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CLASSICAL THEORY OF INTEREST RATE: THE NIGERIAN EXPERIENCE

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Abstract

The order of causality among savings, interest rate and investment as presented in the classical theory of interest rate has been ignored in empirical studies by previous researchers. In order to fill this gap that exists in literature, this paper establishes the order of causality among savings, interest rate and investment in Nigeria from 1986 to 2017 using vector autoregression (VAR) model. The annual time series data of gross domestic savings, interest rate and gross domestic investment that are obtained from World Bank World Development Indicators are used in the estimation of the model. The results of the impulse response functions and variance decomposition reveal that the order of causality among gross domestic savings, interest rate and gross domestic investment, runs from gross domestic savings to interest rate, interest rate to gross domestic savings, and gross domestic savings to gross domestic investment. There is no unidirectional or bi-directional relationship between interest rate and gross domestic investment. The interest rate should be increased in order to mobilize adequate savings for investment expansion in Nigeria.

Keywords: Gross domestic savings, Interest rate, Gross domestic investment, Secondary Data, Vector autoregression model, Nigeria

INTRODUCTION

The Classical theory of interest rate indicates that investment is a negative function of interest rate. As a result of the believe in the classical theory of interest rate, the quest for low interest rate in order to increase investment has been the main monetary policy target of the central banks in most countries of the world, Nigeria inclusive. There is an inherent problem in the pursuit of low interest rate policy. The low interest rate can discourage households from saving their income because the classical theory of interest rate shows that savings is an increasing function of interest rate. While a low interest rate policy is necessary for investment expansion, it can discourage savings and although investment is a prerequisite for economic growth and development, economic growth and development cannot take place without adequate savings because savings generates investment.

The idea of targeting the interest rate in order to increase investment is not in tandem with the business decision to invest. According to Keynes (1936), the interest rate is not an important factor to consider in the business decision to invest. Investment is mainly influenced by profit expectation and the risk associated with investment rather than interest rate. Investors are willing to under-take investment if they expect high return on investment even if the interest rate is very high. The investors will not be tempted to under-take investment if the risk associated with the investment is very high even if the interest rate is very low. The final demand, existing stock of capital and availability of new technology also play a role in the business decision to invest.

The classical theory of interest rate indicates that the order of causality among savings, interest rate and investment, runs from savings to interest rate, interest rate to savings and investment; and investment to interest rate. The previous empirical studies on savings, interest rate and investment focus only on the effect of interest rate on savings or the effect of interest rate on investment or both. The classical theory of interest rate is not only about the effect of interest rate on savings and investment. It consists of the effect of interest rate on savings and investment and much more importantly, the order of causality among savings, interest rate and investment. This more important aspect of the classical theory of interest rate has been ignored in previous empirical studies.

In view of the above statement of the problem, this study is guided by the following research question. What is the order of causality among savings, interest rate and investment in Nigeria? The main objective of this paper is to establish the order of causality among savings, interest rate and investment in Nigeria. This paper consists of five sections. The next section is literature review. Section 3 presents the methodology. The results are discussed in section 4 and conclusions are drawn in section 5.

LITERATURE REVIEW

We review in this section the classical theory of interest rate as presented by Amacher and Ulbrich, 1986 and Jhingan, 2003. In the classical view, the supply of credit (loanable funds) results from people's decision to save, while the demand for credit results from the desire by businesses to borrow for investment purposes.

The supply schedule has a positive slope to indicate that saving is directly related to the interest rate. This is based on the argument that people forgo spending (save) only if there is an incentive to do so. The interest rate is the incentive for saving. That is, by saving now, individuals can earn interest and accumulate larger sums of money to spend in the future. When the interest rate rises, the incentive to save increases and so the quantity of saving increases. When the interest rate declines, the incentive to save declines and so the quantity of saving declines.

The demand schedule has a familiar negative slope which indicates that investment spending will increase when the interest rate declines and decrease when the interest rate rises. This is because the interest rate is the price businesses pay to obtain credit. When the price is lower, businesses will demand more credit for investment; when the price is higher, they will demand less credit for investment.

According to classical economists, the credit market would establish an equilibrium interest rate which would equate the amount of saving and investment spending. This interest rate is determined by the intersection of the saving and investment schedules. At interest rates above equilibrium, the supply exceeds the demand for credit, and the surplus of saving relative to investment spending forces the interest rate downward to equilibrium interest rate. At interest rates below equilibrium, demand exceeds the supply of credit. This shortage causes the interest rate to be bid up to equilibrium interest rate.

Suppose people suddenly became thrifty; that is, the amount of saving increased at each interest rate. In this case, the saving schedule would shift to the right. The new equilibrium interest rate would be below the initial equilibrium interest rate. The increase in saving would, by lowering the price of credit, lead to an increase in the amount of investment spending. According to Jhingan (2003), at the lower rate of interest, people will save less but the demand for investible funds will increase which tend to raise the rate of interest to the equilibrium level of interest rate.

Many empirical studies on interest rate and savings conclude that interest rate has a positive impact on savings. Gylfason (1981) examines interest rates, inflation, and the aggregate consumption function in U. S. economy using econometric model. The quarterly time series data from the bank of the Federal Reserve Board-MIT-University of Pennsylvania is used

in the estimation of the model. The estimation involves separately introducing in the estimating equation nominal interest rates and the expected rate of inflation, both of which were statistically significant at the 1 percent level. The estimate of interest elasticity of savings is found to be 0.3.

Aizenman, Cheung and Ito (2017) examine the interest rate effect on private savings using data of 135 countries from 1995 to 2014. Among developing countries, when the nominal interest rate is not too low, they detect the substitution effect of the real interest rate on private saving. Among industrial and emerging economies, the substitution effect is detected only when the nominal interest rate is lower than 2.5%. In contrast, emerging-market Asian countries are found to have the income effect when the nominal interest rate is below 2.5%. When they examine the interactive effects between the real interest rate and the variables for economic conditions and policies, they find that the real interest rate has a negative impact—i.e., income effect—on private saving if any output volatility, old dependency, or financial development is above a certain threshold. When the real interest rate is below 1.5%, greater output volatility would lead to higher private saving in developing countries.

Ostry and Reinhart (1995) measure the interest rate sensitivity of household savings in developing countries with different income levels. They utilize the inter-temporal Elasticity of Substitution (IES) in consumption to measure the interest rate sensitivity of household savings. The result suggests that a 1% point rise in real interest rate elicits a rise in savings of only two-tenths of percentage point for the poorest countries in the sample. In contrast, the rise in the savings rate in response to a similar change in the real interest rate is about two- thirds of a percentage point for the wealthiest countries studied. They conclude that the hypothesis that the savings rate and its sensitivity to interest rate changes is a rising function of income finds considerable empirical support.

Kendall (2000) analyzes interest rates, savings and economic growth in Guyana using two Stage Least Squares (2SLS) method and other techniques of econometric analysis. The researcher tests the McKinnon-Shaw hypothesis that the rise in the expected real deposit interest rate leads to an increase in savings-income ratio. The study uses five explanatory variables and the ratio of gross domestic savings to gross domestic product as the dependent variable. It is found that interest rate has significant positive impact savings-income ratio and this finding is in support of the McKinnon-Shaw hypothesis.

Khan et al. (2014) determine the relationship between interest rate and household savings in Pakistan from 1981 to 2011 using Johansen co-integration test and Error Correction Model. The results of co-integration test show that there is a long run relationship among per capita income, inflation, interest rate and household savings. The coefficient of ECM is statistically significant indicating that the model would converge towards equilibrium within the

short period. The result is as per economic theory. Interest rate is found to be positively related to household savings in Pakistan.

Raza et al. (2017) examine the effects of interest rate on savings and deposits in Pakistan from 2002 to 2016 using Ordinary Least Square (OLS) regression method. Savings and deposits are dependent variables in two different models and deposit interest rate is the explanatory variable. The results show that interest rate has significant negative impact on savings and deposits are positively affected by interest rate.

Mwega et al. (1990) examine the real interest rate and the mobilization of private savings in Africa with particular reference to Kenya. Their finding does not support the McKinnon-Shaw hypothesis that the rise in the expected real deposit interest rate leads to an increase in savings-income ratio. They found that interest rate has insignificant impact on private savings in Africa.

Soyibo and Adekanye (1992) use five models in their study of financial system regulation, deregulation and savings mobilization in Nigeria. While private savings is the dependent variable in equation (1), foreign saving ratio, rate of growth of income, real per capita income, adjusted ex ante interest rate and lagged savings ratio are the explanatory variables. The regression results show that all the variables except the lagged savings ratio are not significant, including the adjusted ex ante real interest rate. The implication of their findings is that a change in ex ante real interest rate does not exert any significant impact on private savings. They also test the applicability of McKinnon and Shaw's models of financial intermediation in Nigeria. Their findings indicate that financial liberalization in Nigeria is supported very weakly by the data in Nigeria.

Nwachukwu and Odigie (2009) investigate the factors that drive private savings in Nigeria. They use co-integration test and Error Correction Model (ECM) in their investigation. The results of their investigation show that growth in income and real interest rate have significant positive impact on private savings implying that it is income and interest rate that drive private savings in Nigeria.

Simon-Oke and Jolaosho (2013) evaluate the impact of real interest rate on savings in Nigeria from 1980 to 2008 using Vector Autoregression (VAR) model. The study reveals that the real interest rate has negative impact on savings in Nigeria. This finding is not in conformity to the classical theory of interest rate.

Udude (2015) analyzes the impact of interest rate on savings in Nigeria from 1981-2013 using Vector Autoregression (VAR) model. The researcher also investigates the joint influence of interest rate and income on total savings in Nigeria. The result shows that 1% increase in a period lag of interest rate on deposit, on the average will cause 0.1% increase in savings. It is

found that 1% increase in a year period lag of the income will cause 0.04% increase in savings. It is found that interest rate has insignificant impact on savings while income is statistically significant.

Many empirical studies on interest rate and investment conclude that interest rate has a significant negative impact on investment. Mohsen and Rezazadeh (2011) analyze the non-linear relationship between real interest rate and private investment in developing countries based on dynamic threshold panel. They find a negative relationship between private investment and the real interest rate beyond the threshold level of 5 to 6 %, but the impact of real rates on private investment turns positive within this threshold level. Greene and Villanueva (1990) investigate the determinants of private investment in less developed countries from 1975 to 1985. They conclude that interest rate has a negative impact on investment. Hyder and Ahmed (2003) investigate the reasons for the collapse of private investment in Pakistan and suggest ways to restore it. It is found that an increase in interest rate will lead to a decrease in private investment. Salahuddin et al. (2009) investigate the determinants of investment for 21 developing Muslim countries from 1970 to 2002 using the fixed effect model. They find that interest rate has insignificant impact on investment. They also find that debt servicing has a negative impact on investment while all other variables, namely, lagged investment, growth rate of real GDP per capita, domestic saving, institutional development, and trade openness, have a positive impact on investment. Although private sector credit and aid from foreign countries show significant positive impacts on investment, the results are not robust. The results also show that lending rate, inflation, growth in population, and human capital have no impact on investment in developing Muslim countries. Nasir and Khalid (2004) examine the savings and investment behaviors in Pakistan from 1971 to 2003. They find that budget deficit, government investment, interest rate, and return on government investment have an insignificant impact on savings. The current government expenditure, high income, growth in GDP, and increase in remittances have significant impact on savings. They find that public loan and foreign savings have insignificant positive impact on investment while domestic savings and interest rate have significant positive impact on investment. Athukorala (1998) examines savings, interest rates and investment in India. It is found that an increase in interest rate leads to an increase in savings and investment. Expectations and uncertainties are also found as important determinants of investment. For instance, an increase in the prices of materials and energy has negative effect on investment. Acha and Acha (2011) examine interest rates in Nigeria using regression analysis. They find that deposit rates and lending rates have no influence on savings and investment.

From previous empirical studies, we observe that there is a gap in literature that needs to be filled. The previous empirical studies on savings, interest rate and investment focus only on the effect of interest rate on savings or the effect of interest rate on investment or both. The classical theory of interest rate is not only about the effect of interest rate on savings and investment. It consists of the effect of interest rate on savings and investment and much more importantly, the order of causality among savings, interest rate and investment. This more important aspect of the classical theory of interest rate has been ignored in previous empirical studies.

The order of causality among savings, interest rate and investment is established in this paper based on the classical theory of interest rate. In other words, the classical theory of interest rate is the theoretical framework of the study. According to the classicists, if households become thrifty, that is, the amount of savings increases at each interest rate, the savings curve would shift from left to the right. This new savings curve intersects with investment curve at a lower level of interest rate. Thus, the new equilibrium interest rate would be below the initial equilibrium point. The increase in savings has led to a reduction of interest rate. At the lower rate of interest, people will save less but the demand for investible funds will increase which tend to raise the rate of interest to the equilibrium level of interest rate. As interest rate rises, savings increases. The order of causality among savings, interest rate and investment according to the classicists, run from savings to interest rate, interest rate to savings and investment; and investment to interest rate.

METHODOLOGY

Model Specification

This paper uses a three variable VAR approach to establish the order of causality among savings, interest rate and investment in Nigeria. The model is summarized in the reduced-form VAR:

$$Y_i = \alpha_o + \sum_{i=1}^{n} \beta_i Y_{t-i} + u_i \qquad \_\_\_(1)$$

Where, Y_t is a 3*1 vector of variables (GDS, INT, GDI); β_i are coefficient matrices of size 3×3 and u_i is the one-step ahead prediction error with variance-covariance matrix Σ , α_o is the intercept, t is time, i is the lag length, GDS is Gross Domestic Savings, INT is interest rate and GDI is Gross Domestic Investment.

The VAR methodology deals with several endogenous variables together. Each endogenous variable is explained by its lagged, or past, values and the lagged values of all other endogenous variables in the model; usually, there are no exogenous variables in the model. Since there are three variables, the VAR technique is employed because it is very useful in dealing with multivariable causality. Forecasting is an important part of economic analysis, for some people probably the most important. Vector Autoregression (VAR) has become quite popular method of forecasting economic variables.

As in any standard VAR model analysis, the way the variables enter the model is extremely important for the interpretation of the results. The most appropriate ordering is: GDS – INT –GDI. The gross domestic savings has great influence on interest rate. The interest rate has great influence on gross domestic investment. So, GDS should come first in the VAR model.

Estimation Method

The VAR model is estimated using e-view 9. The time series properties of the data are analyzed using Augmented Dickey-Fuller (ADF) unit root test of Dickey and Fuller (1979). Test of co-integration is carried out using the Johansen (1988) maximum likelihood procedure. The lag length is determined by the likelihood ratio (LR), final prediction error (FPE), Akaike information criteria (AIC), Schwarz information criteria (SC), and Hannan-Quinn information criteria (HQ). The VAR residual portmanteau tests for autocorrelations are used to verify the assumption of no autocorrelation. The cusum test and VAR residual normality tests are used to verify whether the VAR model satisfy the stability and normality assumptions respectively.

Data

The empirical analysis is conducted using annual data. The time span covered is 1986 to 2017. The choice of 1986 as the base year is due to the fact that the policy of deregulation of Nigerian economy started that year. The choice of 2017 as the terminal year is premised on the fact that the time series data of the variables required for the study are available only up to that year. This study is confined within the period of deregulation in other to take into cognizance the classical view of a capitalist economic system. The data of gross domestic savings, interest rate and gross domestic investment are obtained from World Bank World Development Indicators. All the variables are transformed to logarithms in order to be of the same standard.

RESULTS

Pre-Estimation Tests

The unit root test was conducted using Augmented Dickey-Fuller (ADF) test (Table 1). All the variables are non-stationary at levels because ADF-statistic is less than test critical value in absolute term at 5 percent level and p-value of each variable is greater than 5 percent. All the variables are stationary at first differences because ADF-statistic is greater than test critical value in absolute term at 5 percent level and p-value of each variable is less than 5 percent. The ADF test indicates that the variables are integrated at order one at 5 percent level.

Table 1. Augmented Dickey-Fuller Test

Variables	Levels		First Differences		Order of Integration
	ADF- Statistic	Prob*	ADF- Statistic	Prob*	
LNGDS	-1.2385	0.6431	-5.2322	0.0002	I(1)
LNINT	-1.2378	0.6414	-3.5112	0.0162	I(1)
LNGDI	-0.8430	0.7925	-5.4141	0.0001	I(1)

Test critical values: 1% level -3.7241; 5% level -2.9862; 10% level -2.6326

*Mackinnon (1996) one sided p-values

The co-integration test was conducted using Johansen test for co-integration vectors (Table 2). The trace statistic is greater than 0.05 critical value and p-value is less than 5 percent for none hypothesized number of co-integrating equations. The max-eigen statistic is less than 0.05 critical value and p-value is greater than 5 percent for all hypothesized number of co-integrating equations. The trace test indicates 1 co-integrating equation at 5 percent level and maximum eigenvalue test indicates no co-integration at 5 percent level. The trace test denotes rejection of no co-integration at 5 percent level. We conclude that the variables are co-integrated based on the trace test.

Table 2. Johansen Test for Co-integration Vectors

Hypothesized	Trace			Maximum Eigenvalue		
No. of CE (s)	Trace Statistic	0.05 Critical Value	Prob**	Max-Eigen Statistic	0.05 Critical Value	Prob**
None*	31.1685	29.7971	0.0346	16.8956	21.1316	0.1770
At most 1	14.2729	15.4947	0.0757	13.4636	14.2646	0.0666
At most 2	0.8093	3.8415	0.3683	0.8093	3.8415	0.3683

*denotes rejection of the hypothesis at the 0.05 level

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

The lag length selection was done using the VAR lag order selection criteria (Table 3). The Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion and Hannan-Quinn information criterion indicate maximum lag length 1 while sequential modified LR test statistic (LR) indicates maximum lag length 2 at 5 percent level. Since the value of FPE (0.0005) at lag 1 is the smallest out of the values indicated by these five criteria, the VAR model is estimated at a maximum lag length 1 based on Final prediction error (FPE).

Table 3. VAR Lag Order Selection Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	0.0292	4.9812	5.1214	5.0261
1	122.7723	0.0005*	0.8592*	1.4197*	1.0385*
2	1.8408*	0.0008	1.3792	2.3600	1.6930

*Indicates lag order selected by the criterion

Post-Estimation Tests

The results of the VAR residual portmanteau tests for autocorrelations are presented in table 4. The computed Q-statistic at lag 3 and 9 degrees of freedom is 15.2222. The critical value of Q at 5 percent level of significance and at 9 degrees of freedom is 4.756. The computed Q-statistic is greater than the critical Q-statistic at 5 percent level of significance and at 9 degrees of freedom. Therefore, we accept the null hypothesis that there is no residual autocorrelations up to the specified number of lags.

Table 4. VAR Residual Portmanteau Tests for Autocorrelations

Lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	Df
1	0.4953	NA*	0.5123	NA*	NA*
2	8.2323	NA*	8.8021	NA*	NA*
3	15.2222	0.0850	16.5686	0.0559	9

*The test is valid only for lags larger than the VAR lag order.

df is degrees of freedom for (approximate) chi-square distribution.

Figure 1 presents the cusum for stability test. The cusum is used to verify whether the VAR model is stable. The VAR model is stable if the cusum lies within 5 percent critical bound dotted lines. As we can see in Figure 1, the cusum lies within 5 percent critical bound dotted lines. The cusum indicates that the VAR model is stable at 5 percent level of significance.

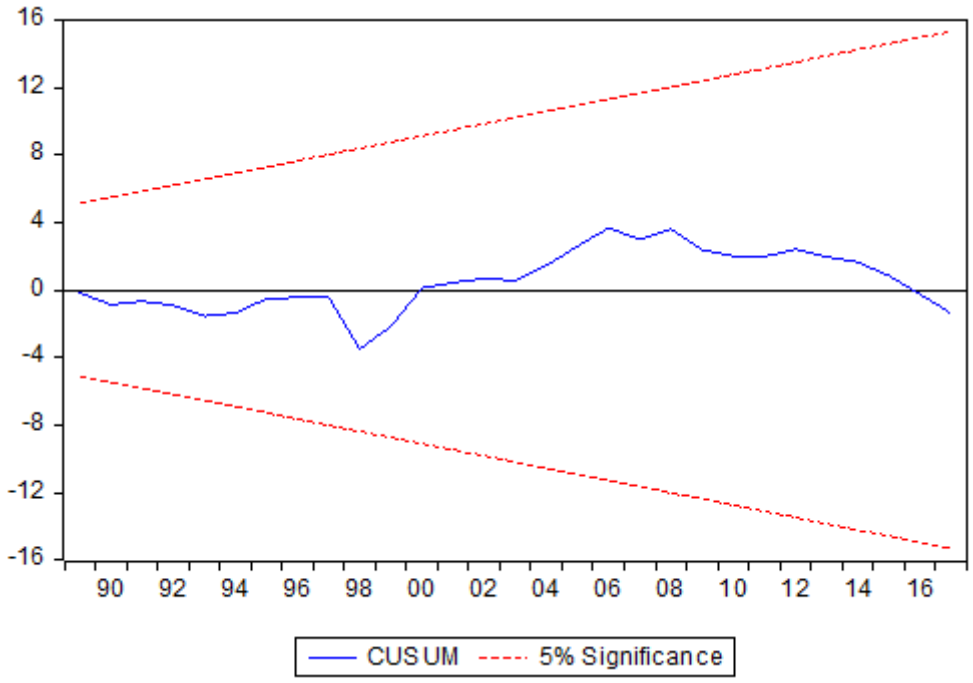

Figure 1. Cusum Test

The results of the VAR residual normality tests are shown in table 5. Instead of going for any rule of thumb for the acceptable ranges of skewness and kurtosis for normal distribution of data, we check Jarque-Bera test. This is because Jarque-Bera test is based on skewness and Kurtosis and so the acceptance of the null hypothesis in this test means that skewness and kurtosis are within the acceptable ranges for normality, and the rejection of the null hypothesis in this test means that skewness and kurtosis are not in acceptable ranges for normality of the data. The Jarque-Bera (JB) statistic is 68.9629 and the computed p-value is zero percent. The computed p-value of JB statistic is too low which indicates that the value of the JB statistic is very different from zero. Therefore, we reject the null hypothesis that the residuals are multivariate normal.

Table 5. VAR Residual Normality Tests

Component	Jarque-Bera	Df	Prof.
1	48.3587	2	0.0000
2	3.9913	2	0.1359
3	16.6129	2	0.0002
Joint	68.9629	6	0.0000

Impulse Response Analysis

Figure 2 (a) presents the response of interest rate (INT) to gross domestic savings (GDS). The response of INT to GDS ranges from -0.0131 to 0.0031 during the period under investigation. On average, the response of INT to GDS is -0.0077. The response of INT to GDS is negative. The GDS has insignificant negative impact on INT. Sims (1987) suggests that for impulse responses, significance can be crudely gauged by the degree to which the functions are bounded away from zero. This result conforms to the classical theory of interest rate because according to the classicists, when savings increases and the demand for investible funds is constant, interest rate falls.

Figure 2 (b) shows the response of GDS to INT. The response of GDS to INT ranges from zero to 0.0728 during the reviewed period. On average, the response of GDS to INT is 0.0364. The response of GDS to INT is positive. This result is line with the classical theory of interest rate because the classical economists believe that interest rate is an incentive to save and so the higher the interest rate, the higher the savings. However, the result indicates that INT has insignificant positive impact on GDS in Nigeria.

Figure 2 (c) reveals the response of gross domestic investment (GDI) to INT. The response of GDI to INT ranges from 0.0311 to 0.0548 during the period under review. On average, the response of GDI to INT is 0.0369. The response of GDI to INT is positive. The INT has an insignificant positive impact on GDI. This result does not tally with the classical theory of interest rate because the classicists believe that interest rate is the cost of capital and so the lower the interest rate, the higher the investment. This result is in support of the Keynesian view that interest rate is not an important factor to be considered in the business decision to invest.

Figure 2 (d) presents the response of INT to GDI. The response of INT to GDI ranges from -0.0189 to zero during the period of study. On average, the response of INT to GDI is -0.0099. The response of INT to GDI is negative. The GDI has an insignificant negative impact on INT. This result is not in support of the classical theory of interest rate because according to the classical economists, when the demand for investible funds increases and the savings schedule is constant, the interest rate rises. The result goes contrary to the classical theory of interest rate because the interest rate cannot rise above the maximum interest rate that is legislated by law.

Figure 2 (e) shows the response of GDI to GDS. The response of GDI to GDS ranges from 0.1416 to 0.2019 during the period under investigation. On average, the response of GDI to GDS is 0.1725. The response of GDI to GDS is positive. This result shows that GDS has

significant positive impact on GDI. The finding confirms the classical proposition that no matter what amount of income is save, it would be exactly offset by investment spending by businesses.

The impulse response analysis shows that the order of causality among savings, interest rate and investment in Nigeria, runs from savings to interest rate, interest rate to savings, and savings to investment. This finding indicates that when people suddenly become thrifty and increases their savings at each level of interest rate, the savings schedule will shift outward to the right and given that the demand for investible funds is constant, the interest rate falls. When interest rate falls, savings decreases and this implies that when interest rate rises, savings increases. An increase in savings leads to an increase in investment. So, interest rate should be increased in order to mobilize adequate savings for investment.

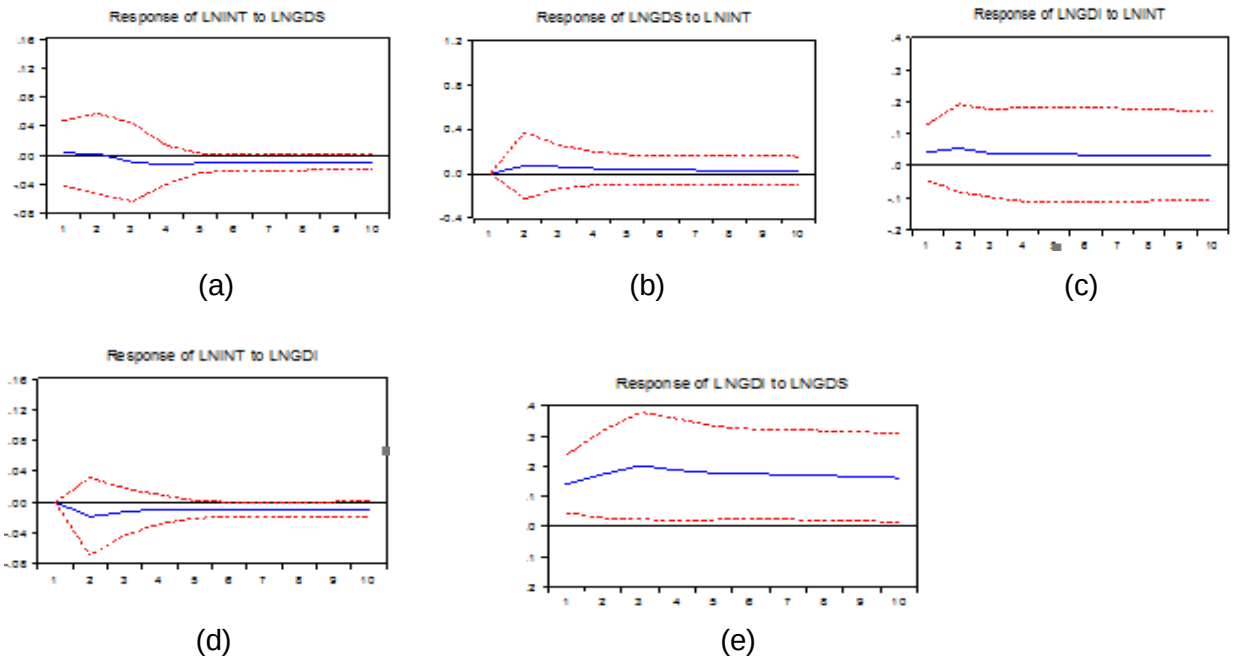

Figure 2. Response to Cholesky One S. D. Innovations ±2 S. E

Variance Decomposition

Figure 3 (a) presents the variance decomposition of interest rate (INT) to gross domestic savings (GDS). The variance decomposition of INT to GDS increases continuously from 0.0651 percent in the first period to 4.2514 percent in the tenth period. On average, the variance decomposition of INT to GDS is 2.1241 percent. This result indicates that GDS has an

insignificant negative impact on INT. Runkle (1987) suggests a probability range above 10 percent for significance in variance decomposition. This finding shows that GDS contributes 2.1241 percent to variation of INT during the period under review.

Figure 3 (b) shows the variance decomposition of GDS to INT. The variance decomposition of GDS to INT increases continuously from zero percent in the first period to 1.7918 percent in the tenth period. On average, the variance decomposition of GDS to INT is 1.4784 percent. This result shows that INT has an insignificant positive impact on GDS in Nigeria. This finding implies that INT contributes 1.4784 percent to variation of GDS during the period under review.

Figure 3 (c) reveals the variance decomposition of gross domestic investment (GDI) to INT. The variance decomposition of GDI to INT increases from 2.2783 percent in the first period to 3.1821 percent in the second period and thereafter decreases continuously to 2.2310 percent in the tenth period. On average, the variance decomposition of GDI to INT is 2.4894 percent. This result indicates that INT contributes 2.4894 percent to variation of GDI during the period under investigation. Apart from the fact that the response of GDI to INT does not tally with the classical theory of interest rate, the variance decomposition indicates that INT has insignificant impact on GDI.

Figure 3 (d) presents the variance decomposition of INT to GDI. The variance decomposition of INT to GDI increases continuously from zero percent in the first period to5.6275 percent in the tenth period. On average, the variance decomposition of INT to GDI is 3.5917 percent. This result indicates that GDI contributes 3.5917 percent to variation of INT during the period under review. Apart from the fact that the response of INT to GDI does not tally with the classical theory of interest rate, the variance decomposition indicates that GDI has insignificant impact on INT.

Figure 3 (e) shows the variance decomposition of GDI to GDS. The variance decomposition of GDI to GDS increases continuously from 25.4732 percent in the first period to 47.5013 percent in the tenth period. On average, the variance decomposition of GDI to GDS is 42.1046 percent. This result indicates that GDS contributes 42.1046 percent to variation of GDI in Nigeria during the period of study. This result implies that GDS has significant positive impact on GDI, which confirms the classical proposition that whatever amount of income that is saved, would be channeled into investment.

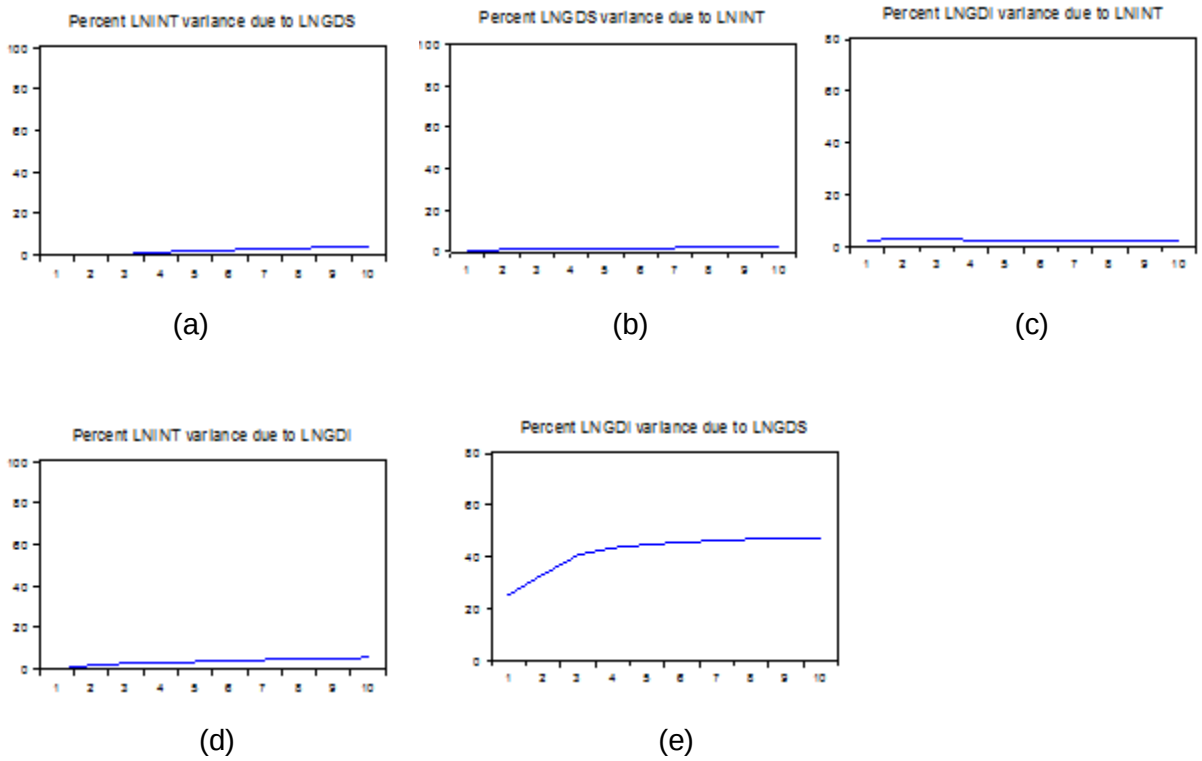

Figure 3. Variance Decomposition

CONCLUSIONS

There is no unidirectional or bi-directional relationship between interest rate and gross domestic investment. Therefore, the pursuit of low interest rate policy by the Central Bank of Nigeria in order to increase investment does not tally with the evidence. The interest rate, an incentive for savings, has a positive effect on gross domestic savings. The gross domestic savings has significant positive impact on gross domestic investment. The order of causality among gross domestic savings, interest rate and gross domestic investment, runs from gross domestic savings to interest rate, interest rate to gross domestic savings, and gross domestic savings to gross domestic investment. The interest rate should be increased in order to mobilize adequate savings for investment. This implies that savings increases as interest rate rises and investment increases as savings increases. The notion that interest rate has great influence on investment and the formulation of monetary policy based on this believe are the main sources of macroeconomic problems in Nigeria. This study suggests that the Central Bank of Nigeria have to do away with such believe. If still in doubt, the Central Bank of Nigeria should conduct a confirmatory study on the impact of interest rate on investment in Nigeria.

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