AN EMPIRICAL ANALYSIS OF EFFECTS OF FOREIGN DIRECT INVESTMENT, EXCHANGE RATE AND ENERGY INFRASTRUCTURE ON DOMESTIC INVESTMENT IN NIGERIA

Ahmed O. ADEKUNLE*

Bello I. ABDULLAHI**

Adedeji D. GBADEBO***

Segun K. FAKUNMOJU****

**Department of Economics and Financial Studies, Summit University, Offa, Nigeria.*
***Department of Finance, University of Ilorin, Nigeria.*
****Department of Economics, Freiburg University, Germany*
*****Department of Finance, Kwara State University, Nigeria.*

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Abstract

Domestic investment is a significant component of economic activities affecting Nigerian economy for decades. Sequel to this, this paper examines the effect of Foreign Direct Investment (FDI), exchange rate and energy infrastructure on domestic investment in Nigeria. Time series data obtained from Central Bank of Nigeria (CBN) Statistical Bulletin and World Development Indicator were employed using Autoregressive Distributive Lag (ARDL) Model. Empirical findings show that FDI has positive and significant effect on domestic investment while exchange rate and energy infrastructure have a positive effect on domestic investment but non significant. The policy implications of this finding is that government should adopt more stringent supervision on exchange rate, and policy to regulate execution of energy infrastructure project; and more funds needed to emancipate energy infrastructure in order to obtain desired level of domestic investment in Nigeria.

Corresponding author:
tobiahamed@gmail.com

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Introduction

The existence of an organized and well-structured economy is critical to the growth of domestic investment in any country. Various policies had been implemented in Nigeria to aid her economy growth and development since she attained her independence in 1960 by regulating the size of domestic investment or indirectly via policies designed at reducing capital flight in the economy. Domestic investment is a tool of unimpeded effective economic system which serves as an important factor that influences economic growth of most economies of the world. This justifies why developing country like Nigeria pursue the goal of growth induced economy with the effect of increasing domestic investment (i.e. think and buy Nigeria product) in order to abate massive capital flight (Osinubi & Akinyele, 2006).

Essentially, Domestic investment is the size of physical investment used in calculating gross domestic product (GDP) of countries economic undertakings (Sims, 1980). This is a pertinent element of GDP because it shows an indicator of the future productive capacity of the economy. Many a policy maker in the developing countries or fourth world has found domestic investment as a major constraint in policy making and implementation. Earlier studies (Ayadi, 2008; Ajayi, 1995; Beja, 2013) indicated that domestic investment has important implications to the economy by increasing potential growth and development of a country.

Present-day analysis in Nigeria displays that investments made locally (domestic investment) have contributed about 54.1% of Nigeria's economic activities by employing about 10 per cent of the labor force, typically from industrial sector of the economy (Federal Research Division, 2008). This shows that the output of domestic investments influence the levels of energy infrastructure as well as growth in foreign direct investment. It has therefore been realized that growth in domestic investment in Nigeria requires growth in exchange rate; energy infrastructure and long lasting foreign investment. One of the major factors hindering the growth of domestic investment is exchange rate uncertainty. Steep exchange rates are barriers to investors because it causes high cost of doing business, thereby, dampening profits and investments. This is so because exchange rate volatility has serious implications for a wide series of products since the exchange rate pass-through on price (Taylor, 2000; Bodnar, Duttas & Marston, 2002).

In theory, changes in exchange rate have two opposite effects on domestic investment (Saheed & Ayodeji, 2012). When domestic currency loose its value, the marginal profits of creating additional unit of money is likely to rise because there will be a rise in revenues from both domestic and foreign sales. This positive effect can be counter-balanced by the rising variable cost and the higher price for imported capital. The total impact of exchange rate movement on domestic investment remains an empirical question (Taylor, 2000).

Essentially, savings which is stimulated by rates of interest on deposit and with the proclivity to enhance the capacity of commercial banks to give loan for viable economic activities has been seriously impaired. For example, Commercial Bank loans and advances for small medium enterprise (SMEs) causing total private sector credit to fall from 27.04% in 1992 to 0.41% in 2011 (CBN, 2011). Onodungo (2014) in their findings confirmed that about 79 per cent of industries surveyed in 2001 identified lack of financial resources as their critical constraint.

The growth and development of any economy is a function of size of domestic investment among others. Essentially, developing country like Nigeria needs adequate power supply to boost small, medium and large scale firms in order to achieve the needed growth and development the country desires (Ogunmuyiwa, Okuneye & Amaefule, 2017). Domestic investment possess huge benefits to Nigerian economy by encouraging economic growth and development as an outcome of large labour force simultaneously with abundant natural resources in the country. However, the epileptic power supply has not yielded the desired results for desired domestic investment that can position the economy to higher economic growth and development. In view of this, the need to establish the effect of foreign direct investment, exchange rate and energy infrastructure on domestic investment in Nigeria becomes vital in order to guide government, as well as indigenous financiers in creating additional domestic investments in stimulating the growth of the economy. This basically served as motivation for the current study.

Literature Review

It is argued that a reduction in the value of a country currency vis-à-vis that of another currency called depreciation of currency. This exchange rate fluctuation holds potential risks for domestic investment. It increases the cost of production for local firms relative to those of their foreign counterparts, especially in import dependent economies (Ayadi, 2008).

The dual or two-gap theory is based on the Harrod-Domar equation in which capital accumulation (the rate of investment) is the only determinant of growth (Bauer, 1991). Specifically, the Harrod-Domar equation can be written to give the investment required to attain a particular growth rate. If domestic savings are less than this amount, there is a savings gap, which may be filled by foreign savings (capital inflows in form of FDI).

The two gaps of the two-gap model were used separately during the 1950s in exercises to estimate requirements for foreign inflows and were first combined by Hollis Chenery and Michael Bruno for an analysis of Israel. More famously, Chenery and Strout (1953) applied the model to an aid-requirements exercise for United State Agency for International Development (USAID). A number of other papers followed in a similar vein, though a later review by the Development Assistance Committee (DAC) concluded that these exercises had had little impact on either the level or allocation of aid. However, the Revised Minimum

Standards Model (RMSM) of the World Bank owes something to the two-gap model and is still used to forecast foreign-exchange requirements.

Capital goods, most of which have to be imported, so that the level of imports necessary to sustain growth may be calculated. If export earnings are less than this amount, there is a trade gap. The binding constraint is the larger of the two gaps and foreign inflows must be sufficient to fill this larger gap if the desired growth rate is to be attained (Eldar, 2005).

This study is based on the dual gap analysis a theory in economics that establishes a link between investment output, FDI (capital inflow) and foreign exchange. The theory demonstrates how foreign capital inflows raise the recipient's growth rate by supplementing either investment to raise domestic investment (Tilling the investment gap) or export earnings to increase imports (tilling the trade gap or foreign exchange gap). The main purpose of gap theory has been to calculate the capital inflow required to attain a particular growth in domestic investment rate, though the model also underlies much analysis of aid's macro-economic impact (Djankov, Jose & Reynal- Querol, 2005).

The current study is, therefore, built on the dual gap theory particularly dual analysis of investment which will validate the empirical claims of the study. Similarly, the activities of firms and industries operating in an economy are influenced by the level of energy infrastructure such that the general behavior of a firm is a reflection of the signal from the domestic investment

Investigating the determinants of investment, Lesotho (2006) in Italy employed the ordinary least square multiple regression technique with variables such as real interest rate and credit to financiers. Outcomes from the study shown that actual interest rate moves investment upwardly and ominously. Other elements do not impact investment in the short run as they display inconsequential outcome.

Sajid and Sarfraz (2008) studied connection between exchange rate and investment. The study employed co-integration technique and Vector Error Correction Model (VECM) to scrutinize causation between investment and exchange rate. The outcome displayed that there is short-run as well as long run steadiness connection between them. However, the study was mute on the influence of exchange rate on investments.

Balassa (1988), Bljer and Khan (2013), Duncan (1999), Greene and Villanueva (1991), Jayaraman (1996), Khan & Kumar (1997), Paresh & Russell (2011), Skare and Sinkovic (2013), Sneessens (1987), Spiegel (2012), Stevens (2003), Stiglitz (2011), Summers (2000), Skully (1997) and Weder (1998) carried out stochastic investigations on the causes manipulating private investment. Earlier studies showed that private investment tendencies are primarily influenced by the profit motive plus other factors such as wage rate, real exchange rate policies, and raw material costs, rate of inflation and appropriate pricing of capital, labor and land.

Ghazali (2010) examines the causality between private domestic investment and economic growth (GDP) in Pakistan over the period 1981 to 2008. The study reveals the following: that increased economic growth encourages large private domestic investment; there is a bi-directional causality between local private investment and growth in the economy vice versa. The co-integration outcomes from the study display that there is a long-run connection between local private investment and economic growth. It is obvious that local private investment in Pakistan economy spurs economic growth.

Tan and Tang (2011) observed the connection between local private investment (LPI), the cost of capital and economic growth in Malaysia over the period of 1970 to 2009. The practical outcome displays that LPI, the user cost of capital, and economic growth are co-integrated in Malaysia. The causation test discloses that there is a unidirectional causation exists between LPI and economic growth and from LPI to the user cost of capital in the long run. Greene and Villannera (1991) performed an empirical research on 23 countries and discovered that public investment on infrastructures complements private investment. Though, it should be noted that there is a limit for domestic savings, in some cases, public investment would cause a critical restriction of private investment and therefore horde out local private investment.

On the other hand, Hatano (2010), estimating an error correction model, confirms the crowding-in effect of public investment on private investment whereas Balassa (1988) in his research of 30 countries illustrated that there is an inverse relationship between private investment and public investment. Munnell (1990) utilized estimates of both gross state product and private inputs of capital to create estimates of public capital stocks for 48 countries over the 1970-1986 period. The country-by-country data was utilized to estimate the production functions and concluded that overwhelming reasons exist to conclude that data on public capital has a direct implication on employment, private output and investment. Munnell’s estimation of the relative impact of public investment was lesser than the estimation made by Aschauer (1989).

Anfofun (2005) investigated the macroeconomic determinants of investment in Nigeria. The results show that inflation, exchange rate, debt burden, Coup d’etat and political crises negatively influence investment. The negative relationships attest to the major reasons why investors do not have confidence in Nigeria investment climate and such investors are scared away.

Onodugo (2014) investigate the relationship between private and public investment in Nigeria. The study isolated expenditure on infrastructure (which is an expenditure on social service which does not compete with private sector investment) from expenditure on real sectors e.g. agriculture, manufacturing and construction, which competes with private investment. Social services crowd in private sector investment whereas expenditure on real activities such as agriculture, manufacturing and construction crowd out private sector investment. This implies that the private sector is in a good position for investment in agriculture, construction and manufacturing.

From the review of existing literature, it is obvious that capital flight has significant effects on domestic investment. However, some of the previous studies (Anfofun, 2005; Maku & Atanda, 2012; Iya & Aminu, 2012; Umoru, 2013) focused solely on the impact of domestic investment on economic growth without recourse to the robust influence of capital flight on domestic investment. While others concentrated on the determinants of domestic investment (Skully 1997; De-gregorio 2009; Muhammed and Muhammed 2004) with no mention of capital flight effects in the entire study.

Furthermore, previous studies in Nigeria (Ayadi 2008; Ikhide 2004; Adetiloye 2011; Adegbite & Adetiloye, 2013) simply measured capital flight as an aggregate analysis which may partially reveal the disposition and reality of effects of these variables on domestic investment. Hence, this constitutes a measurement gap. A component analysis is required, and forms the crux of this study's contribution.

Methodology and Data

The data employed in the study covered 1981 to 2016 is adequate to show the link between Export, Import, domestic investment and economic growth in Nigeria. The data are sourced from World Development Indicators, 2016 and Central Bank of Nigeria Statistical Bulletin. The study employed ARDL method as a result of the order of the integration of the variable I(0) and I(1). Within the framework of the flexible accelerator model, exchange rate, inflation, political instability and other variables can be included as variables influencing I. Thus the model for domestic investment in Nigeria can be specified in a functional form as;

DOI = f(KF, EXCH, INFL, POL, SAV)………………………………..(i)

Where:

DOI = Domestic Investment

KF = Capital Flight

EXCH = Exchange Rate

The ARDL model specification is;

$$\mathbf{DOI} = \alpha + \sum_{i=1}^{\eta} \beta_i DOI_{t-i} + \sum_{i=0}^{b_1} \theta_i KF_{t-1} + \sum_{i=0}^{b2} \mu_i INFL_{t-1} + \sum_{i=0}^{b_3} \Omega_i\, EXCH_{t-1} + \sum_{i=0}^{b4} y_i POL_{t-1} + \sum_{i=0}^{b5} \mu_i SAV_{t-i} + \mathbf{u_t} \qquad (3.9)$$

The equation (3.9) is an ARDL model and inherently asymptotic. To overcome the problem of orthogonality assumption associated with large ARDL, the study obtained the optimum lag time and thus restated equation (3.9) based on lag 1, ignoring the current level of the regressors to arrive at:

$$DOI = \boldsymbol{\alpha} + \sum_{i=1}^{\eta} \boldsymbol{\beta_i DOI_{t-i}} + \sum_{i=0}^{b_1} \boldsymbol{\theta_i KF_{t-1}} + \sum_{i=0}^{b2} \mu_i \boldsymbol{INFL_{t-1}} + \sum_{i=0}^{b_3} \Omega_i\, \boldsymbol{EXCH_{t-1}} + \sum_{i=0}^{b5} \boldsymbol{y_i POL_{t-1}} + \sum_{i=0}^{b6} \mu_i \boldsymbol{SAV_{t-i}} + \mathbf{u_t} \quad (3.10)$$

Hence, the ARDL model (3.10) is augmented to a special case of unrestricted Error Correction Model (ECM) of the following form:

$$DOI = + \sum_{i=1}^{\eta} \boldsymbol{\beta_i}\, \Delta \boldsymbol{DOI_{t-1}} + \sum_{i=0}^{b_1} \boldsymbol{\theta_i}\, \Delta \boldsymbol{KF_{t-1}} + \sum_{i=0}^{b2} \mu_i \Delta \boldsymbol{INFL_{t-1}} + \sum_{i=0}^{b_3} \Omega_i \Delta \boldsymbol{EXCH_{t-1}} + \sum_{i=0}^{b5} \boldsymbol{y_i} \Delta \boldsymbol{POL_{t-1}} + \sum_{i=0}^{b6} \mu_i \boldsymbol{SAV_{t-i}} + \mathbf{u_t} \quad (3.11)$$

To conduct the bound test co-integration, one must ensure that the error term in equation (3.11) is alike and autonomously circulated with constant variance and zero mean and that the model is stationary. To prove this, let's assume that the dependent variable and independent variables in equation () to be y and x respectively.

$$Y_t = \beta_0 + \beta_1 Y_{t-1} + \beta_2 X_{t-1} + \mu_t \quad (3.12)$$

Increase equation (3.12) by lag 1 to have

$$Y_{t-1} = \beta_0 + \beta_1 Y_{t-2} + \beta_2 X_{t-2} + \mu_{t-1} \quad (3.13)$$

Substitute the value of Y_{t-1} in equation () and solve as follows

$$Y_t = \beta_0 + \beta_1(\beta_0 + \beta_1 Y_{t-2} + \beta_2 X_{t-2} + \mu_{t-1}) + \beta_2 X_{t-2} + \mu_{t-1} \quad (3.14)$$

Furthermore, increase equation (10) by an additional lag

$$Y_{t-2} = \beta_0 + \beta_1 Y_{t-3} + \beta_2 X_{t-3} + \mu_{t-2} \quad (3.15)$$

By substituting into equation (11) you have,

$$Y_t = \beta_0 + \beta_1(\beta_0 + \beta_1(\beta_0 + \beta_1 Y_{t-3} + \beta_2 X_{t-3} + \mu_{t-2}) + \beta_2 X_{t-2} + \mu_{t-1}) + \beta_2 X_{t-2} + \mu_{t-1}) + \beta_2 X_{t-1} + \mu_t \ldots\ldots\ldots\ldots \quad (3.16)$$

Let's factor out the like-terms

$$Y_t = \beta_0 (1 + \beta_1 + \beta_1^2 + \beta_1^3 + \ldots) + \beta_2 (\beta_1 X_{t-2} + \beta_1^2 X_{t-3} + \ldots\ldots) + (\mu_t + \beta_1\mu_{t-1} + \beta_2\mu_{t-2} + \cdots +) \ldots\ldots \quad (3.17)$$

$$Y_t = \beta_0\left[\sum_{i=0}^{\infty} \beta_1^i\right] + \beta_2\left[\sum_{j=1}^{\infty} \beta_1^i\, X_{t-(j+1)}\right] + \sum_{i=0}^{\infty} \beta_1^i\, \mu_{t-i} \quad (3.18)$$

The term i = 0 1 converges to finite limit. That is, if all the roots lie in the unit interval, the ARDL represented in equation would be stable and the bound test to co-integration can be conducted. The results of the stability test are reported in subsequent section. The study can now move ahead and develop the restricted error correction model so as to obtain the equilibrium or adjustment parameter (ECM (-1)).

The long run dynamic equation can be stated as follows:

$$DOI_t = \beta_0 DOI_{t-1} + \beta_2 KF_{t-1} + \beta_3 INFL_{t-1} + \beta_4 EXCH_{t-1} + \beta_4 INFRA_{t-1} + \beta_5 POL_{t-1} + \sum_{i=0}^{b6} \mu_i SAV_{t-i} + W_t \ldots \quad (3.19)$$

Obtain the error term as

$$W_t = DOI_t - (\beta_1 KF_{t-1} + \beta_2 INFL_{t-1} + \beta_3 EXCH_{t-1} + \beta_4 POL_{t-1} + \sum_{i=0}^{b6} \beta_5 SAV_{t-i}) \ldots \quad (3.20)$$

Rename the error term W_t as ECM and restricts it to lag 1, and inserting it into the short run dynamic equation to get;

$$DOI_t = \beta_0 DOI_{t-1} + \beta_2 KF_{t-1} + \beta_3 INFL_{t-1} + \beta_4 EXCH_{t-1} + \beta_5 POL_{t-1} + \beta_5 SAV_{t-1} + ecm_{t-1} \quad (3.21)$$

The study now conducts the bound test to obtain the F-stat and x^2 and compares them with the Pesaran statistics both at lower bond I(0) and upper bond I(1). If the computed F-stat and x^2 – stat fall below I(0), there is no co-integration. If they fall in between I(0) and I(1), test is inconclusive but if they fall above I(1), then there is co-integration.

A Priori Expectation

This has to do with the theoretical expectations of each of the variables included in the model. This expectation has to do with the signs as well as the direction of the variables. It denotes the various ways in which we expect the explanatory variables to affect the dependent variable in the models. Specifically, at 0.05 level of significance, all null hypotheses would be rejected if *p – values* < 0.05.

Independent Variable	**Full Name**	**Expected Sign**
EXCH	Exchange Rate	-/+
KF	Capital flight	-
POL	Political instability	-
INFL	Inflation	-/ +
SAV	Savings	+

Empirical Results

The time series data obtained for the study were exposed to unit root test to control their stationarity in order to escape the delinquent of false regression results. Table 1 shows that the ADF statistic for all the variables. It is pertinent to subject all the variables captured in the model to stationary tests of times series analysis.

Table 1 Unit Root Test Result for the Variables

Series	ADF-Stat	5% Critical value	P-Value
DOI(0)	-1.426	-2.951	0.558
DOI(1)	-11.766	-2.951	0.000
EXCH(0)	-0.135	-2.948	0.938
EXCH(1)	-6.033	-2.948	0.000
FDI(0)	-3.519	-3.544	0.053
FDI(1)	-8.183	-3.548	0.000
ENIFRA(0)	-4.017	-3.544	0.017

Source: Author’s Computation (2018)

Since the order of integration has been established, hypotheses testing can be done with different methods that suite each hypothesis. Hence the variables that made up the model were subjected to ARDL test.

Table 2 ARDL BOUNDS Testing

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-Statistic	8.582	5
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06
Computed F-Statistic: 9.28		Lag (K) = 4
Critical Bound Value (5%)[4]		I(0): 2.86, I(1): 4.01

Source: Source: Author's Computation, (2018)

Table 3 Estimated Long Run Coefficients using ARDL Approach (Dependent variable; DOI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DOI(-1))	0.445524	0.392402	1.135376	0.2740
D(DOI(-2))	0.586624	0.327362	1.791975	0.0933
D(DOI(-3))	0.404510	0.211899	1.908973	0.0756
D(FDI)	0.153480	0.260380	0.589446	0.5643
D(FDI(-1))	1.814623	0.505229	3.591687	0.0027
D(FDI(-2))	1.401521	0.452284	3.098763	0.0073
D(FDI(-3))	0.791206	0.352556	2.244199	0.0403
D(ENINFRA)	0.067951	0.046129	1.473061	0.1614
D(EXCH)	0.033288	0.054230	0.613819	0.5485
D(EXCH(-1))	0.112456	0.061906	1.816568	0.0893
D(EXCH(-2))	-0.183579	0.064646	-2.839754	0.0124
D(EXCH(-3))	-0.164482	0.066745	-2.464338	0.0263
C	2.618584	2.445203	1.070906	0.3011
FDI(-1)	1.766666	0.510672	3.459492	0.0035
ENINFRA(-1)	-0.143500	0.040863	-3.511769	0.0031
EXCH(-1)	0.026775	0.013226	2.024388	0.0611
DOI(-1)	-1.808184	0.448383	-4.032681	0.0011

R-squared	0.809473	Mean dependent var	0.237946
Adjusted R-squared	0.606243	S.D. dependent var	3.839328
S.E. of regression	2.409179	Akaike info criterion	4.901264
Sum squared resid	87.06219	Schwarz criterion	5.679936
Log likelihood	-61.42022	Hannan-Quinn criter.	5.159372
F-statistic	3.983053	Durbin-Watson stat	2.307515
Prob(F-statistic)	0.005258		

Source: Author's Computation (2018)

The long run estimation in the Table 3 shows that the effect of immediate past of foreign direct investment (FDI(-1), FDI into current period and FDI into three period lag on domestic investment are positively related and significant at 5% level. A 1% increase in FDI leads to approximately 1.81%, 1.4% and 0.79% increase in domestic investment.

Essentially, the effect of exchange rate into two lagged periods (EXCH(-2) on domestic investment is negatively related and shows a unit change in EXCH will lead to 0.18 decrease in domestic investment. Domestic investment into three lagged period of exchange rate (EXCH(-3) also indicate negative effect and significant at 5% level. Considering the effect of energy infrastructure, it has positive effect on domestic investment in the current period but non-significant. Energy infrastructures into immediate past indicate a negative relationship with DOI. A unit increase in energy infrastructure leads to 14% decrease in domestic investment and significant 5% level. The regression for the underlying ARDL equation fits very well at R^2 = 80%. Since the long run relationship has been established, it is paramount to also estimate the short run dynamics in order to establish the combined effect and/or speed of adjustment between DOI and other variables.

Table 4 Estimated Short Run Coefficients using ARDL Approach (Dependent variable; DOI)

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DOI(-1))	0.445524	0.392402	1.135376	0.2740
D(DOI(-2))	0.586624	0.327362	1.791975	0.0933
D(DOI(-3))	0.404510	0.211899	1.908973	0.0756
D(FDI)	0.153480	0.260380	0.589446	0.5643
D(FDI(-1))	0.413102	0.299375	1.379880	0.1878
D(FDI(-2))	0.610315	0.313384	1.947501	0.0704
D(FDI(-3))	0.791206	0.352556	2.244199	0.0403
D(INFRA)	0.067951	0.046129	1.473061	0.1614
D(EXCH)	0.033288	0.054230	0.613819	0.5485
D(EXCH(-1))	-0.071123	0.071862	-0.989707	0.3380
D(EXCH(-2))	0.019097	0.067990	0.280878	0.7826
D(EXCH(-3))	0.164482	0.066745	2.464338	0.0263
CointEq(-1)	-0.878184	0.448383	-4.032681	0.0011
Cointeq = DOI - (-0.9770*FDI + 0.0794*INFRA + 0.0148*EXCH + 1.4482)				

Source: Author's Computation (2018)

The results of the combined short-run dynamic coefficients associated with the long-run relationships obtained from the ECM equation are given in Table 4. The signs of the short-run dynamic effects are sustained to the long-run. The equilibrium correction coefficient, estimated -0.87(0.0011) is highly significant and has the expected sign, and indicate a high speed of adjustment to equilibrium after a shock. Approximately 87% of disequilibria from the previous year's shock converge to the long-run equilibrium in the current year. Furthermore, it means the combined effect is 87% which means any disequilibrium in the long run can be corrected by 87% in the short run dynamics.

The regression for the underlying ARDL model passes the diagnostic tests against serial correlation, functional form misspecification, non-normal errors and passed the heteroscedasticity test at 5%. The stability of error corrections model should always be subjected to graphical investigation (Pesaran, Shin and Smith, 1978). A schematic representation of the Cumulative Sum (CUSUM) and the Cumulative Sum of Square (CUSUMSQ) are also established in figure 1 and 2. The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) plots are shown in stability test 1 and 2 which indicate stability in the coefficients over the sample period.

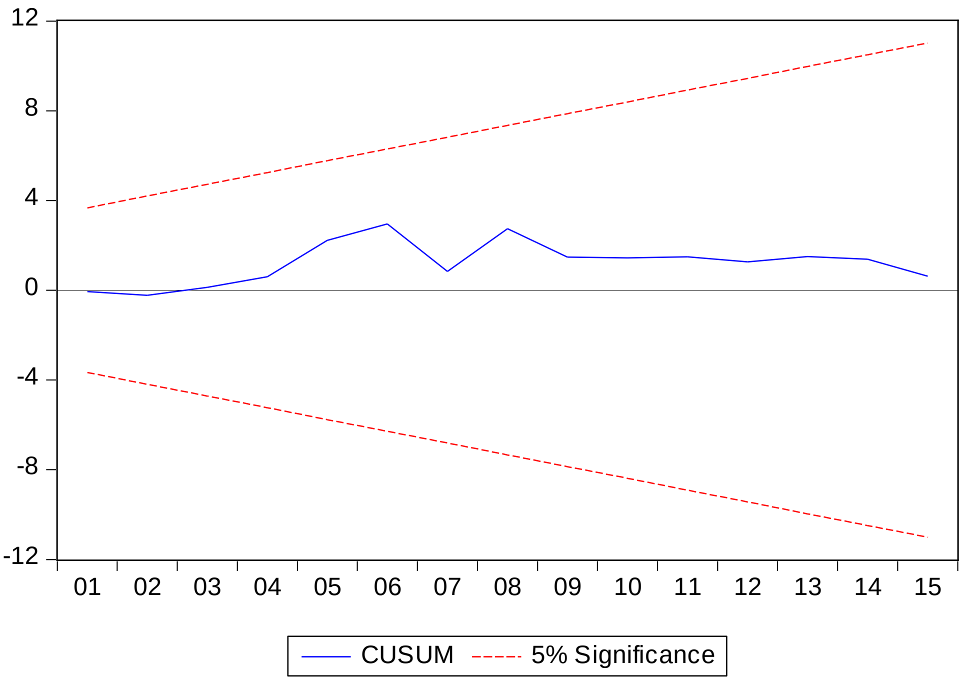

Fig. 1 Cumulative Sum of Recursive Residuals

Source: Author's Eviews Output

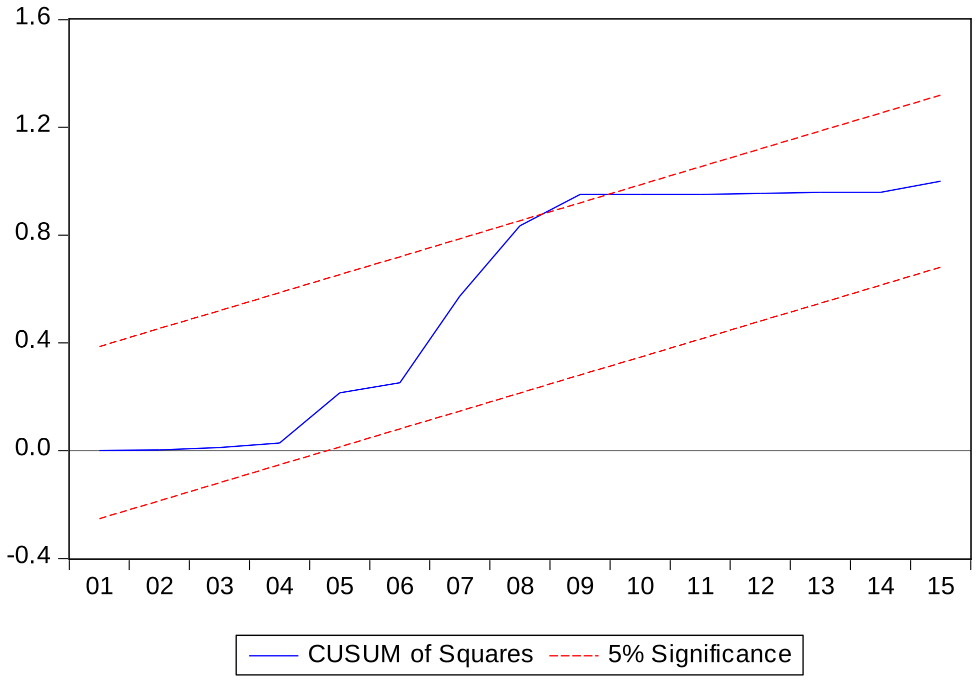

Fig. 2 Cumulative Sum of Square of Recursive Residuals

Source: Author's Eviews Output

Table 4 Heteroskedasticity Test: ARCH

F-statistic	0.621117	Prob. F(2, 9)	0.5448
Obs 'R' squared	1.319549	Prob. Chi-Square(2)	0.5170

Source: Author's Computation, (2018)

Table 5 Breusch-Godfrey Serial Correlation LM Test

F-statistic	1.219883	Prob. F(2, 9)	0.3294
Obs 'R' squared	5.406770	Prob. Chi-Square(2)	0.0670

Source: Author's Computation, (2018)

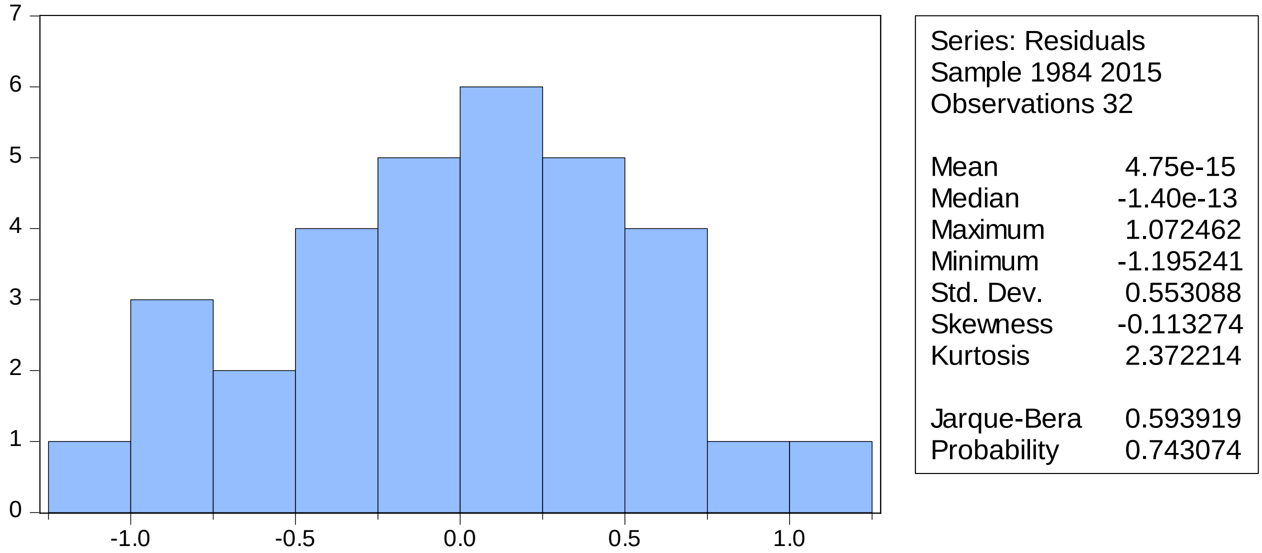

Figure 3 Jarque – Bera Test for Normality

Source: Author's Eviews Output

The Jarque-Bera residual normality test for the model which indicates 0.5939 with a P-value of 74% is more than 5% and shows that the null hypothesis cannot be rejected. It further means that the residuals are normally distributed. The Breusch-Godfrey serial correlation LM test shows a P-Value of 17% for the observed R^2 which means we cannot reject null hypothesis that the residuals are not serially correlated. The heteroscedasticity test also shows a P-Value of 15% for the observed R^2 meaning that the null hypothesis that the residual has no ARCH effect cannot be rejected. All this tests confirm that the model is robust for policy consideration.

Conclusion and Recommendation

The findings reveal that energy infrastructure, FDI, and exchange rate have about 81% combined effect on domestic investment in Nigeria. Yet, FDI has a direct effect on domestic investment while rate of exchange has a substantial adverse effect on domestic investment. Energy infrastructure has positive effect on domestic investment but non-significant which indicate a serious implication on Nigeria economy.

The study submits that energy infrastructure, foreign direct investment and exchange rate have about 81% combined effect on domestic investment in Nigeria. Hence, it is concluded that growth in domestic investment can be achieved by regulating capital flight, exchange rate and inflation within desirable limit that can stimulate growth in domestic investment. Based on the findings and conclusion, the study made the following recommendations; (i) adequate energy infrastructure facilities needed to be put in place, which can stimulate stable FDI that will complement domestic investment in Nigeria and; (ii) government should re-enact and pursue consumption switching policies to cushion the effect of ever increasing exchange rate and inflation rate which have negative effect on growth and development of the economy as well as domestic investments.

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