

The Classical Theory of Interest Rate

This theory of the Classical economists argued that demand for and supply of capital determines the rate of interest. They are of the opinion that investment schedule slope downwards which means that the lower the interest rate, business men will invest more while the savings schedule was described as rising with higher interest rate. According to the Classical Economists, the rate of interest assuming that the level of income is known is the major factor in the determination of level of savings /investment and equilibrium is attainable at that rate of interest where both of them are equal.

The Loanable Fund Theory

They postulated that interest rate is determined by the demand and supply of loanable funds. This view was supported by the new classical theory as propounded by Pigov. They argued that the rate of interest is determined by the intersection of the demand schedule for loanable funds with the supply schedule.

The Modern Theory of Interest Rate

This was propounded by J.R Hicks. He considered both the real and monetary factors that influenced interest rate. Hicks utilized both Keynesian Liquidity Preference Schedule at various income levels in addition to the supply of money fixed by the monetary authorities and the neo-classical saving schedules to arrive at his IS-LM framework.

Keynesian Liquidity Preference Theory

This took a complete different approach to interest rate determination. According to Keynes, Interest Rate was determined by two factors which include the supply of money and the demand of money. The supply side consists of total quantity of money in the economy at any given time. While the demand side is the desire to hold cash.

The Monetarist Theory of Interest Rate

The theory led by Milton Friedman accepted the postulation that interest rate is a monetary phenomenon but rejected the Keynesian analysis of interest rate being determined by monetary demand and money supply. They argued that interest rate is not only determined by the supply and demand for money but also by price expectation factors.

Tobin's Q-Ratio Theory of Investment

This theory is associated with Tobin (1909). In the Tobin's Q-ratio theory of Investment behaviour where Q represents, the ratio of the market value of a firms existing shares (share capital) to the replacement cost of the firm's physical assets (the replacement cost of the share capital). The firm needs money for investment. The money can be raised either by borrowing or by selling shares, equity etc. When the firm sells the share, the buyer buys the share to earn a capital gain from the increase in the market value of shares. The purchaser of share purchases shares when he expects a high capital gain. When stock markets are high, firms are willing to sell equity to finance investment than when the stock market is low. James Tobin was the first to explain this relation between the stock market and investment and that is why it is also referred as "Tobin's q" theory.

The accelerator theory of investment

This theory of Clark (1917) opined that current net investment is a function of changes in income. It explains that firms maintain a stable relationship between the stock of a capital and

aggregate output. The rate of investment is proportional to the change in the output of the economy.

The Jorgenson's Neo-Classical Theory of Investment

The theory of Jorgenson (1971) and others, the desired or optimal capital stock is proportional to output and the user cost of capital (which in turn depends on the price of capital goods, the real rate of interest rate of depreciation and the tax structure). They allow the optimal rate to vary with the price of tax interest rate.

Empirical Review

Green and Villanueva (1991), estimated the effect of macroeconomic variables and policies including interest rates on private investment on a group of developing countries. Their results showed that private investment-GDP ratio is positively related to real GDP growth level of per capita income and rate of public sector investment, while interest rate, domestic inflation negatively affect private investment ratio.

Ologunde et al (2006) examined the relationships between stock market capitalization rate and interest rate in Nigeria. They used the ordinary least-square (OLS) regression method and they found that the prevailing interest rate exerts positive influence on stock market capitalization rate. Eregha (2010) examined variations in interest rate and investment determination in Nigeria and found out that investment has an indirect relationship with interest rate variation and other variables that he used. Briggs

Nwanyanwu (2006) studied the interest rate policy and the performance of the Nigerian Manufacturing Sector using both linear and log-linear specification and found that linear specification appeared better in terms of the regression result during during the (1980-2004) period of study. The result showed that investment in the manufacturing sector is negatively related to interest rates and exchange rates and positively related to foreign capital. Ekwenem (2005), studied interest rate and investment behavior in Nigeria from the period 1976-2006 using time series data, he found out that investment has a significant influence on interest rate and inflation rate.

3.0 Research Methodology

Model Specification

In order to examine the effect of interest rate on Domestic Private Investment, a model is specified which states that Domestic Private Investment (PDI) depends on Real Interest Rate (RIR) and Prime Lending Rate (PLR).

The functional relationship is expressed thus:

$$PDI = f(RIR, PLR) \text{ ----- Eqn. 1}$$

This is transformed into a mathematical relationship as follows;

$$DPI = b_0 + b_1RIR + b_2PLR + \mu \text{ ----- Eqn. 2}$$

Where

PDI = Domestic Private Investment

RIR = Real Interest Rates

PLR = Prime Lending Rates

μ = stochastic or error term

b_1, b_2 = parameters to be estimated

Apriori theoretical expectation

$b_1 < 0, b_2 < 0$

Data was collected from Central Bank of Nigeria (CBN) Annual Statistical Bulletin and National Bureau of Statistics (NBS) various issues.

4.0 Empirical Results and Analysis

Method of Data Analysis

This study employed econometric techniques of Ordinary Least Square method of regression analysis to estimate the relationship between dependent (PDI) and the independent (RIR, PLR) variables

Spurious Ordinary Least Square Regression Model or Not?

R-Square is a statistical measure of how close the data are to the fitted regression line. It is also known as the coefficient of determination for multiple regressions. The R-Square is the percentage of the response variable variation that is explained by a linear model or Explained/Total Variation. In general, the higher the R-Square, the better the model fits your data but you can also have a low R-Square value for a good model, or a high R-Square value for a model that does not fit the data. If the R-Squared value is low but you have statistically significant predictors, you can draw important conclusions about how changes in the predictor values are associated with changes in the response value. A spurious regression model may have a very high R^2 , t-statistics that appear to provide significant estimates, but the results may have no economic meaning. Granger and Newbold (1974) proposed the following 'rule of thumb' for detecting spurious regressions: If $R^2 > DW$ -statistic or if $R^2 \approx 1$ then the regression 'must' be spurious. The regression result presented in table 1 below shows an estimated regression line with private domestic investment (PDI) as the dependent or outcome variable with real interest rate (RIR) and prime lending rate (PLR) as the explanatory or independent variables. The result in table 1 shows that the regression is not spurious since the R^2 of 0.23 is low and also not approximately 1. However, the R^2 statistics is less than the DW. The foregoing therefore implies that any conclusion drawn based on this result will be considered valid and statistically consistent.

Table 1. Ordinary Least Square Regression Model with PDI as the dependent variable

| Variables | Coefficients | t-stat. | Prob. |
|--|--------------|---------|-------|
| Constant (C) | 5049.02 | 4.39 | 0.00 |
| Real Interest Rate (RIR) | -15.62 | -0.86 | 0.40 |
| Prime Lending Rate (PLR) | -192.19 | -3.05 | 0.01 |
| $R^2 = 0.23$ $DW = 0.55$ F-statistics=0.02 | | | |

Source: Author's computation using Eviews 9

Regression Estimates

Constant (C): The coefficient (i.e. 5049.02) of the constant or intercept of the model has a positive sign. This implies that without any change in the explanatory variables (i.e. RIR and PLR), private domestic investment between 1981 and 2015 still increased by ₦ 5,049.02 billion. Moreover, the t-statistics and probability of 4.39 and 0.00 is greater than 2.00 and less than 0.01 respectively; implying statistical significance at 1% significant error.

Real Interest Rates (RIR): The coefficient (i.e. -15.62) of real interest rate has a negative sign. This implies that a unit change in the real interest rate (i.e. RIR) led to a reduction in private domestic investment by ₦ 15.62 billion between 1981 and 2015. However, the absolute value of t-statistics and probability of 0.86 and 0.40 is less than 2.00 and greater than 0.10 respectively; implying statistical insignificance at 1%, 5%, and 10% significant error.

Prime Lending Rates (PLR): The coefficient (i.e. -192.19) of prime lending rate has a negative sign. This implies that a unit change in prime lending rate (i.e. PLR) led to a

reduction in private domestic investment by ₦ 192.19 billion between 1981 and 2015. However, the absolute value of t-statistics and probability of 3.05 and 0.01 is greater than 2.00 and less than 0.05 respectively; implying statistical insignificance at 5% significant error.

Overall Model

R² (Coefficient of Determination): The R² statistics of 0.23 shows that the explanatory power of the model is weak as only 23% of the variation in the private domestic investment was accounted for by interest rates. Hence, the predictive power of the model is very weak.

F-statistics (Overall Significance of the Model): The probability of the F-statistics is 0.02. The statistics implies that the F-statistics is statistically significant at 5% significant error. Hence, the overall model is statistically significant as the explanatory variables combined significantly to significantly predict private domestic investment in Nigeria between 1981 and 2015.

Diagnostics Tests

Normality Test

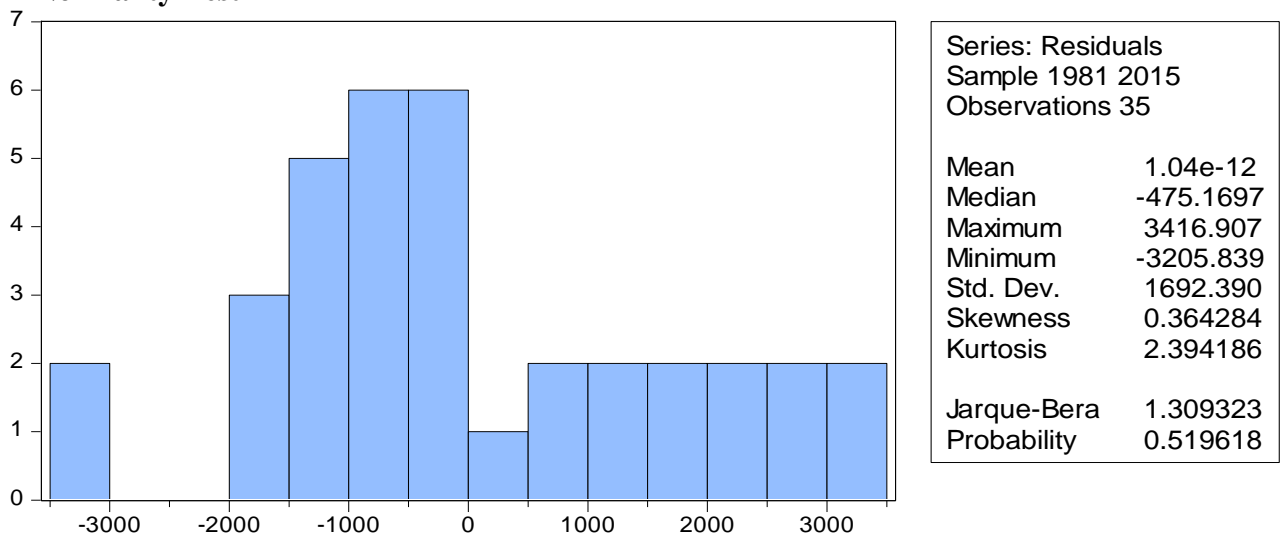


Figure 1.1: Histogram and Descriptive Statistics for Normality Test

Figure 1.1 above shows the histogram and descriptive statistics of the residual, including the Jarque-Bera statistic for testing normality. The rule of thumb for a normally distributed residual is that (a) the histogram must be bell shaped and (b) Jarque-Bera statistic should not be significant. The result shows that the histogram is bell-shaped and the probability of the Jarque-Bera statistic of 0.52 is greater than 0.05 (i.e. 5%). It is therefore fitting to state that the residual of the ordinary least square model is normally distributed.

Heteroscedasticity Test

Table 2. Breusch-Pagan-Godfrey Heteroskedasticity test result

| F-statistic | Prob. F-statistics |
|-------------|---------------------|
| 0.47 | 0.63 |

Source: Author’s computation using Eviews 9

The result presented in Tables 4.2 above shows the F-stat value of 0.47 is low as the probability statistics of the F ratio of 0.63 is also greater than 0.10 (i.e. 10%). The rule of thumb is that if F-stat is statistically significant, then the model is not free from the problem of heteroscedasticity. Since the F-stat and probability statistics are less than 4.00 and is greater than 0.05, we conclude that the model is free from the problem of heteroscedasticity. As such, the estimated model is not spurious and the result useful for policy recommendation.

5.0 Summary, Conclusion and Recommendations

This research empirically examined the relationship between Private Domestic Investment and Interest Rate in Nigeria from 1981 to 2015. Private Domestic Investment served as the Dependent variable while the Real Interest Rate and Prime Lending Rate served as the independent variables. The multiple regression method of econometrics was employed in the estimation. Having concluded the investigation between the variables under the study period, the study found out that there exist an inverse relationship between Private Domestic Investment and Interest Rates in Nigeria. The study concludes that sustainable Private Domestic Investment does not only depend on interest rate. Since Private Domestic Investment plays a vital role in stimulating the economy, the following recommendations are made based on the findings from the study.

1. The financial institutions should be reorganized and restructured
2. Monetary authorities should promote policy that will improve deposits and also make available loanable funds to encourage investment.
3. Policies that will promote the savings culture by the citizens should be encouraged.
- 4 governments should ensure stability in the country to improve domestic investment in Nigeria.

REFERENCES

- Eregha, P.B. (2010). Interest Rate Variation And Investment Determination In Nigeria, *International Business Management*, 4 (2), Pp. 41-46
- Ekwenem (2005). Interest Rate and Investment behavior in Nigeria. *www.iiste.org*
- Granger, C.W., Newbold, P., (1974). Spurious Regression in Econometrics, *Journal of Econometrics*, 1974, vol 2, issue 2
- Jorgenson, D. (1963). Econometric Studies of Investment Behaviour. *Journal of Economic Literature*, vol 9.
- Leahy, J et al (1996). The effects of uncertainty in Investment, *Journal of Money Credit and Banking*, 28, 64-83
- Lensink, (2000). Direct Investment Flows, Volatility and Growth, *www.nottingham.ac.uk papers*
- Ologunde, A., Elumilade, D., Saolu, T., (2006). "Stock market capitalization and interest rate in Nigeria: A time series analysis," *International Research Journal of Finance and Economics*, Issue 4, pp.154-67.
- Uchendu, O.A. (1993). "Interest Rate Policy, Savings and Investment in Nigeria", *Central Bank of Nigeria Economic and Financial Review*, 31(3) : 34-52.
- Uremadu, S. (2006). Real Interest Rate and Savings Mobilization in Nigeria, *www.eajournals.org*