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Determinants of Domestic Investment in Nigeria: An Autoregressive Distributive Lag Approach

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Abstract
This study examined the determinants of domestic investment in Nigeria for the period 1983 to 2015. The study specifically examined the effect of government expenditure, interest rate spread, growth rate of the economy, inflation rate, exchange rate and credit to the private sector on domestic investment in Nigeria. The ex-post facto research design was adopted to collect the required data. The data were analysed using the ARDL technique. The result of the analyses showed that government expenditure, interest rate spread, growth rate of the economy, inflation rate, exchange rate and credit to the private sector has no long run causality with domestic investment in Nigeria. Also, only government expenditure has short run causality with domestic investment in Nigeria. Based on these findings, the study recommends government expenditure should be focused on viable long term capital projects such as infrastructure and social amenities to sustain its short term causality and establish long run causality on domestic investment. Also, the regulatory bodies of the Nigerian financial sector should bridge the wide spread between deposit and lending rates to reduce the cost of borrowing in a way to promote domestic investment.
Keywords: Exchange rate, Investment, Inflation, Government expenditure, Credit to the private sector, Interest rate spread, Economic growth rate

INTRODUCTION

The single most important element of any economy that drives growth and trigger development is investment. This is because of its ability to promote productive activities, create employment opportunities, enhance output growth and increase the income and earnings of the masses. Investment could be conceived as an outlay of financial, material and/or human resources with the view to realizing benefits over a reasonably period of time. It is any economic activity engaged upon by individuals, groups or governments primarily to earn a risk premium (returns) overtime (Duruechi & Ojiegbe, 2015). This risk premium is a compensation for parting with current consumption and assuming the inherent risk of loss of the initial outlay.

From the above definition, two broad forms of investment exists, they include, capital (real) and financial investment. According to Ahuja (2012), capital investment refers to the expenditure incurred on additional capital goods such as plant, machines, trucks, new factories and so on that creates income and employment. It involves the addition to the stock of physical capital that raises the level of aggregate demand which in turns enhances the level of income and employment in a country (Ojong, Arikpo & Ogar 2015). This definition suggests that real investment is a relevant element that is required in any economy to trigger output growth. In other words, the ability and capacity to increase output of quality service and tangible goods, is dependent on the level of capital investment growth. Financial investment on the other hand refers to investment in securities such as shares, bonds, financial instruments which are also referred to as "IOUs", documents of claims economic agent have on others.

Investment is a vital element of any economy that can trigger growth in savings, employment, and productivity and promote economic stability. According to Ojong, Arikpo & Ogar (2015), investment creates employment, enables knowledge and skills transfer in the area of management and technology; facilitates local firms' access to international markets and finance and enhances international trade integration. Furthermore, investment promotes human capital development; provides avenues for risk and product diversification; encourages favourable competition among businesses and increases product diversity. Investment broadly speaking is a key element that influences and is and is influence by other macroeconomic variables such as exchange rate, interest rate, money supply, the growth rate of GDP, money supply, credit to the private sector and the broad policy of government.

The understanding that investment influences and is being influenced by many macroeconomic factors have given rise to several policy action by many governments the world over. In Nigeria for instance, the structural adjustment programme of 1986 and it privatization exercise, the industrial policy of 1989 which welcomed foreign investors to the industrial sector, the deregulation of the economy, the provision of tax relief and other incentives to investors and owners of equity in all industries, the signing of bilateral investment treaties and double taxation agreements, the promulgation and subsequent adoption of the Export Processing Zone Decree of 1991and the establishment of the Nigerian Investment Promotion Commission (NIPC) through decree 16 of 1995 were all geared towards promoting an enabling investment climate through the manipulation of other indices that have direct effect on investment. In view of all this policies, Johnson (2002) wrote that successive governments have implemented policies and strategies to raise the level of investment but these policies so far have been erratic due

majorly to the lack of knowledge of the determinants of investment (Ajaikaiye 2002). This is why this study is timely and important to identify the major determinants of investment in Nigeria.

OBJECTIVES OF THE STUDY

The major objective of this study is to examine the determinant of investment in Nigeria. The specific objectives include:

(i) To assess whether or not there is a long run causality running from government expenditure, interest rate spread, growth rate of the economy, inflation rate, exchange rate and credit to the private sector to domestic investment in Nigeria;

(ii) To examine whether or not there is a short run causality running from government expenditure, interest rate spread, growth rate of the economy, inflation rate, exchange rate and credit to the private sector to domestic investment in Nigeria

This study is divided into five sections, section one is the introduction, which has been considered. Section two will cover theoretical framework and literature review. Section three is the methodology of the study and will consider the study's design, sources of data, estimation techniques and model specification. Section four will capture data analyses, hypotheses testing and discussion of finding. Section five will summarise the major findings and make relevant policy recommendations.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

THEORETICAL FRAMEWORK

The IS LM Framework

The IS-LM (Investment Saving – Liquidity Preference Money Supply) model is a macroeconomic model that graphically represents two intersecting curves. It was propounded by Samuelson (1947) in an attempt to synthesize the classical and Keynesian theory. It is otherwise called the general equilibrium theory. The investment/saving (IS) curve is a variation of the income-expenditure model incorporating market interest rates (demand), while the liquidity preference/money supply equilibrium (LM) curve represents the amount of money available for investing (supply).

The model explains the decisions made by investors when it comes to investments with the amount of money available and the interest they will receive. Equilibrium is achieved when the amount invested equals the amount available to invest (Warren & Ben-Zion 2000).

The IS-LM model describes the aggregate demand of the economy using the relationship between output and interest rates. In a closed economy, in the goods market, a rise in interest rate reduces aggregate demand, usually investment demand and/or demand for consumer durables. This lowers the level of output and results in equating the quantity demanded with the quantity produced. This condition is equal to the condition that planned investment equals saving. The negative relationship between interest rate and output is known as the IS curve.

The second relationship deals with the money market, where the quantity of money demanded increases with aggregate income and decreases with the interest rate (Frederic, 2009).

THE CLASSICAL THEORY OF INTEREST

This theory was propounded by Marshall (1920) and Pigou (1932). It is known as the demand and supply theory of saving. The theory states that the rate of interest is determined by the supply and demand of capital. The supply of capital is governed by time preference and the demand for capital is determined by the expected productivity of capital. The time and preference are dependent on savings.

The demand for capital consists of the demand for productive and consumptive purpose. Capital is demanded by the investors because it is productive. But the productivity of capital is subject to the law of variable proportions (additional units of capital are not productive as their earlier units).

However, the supply of capital according to Jhingan (2001) depends upon savings rather upon the will to save and the power to save of the community. Some people save irrespective of the rate. They would continue to save even if the rate of interest were zero. There are others who save because the current rate of interest induces them to save and reduce when the rates are low. The higher the rate of interest, the larger the community savings and more will be the supply of funds. The supply curve of capital or the savings curve moves upward to the right.

REVIEW OF EMPIRICAL LITERATURE

There abound numerous empirical studies on the determinants of investment. This section is dedicated to review the methodologies, techniques and findings of some of these studies.

Investigating the determinants of investment, Lesotho (2006) employed the OLS multiple regression technique with variables such as real interest rate and credit to investors. Findings from the study revealed that real interest rate affect investment positively and significantly. Other variable(s) do not affect investment in the short term as they show insignificant co-efficient.

Sajid and Sarfraz (2008) investigated causal relationship between investment and exchange rate. The study used co-integration technique and vector error correction model to examine causality between investment and exchange rate. The result showed that there is long-run as well as a short run equilibrium relationship between them. However, the study was silent on the impact of exchange on investments.

Omoke and Ugwuanyi (2010) tested relationship between inflation, money supply and investment in Nigeria using Johansen Co-integration and Granger Causality test. The results suggest that price stability can contribute towards increased level of investment. The study found that major determinants of investment were monetary aggregates, real output, inflation and exchange rates. This study never considered the role government expenditure plays in the determination of investment level.

Mouyiwa (2005) examined the linkage between inflation rate and investment using panel co-integration approach and a variance decomposition. The result of the study was a negative relationship between inflation rates and investment.

Khat and Bathia (1993) used non-parametric method in his study of the relationship between interest rates and other macro-economic variables, including savings and investment. In his study he grouped (64) Sixty-Four developing countries including Nigeria into three bases on the level of their real interest rate. He then computed economic rate among which were gross savings, income and investment for countries. Applying the Mann - Whitny test, he found that the impact of real interest was not significant for the three groups.

Doornik (1994) explored using conventional regression techniques (OLS) in order to try to identify long-run cointegrating relationships and error correction mechanisms. The general equation includes lagged values of the dependent variable as well as current and lagged values of real GNP, real interest rates, real public investment and the change in the population aged 15 and over. All the variables are in logs except the interest rate and they are all integrated at order of trade flows, external debt, and black market activities also affect the rate of investment in sub-Saharan African economies

Okyay Ucan & Özlem Özturk (2011) investigated whether financial development has contributed to an increase in investment in Turkey. The study modeled investment function including real interest rate, GDP, inflation and Financial determinants which is estimated by utilizing the developments in the time series econometrics covering the period 1970-2009. The VAR approach is used with differencing all I(1) variables to make them stationary. The results mainly indicate a positive relationship between total domestic investment and four indicators.

Ezazul & Begum (2005) explored the sensitivity of investment demand to interest rate in the context of Bangladesh. By using OLS method, a semi log linear investment demand function has been estimated for the sample period of 1973-2004 which found that investment is more sensitive with GDP by 1.61 percent and less sensitive with interest rate (real lending rate) by 0.36 per cent.

Shamim Ahmed & Md. Ezazul Islam (2005) had established an empirical assessment through the unrestricted vector auto-regressions investment spending at the aggregate level is non-responsive to interest rates. The findings claimed that investment spending at the disaggregate level is still not responsive to interest rates except for private sector investment category.

Vinh (2009) studied the effects of institutions and transition progress on investment rates of transition economies since the collapse of the Socialist Bloc. The Panel data estimation techniques are applied and the results show that institutions and transition progress have expected and significant effect on investment rates of transition economies. However, it is the progress in all aspects of economic freedom that matters; just some individual economic freedom measures are significant marginally. Besides, as conditioning variables, growth, saving and financial development (liquid liabilities as % of GDP) are also found to have significant and positive effect on investment in transition economies. The study highlights the indirect effect of institutions on economic growth via investment.

Zobayer, Tabassum and Mohammad (2012) examined the macroec0onomic determinants of investment in Bangladesh from 1981- 2010. The study regressed GDP at constant price, Lending Interest Rate, Inflation and Foreign Exchange Rate against investment. To check whether the series were integrated or not, the study applied the Augmented Dickey Fuller tests and Phillips- Perron test. The Engle-Granger tests and Johansen- Juselius test were used to check whether the series are cointegrated or not. It finds that there is a long-term relationship between them. The study further applied the bivariate and multivariate analysis of the cointegration test. This study drew upon Error Correction Mechanism which states that there exists a stable relationship in Bangladesh in the short-run as well as in the long run.

RESEARCH METHODOLOGY

The study adopts the ex-post facto research design majorly because the variables are of secondary data sources in a manner that the researchers did not collect the data from the field. The data were collected from the CBN statistical bulletin and other relevant secondary data sources like the internet, journal articles, text books, and other government publications.

ESTIMATION TECHNIQUES

We analyzed the properties of the data using the descriptive statistics. As a pre-test condition, we applied the Augmented Dickey Fuller (ADF) unit root test to examine the stationarity of the data set. The ADF model is specified thus:

$$\nabla y_t = y_0 + y_{1t} + (\beta - 1)y_{t-1} + \delta_1 \Delta y_{t-1} + \varepsilon_t \quad \text{..... (1)}$$

Having tested the stationerity of the data set, we found that the data set are integrated at I(1) and I(0). We therefore employed the Autoregressive Distributed Lag (ARDL) bounds test approach to cointegration proposed by Pesaran, Shin and Smith (2001) to estimate the relationship among the variables. The ARDL approach offers some desirable statistical advantages over other co-integration techniques. While other co-integration techniques require all the variables to be integrated of the same order, ARDL test procedure provides valid results whether the variables are I(0) or I(1) or mutually co-integrated and provides very efficient and consistent estimates in small and large sample sizes (Pesaran, Shin & Smith (2001). This approach therefore becomes relevant to this since our unit root test shows that all the series are either I (0) or I (1). The ARDL model can be specified as:

$$\Delta LDINVS = \beta_0 + \sum_{t=i}^{k} \beta_{1i} \Delta LDINVS_{t-i} + \sum_{t=i}^{k} \beta_{2i} \Delta LGE_{t-i} + \sum_{t=i}^{k} \beta_{3i} \Delta INRS_{t-i} + \sum_{t=i}^{k} \beta_{4i} \Delta GDPGR_{t-i} + \sum_{t=i}^{k} \beta_{5i} \Delta INFR_{t-i} + \sum_{t=i}^{k} \beta_{6i} \Delta EXR_{t-i} \sum_{t=i}^{k} \beta_{7i} \Delta LPSC_{t-i} + + \varepsilon_{1t} \text{..... (2)}$$

Where

Δ = the difference operator.

The test involves conducting F-test for joint significance of the coefficients of lagged variables for the purpose of examining the existence of a long-run relationship among the variables. The error correction model for the estimation of the short run relationships is specified as:

$$\Delta LDINVE = \beta_0 + \sum_{t=i}^{k} \beta_{1i} \Delta LDINVS_{t-i} + \sum_{t=i}^{k} \beta_{2i} \Delta LGE_{t-i} + \sum_{t=i}^{k} \beta_{3i} \Delta INRS_{t-i} + \sum_{t=i}^{k} \beta_{4i} \Delta GDPGR_{t-i} + \sum_{t=i}^{k} \beta_{5i} \Delta INFR_{t-i} + \sum_{t=i}^{k} \beta_{6i} \Delta EXR_{t-i} + \sum_{t=i}^{k} \beta_{7i} \Delta LPSC_{t-i} + \lambda_1 ECM_{t-1} + u_{1t} \text{..... (3)}$$

A negative and significant ECM_{t-1} coefficient implies that any short term disequilibrium between the explained and explanatory variables will converge back to the long-run equilibrium relationship.

To validate whether or not the residual are independent, the CUSUM test, the heteroskedasticity test and the histogram normality test were apply. Furthermore, the study applied the Breusch-Godfrey serial correlation LM test to test whether or not the estimates of the model are stable. Lastly, the study applied the Wald test to assess whether or not the independent variable move together both in the long run and short run to influence the dependent variables.

DATA ANALYSES AND DISCUSSION

TABLE 1:
DESCRIPTIVE STATISTICS

	LDINVS	LGE	INRS	GDPGR	INFR	EXR	LPSC
Mean	5.914333	5.252556	11.37467	4.718000	20.50000	83.33867	6.406750
Median	5.705906	5.753015	13.09500	4.650000	12.35000	107.0250	6.455436
Maximum	9.554793	7.049949	20.70000	33.74000	73.10000	193.2700	9.834895
Minimum	2.433613	1.851599	1.000000	-10.75000	5.400000	2.020000	2.854745
Std. Dev.	1.926892	1.634511	5.001894	7.271739	19.24494	64.37951	2.355984
Skewness	-0.130279	-0.801106	-0.637945	1.696310	1.480309	-0.043197	0.031745
Kurtosis	2.015047	2.322841	2.547595	10.30283	3.735305	1.351005	1.610840
Jarque-Bera	1.297529	3.782035	2.290707	81.05150	11.63242	3.408311	2.417246
Probability	0.522691	0.150918	0.318111	0.000000	0.002979	0.181926	0.298608
Sum	177.4300	157.5767	341.2400	141.5400	615.0000	2500.160	192.2025
Sum Sq. Dev.	107.6744	77.47714	725.5493	1533.467	10740.66	120196.9	160.9692
Observations	30	30	30	30	30	30	30

Source: Researchers' Eview 9.1 Computation, 2017

We begin this section by comprehensively examining the properties of the raw data set. Table1 presents the result of the descriptive statistics. From the result, it could be observed that the mean values of LDINVS, LGE, INRS, GDPGR, INFR, EXR and LPSC are respectively 5.9143, 5.2526, 11.3746, 4.7180, 20.500, 83.3386 and 6.4067 with their standard deviations of 1.9268, 1.6345, 5.0018, 7.2717, 19.2449, 64.3795 and 2.3559 ranging respectively from 2.4336 to 9.5547, 1.8515 to 7.0499, 1.0000 to 20.7000, -10.7500 to 33.7400, 5.4000 to 73.1000, 2.0200 to 193.2700 and 2.8547 to 9.8348.

A close examination of the skewness of the data set as shown in table 1 revealed that INRS, EXR, DINVS

and GE were negatively skewed (left skewed distribution), meaning that their means are also to the left of the peak. On the other hand, GDPGR, INFR and PSC were positively skewed (right skewed distribution), meaning that their means are also to the right of the peak. The coefficient of the kurtosis of the variables indicates that INRS, EXR, DINVS, PSC and GE were platykurtic below 3.000000 relative to the normal, meaning that the distribution produces fewer and less extreme outliers than does the normal distribution. GDPGR and INFR were leptokurtic (above 3.000000) relative to the normal meaning that the distribution produces more outliers than the normal distribution.

The JB values of 1.2975, 3.7820, 2.2907, 3.4083 and 2.4172 for LDINVS, LGE, INRS, EXR and PSC respectively with their respective p-values of 52.26 percent, 15.09 percent, 31.81 percent, 18.19 percent and 29.86 percent means that they are normally distributed. However, the JB values of 81.0515 and 11.6324 for GDPGR and INFR with their respective p-values less than 5 percent suggest that they are not normally distributed.

TABLE 2:
AUGMENTED DICKEY FULLER (ADF) UNIT ROOT TEST

Variables	ADF Test Statistics		Order of integration
	Level	1st Difference	
LDINVS	-0.301710	-3.932705	I(1)
LGE	-1.994168	-5.808689	I(1)
INRS	-2.974728		I(0)
GDPGR	-4.414228		I(0)
INFR	-3.948559		I(0)
EXR	-0.075735	-4.885299	1(1)
LPSC	-0.404141	-3.924995	1(1)
Test critical values at level: 1% = -3.679322, 5% = -2.967767, 10% = -2.622989			
Test critical values at 1st Diff: 1% = -3.689194, 5% = -2.971853, 10% = -2.625121			

Source: Researchers' Eview 9.1 Computation, 2017.

Table 2 showed that LDINVS, LGE, EXR and LPSC had unit root at levels but after differencing one time they became stationary. This is so as their test statistics at levels, taking their absolute values were less than their critical values at 5 percent. However, after differencing one time, the test statistics, taking their absolute values became greater than their critical values at 5 percent level. On the other hand, INRS, GDPGR and INFR were stationary at levels as their test statistics; taking absolute values were greater than their critical values. Since the variables are integrated of order I(1) and I(0), we had to estimate our model using the ARDL model. However, we will not do this without determining our lag selection criteria. The AIC is the basis for our lag selection because it is widely adopted, though it is criticised for its inconsistency and irregularity in selecting its optimal lag.

TABLE 3
LAG ORDER SELECTION CRITERIA

Endogenous variables: LDINVS LGE INRS GDPGR INFR EXR LPSC

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-485.8652	NA	4591561.	35.20466	35.53771	35.30647
1	-341.0801	206.8359	5498.500	28.36286	31.02727*	29.17740
2	-259.6172	75.64415*	1155.974*	26.04408*	31.03985	27.57134*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Researchers' Eview 9.1 Computation, 2017.

From table 3 above, using the AIC, lag 2 is the optimal lag for this study. Hence, in estimating the ARDL model, we lagged our variables two times.

TABLE 4:
LONG RUN ARDL COINTEGRATION ANALYSIS

Dependent Variable: D(LDINVS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.088008	1.990948	-1.048750	0.3423
D(LDINVS(-1))	2.166066	0.830682	2.607575	0.0478
D(LDINVS(-2))	1.027755	1.079654	0.951931	0.3848
D(LGE(-1))	-0.344193	0.725194	-0.474622	0.6551
D(LGE(-2))	0.846652	0.519539	1.629622	0.1641
D(INRS(-1))	-0.198897	0.139722	-1.423519	0.2139
D(INRS(-2))	-0.112437	0.069719	-1.612732	0.1677
D(GDPGR(-1))	-0.024597	0.040897	-0.601439	0.5738
D(GDPGR(-2))	-0.011598	0.027105	-0.427892	0.6865
D(INFR(-1))	0.006043	0.006729	0.898081	0.4103
D(INFR(-2))	-0.004406	0.007159	-0.615427	0.5652
D(EXR(-1))	0.011156	0.013513	0.825626	0.4466
D(EXR(-2))	-0.005098	0.009454	-0.539249	0.6129
D(LPSC(-1))	-1.011494	0.655101	-1.544028	0.1832
D(LPSC(-2))	-1.134090	0.705451	-1.607611	0.1688
LDINVS(-1)	-2.665051	1.237639	-2.153334	0.0839
LGE(-1)	0.578195	0.439554	1.315412	0.2455
INRS(-1)	0.192794	0.167497	1.151031	0.3018
GDPGR(-1)	0.021815	0.043847	0.497531	0.6399
INFR(-1)	0.029677	0.017430	1.702669	0.1494
EXR(-1)	-0.021847	0.019868	-1.099624	0.3216
LPSC(-1)	2.139768	1.202011	1.780157	0.1352
R-squared	0.855064			
Adjusted R-squared	0.246335			
F-statistic	1.404671	Durbin-Watson stat		2.600673
Prob(F-statistic)	0.378708			

*Represents significant F-Statistics at 5 percent level

Source: Researchers' Eview 9.1 Computation, 2017.

The above table represents the ARDL long run estimates of the effect of GE, INRS, INFR, EXR, GDPGR, PSC on DINVS. From the result, the R^2 value of 0.8550 show that about 85.50 percent of the changes in the domestic investment is explained by the independent variables (government expenditure, interest rate spread, inflation rate, exchange rate, economics growth rate, and private sector credit) in the long run. Furthermore, the F-Statistics showed that the model is not statistically significant at 5 percent. With this the study proceeds to examine whether the model is free from serial correlation in the long run using the Breusch-Godfrey Serial Correlation LM test. Extract of the result of the Breusch-Godfrey Serial Correlation LM test is presented in the table below:

TABLE 5:
BREUSCH-GODFREY SERIAL CORRELATION LM TEST OF THE LONG RUN ESTIMATES

F-statistic	1.920920	Prob. F(2,3)	0.2904
Obs*R-squared	15.16108	Prob. Chi-Square(2)	0.0005

Source: Researchers' Eview 9.1 Computation, 2017.

Checking the observed R^2 value of 15.1610 with it corresponding prob. Chi-square (2) of 0.0005 percent, we conclude that the model is not free from serial correlation.

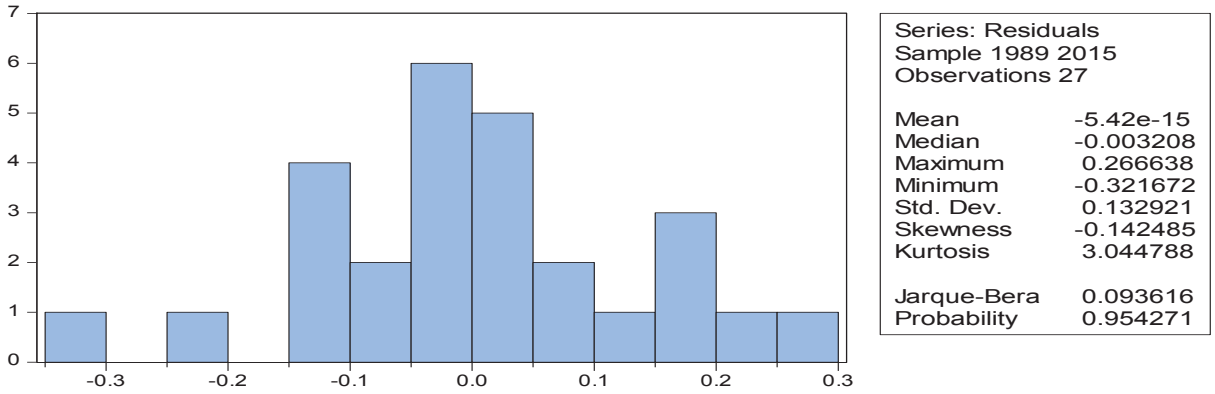
TABLE 6:
HETEROSKEDASTICITY TEST: BRUEUSCH-PAGAN-GODFREY OF THE LONG RUN ESTIMATES

F-statistic	0.583185	Prob. F(21,5)	0.8249
Obs*R-squared	19.17250	Prob. Chi-Square(21)	0.5741
Scaled explained SS	0.672217	Prob. Chi-Square(21)	1.0000

Source: Researchers' Eview 9.1 Computation, 2017.

From the table the observed R^2 value of 19.1725 with it corresponding prob. Chi-square value of 57.41 percent, more than five percent, implies that the model is free from heteroskedasticity.

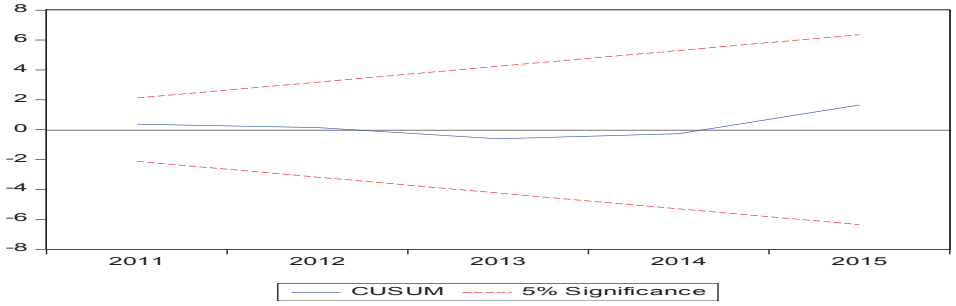
FIGURE 1:
HISTOGRAM NORMALITY TEST OF THE LONG RUN ESTIMATES



Source: Researchers' Eview 9.1 Computation, 2017.

The Jarque Bera statistics of 0.0936 with it corresponding probability of 95.42 percent, more than 5 percent, means that the residual of the long run equation is normally distributed.

FIGURE 2:
STABILITY DIAGNOSTIC USING CUSUM TEST OF THE LONG RUN ESTIMATES



Source: Researchers' Eview 9.1 Computation, 2017.

From the CUSUM Test result, it could be seen that the blue line lies in between the two red lines. This means that the estimates of the long run equation are stable and could be used for inferences.

TABLE 7:
LONG RUN TEST OF THE JOINT SIGNIFICANCE OF THE MODEL USING WALD TEST

Test Statistic	Value	df	Probability
F-statistic	0.987454	(7, 5)	0.5245
Chi-square	6.912181	7	0.4381

Null Hypothesis: C(16)=C(17)=C(18)=C(19)=C(20)=C(21)=
C(22)=0

From the Wald test result extract above, we conclude that there variables have no long run association, meaning that the variables do not move together in the long run. This is so as the F-statistic p-value of 52.45 percent is greater than 5 percent, meaning that we cannot reject the null hypothesis.

TABLE 8:
SHORT RUN ARDL DYNAMICS OF THE MODEL

Dependent Variable: D(LDINVS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.267541	0.132677	2.016477	0.0688
D(LDINVS(-1))	1.131753	0.319022	3.547566	0.0046
D(LDINVS(-2))	-0.270599	0.416254	-0.650081	0.5290
D(LGE(-1))	-0.496875	0.222871	-2.229428	0.0476
D(LGE(-2))	0.739532	0.217159	3.405485	0.0059
D(INRS(-1))	-0.019253	0.016535	-1.164406	0.2689
D(INRS(-2))	-0.026960	0.017057	-1.580574	0.1423
D(GDPGR(-1))	0.003061	0.009006	0.339838	0.7404
D(GDPGR(-2))	0.013831	0.009562	1.446427	0.1759
D(INFR(-1))	0.007417	0.003379	2.194668	0.0506
D(INFR(-2))	-0.001552	0.003237	-0.479529	0.6410
D(EXR(-1))	-0.002719	0.003903	-0.696818	0.5004
D(EXR(-2))	-0.009792	0.004955	-1.975986	0.0738
D(LPSC(-1))	-0.251032	0.330494	-0.759565	0.4635
D(LPSC(-2))	-0.447408	0.349460	-1.280282	0.2268
ECM(-1)	-0.801667	0.397996	-2.516777	0.0286
R-squared	0.780878			
Adjusted R-squared	0.482075			
F-statistic	2.613356	Durbin-Watson stat		1.997974
Prob(F-statistic)	0.046781			

Source: Researchers' Eview 9.1 Computation, 2017.

The above table represents the ARDL short run estimates of the determinants of investment in Nigeria. From the result, the R^2 value of 0.7808 shows that about 78.08 percent of the changes in the domestic investment in the short run is jointly determined by the variations in government expenditure, interest rate spread, economic growth rate, inflation rate, exchange rate, and credit to the private sector up to 78.08 percent. The F-Statistics value of 2.6133 with it corresponding probability of 0.046 showed that the short run equation is significant at 5 percent.

Furthermore, the coefficient of the ECM is negative and significant as theoretically expected. This means that the system is getting adjusted at the speed of 80.16 percent towards long run equilibrium. With this the study proceeds to examine whether the short run model is free from serial correlation using the Breusch-Godfrey Serial Correlation LM test. Extract of the result of the Breusch-Godfrey Serial Correlation LM test is presented in the table below:

TABLE 9:
BREUSCH-GODFREY SERIAL CORRELATION LM TEST OF THE SHORT RUN ESTIMATES

F-statistic	3.595767	Prob. F(2,9)	0.0712
Obs*R-squared	11.99216	Prob. Chi-Square(2)	0.0025

Source: Researchers' Eview 9.1 Computation, 2017.

Checking the observed R^2 value of 11.9921 with it corresponding prob. Chi-square (2) of 0.25 percent, we conclude that the short run equation is not free from serial correlation.

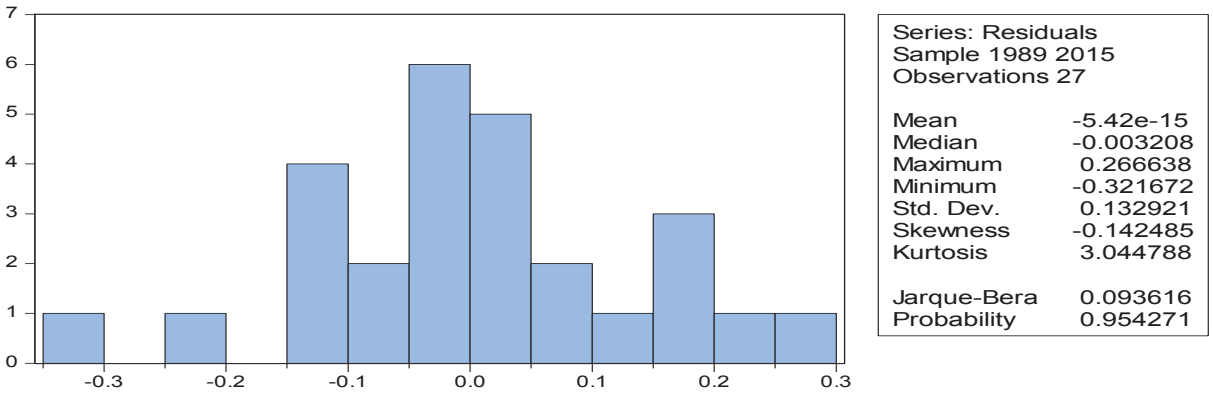
TABLE 10:
HETEROSKEDASTICITY TEST: BRUEUSCH-PAGAN-GODFREY OF THE SHORT RUN ESTIMATES

F-statistic	0.893332	Prob. F(15,11)	0.5897
Obs*R-squared	14.82786	Prob. Chi-Square(15)	0.4639
Scaled explained SS	3.745401	Prob. Chi-Square(15)	0.9985

Source: Researchers' Eview 9.1 Computation, 2017.

From the table the observed R^2 value of 14.8278 with it corresponding prob. Chi-square value of 46.39 percent, more than five percent, implies that the short run equation is free from heteroskedasticity.

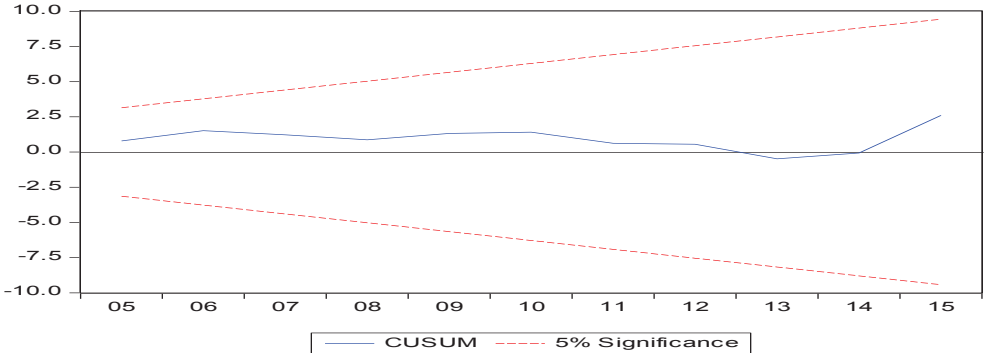
FIGURE 3:
HISTOGRAM NORMALITY TEST OF THE SHORT RUN ESTIMATES



Source: Researchers' Eview 9.1 Computation, 2017.

The Jarque Bera statistics of 0.0936 with it corresponding probability of 95.42 percent, more than 5 percent, means that the residual of the short run equation is normally distributed.

FIGURE 4:
STABILITY DIAGNOSTIC USING CUSUM TEST OF THE SHORT RUN ESTIMATES



Source: Researchers' Eview 9.1 Computation, 2017.

From the CUSUM Test result, it could be seen that the blue line lies in between the two red lines. This means that the estimates of the short run equation are stable and could be used for inferences.

TABLE 11:
ANALYSIS OF THE SHORT RUN CAUSALITY USING WALD TEST

Dependent Variable: GDP (Output)

Variables Tested	Null Hypotheses	F-Stats	Prob.
LGE	C(4)=C(5)=0	8.5125*	0.0058
INRS	C(6)=C(7)=0	1.2766	0.3173
GDPGR	C(8)=C(9)=0	1.4511	0.2759
INFR	C(10)=C(11)=0	2.4263	0.1340
EXR	C(12)=C(13)=0	2.2945	0.1469
PSC	C(14)=C(15)=0	1.1770	0.3082

*Represents rejection of null hypotheses at 5 percent level

Source: Researchers' Eview 9.1 Computation, 2017.

Table 11 only rejected the null hypotheses for government expenditure, meaning that there is a short run causality running from government expenditure to domestic investment. In other words, government expenditure triggers short term investment in Nigeria.

SUMMARY OF FINDINGS

The following major findings were made from our analyses:

(i) There is no long run causality running from government expenditure, interest rate spread, growth rate of the economy, inflation rate, exchange rate and credit to the private sector to domestic investment in Nigeria;

(ii) There is no short run causality running from interest rate spread, growth rate of the economy, inflation rate, exchange rate and credit to the private sector to domestic investment in Nigeria;

(iii) Government expenditure has short run causality with domestic investment in Nigeria.

CONCLUSION AND POLICY RECOMENDATIONS

This study examined the determinants of domestic investment in Nigeria using the Autoregressive distributive lag methodology. Based on the above findings, the study draws the concludes that the domestic investment in Nigeria has not been significantly influenced by government expenditure, interest rate spread, growth rate of the economy, inflation rate, exchange rate and credit to the private sector to domestic investment in Nigeria. Also, in the short run, only government expenditure triggers domestic investment. Hence, the following recommendations:

(i) Government expenditure should be focused on viable long term capital projects such as infrastructure and social amenities to sustain its short term causality and establish long run causality on domestic investment.

(ii) The regulatory bodies of the Nigerian financial sector should bridge the wide spread between deposit and lending rates to reduce the cost of borrowing in a way to promote domestic investment.

(iii) The continuous depreciation of naira should be checked by the appropriate authorities; government should discourage importation of commodities that can be produce locally and pool resources into the production of such commodities or support the private sector to do so

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