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2018

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March, 2020

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**ABSTRACT**

*Fluctuations in oil price or exchange rate usually create an uncertain investment climate that has been argued to affect returns to investment and the level of investment in any economy, especially developing countries like Nigeria. The objective of this paper is to examine the short run and long run effect of oil price shocks and exchange rate volatility on investment in Nigeria, using annual time series data from 1981 – 2016. The stationarity property of the series were examined using both Augmented Dickey Fuller (ADF) test and Phillip Perron (PP) unit root test, while the Autoregressive Distributed Lag (ARDL) Bounds Cointegration test was employed to examine if the series are cointegrated. The unit root results for both test are consistent and reveal that the series are a combination of I(0) and I(1), and the Bounds Cointegration test showed that the variables are cointegrated. Consequently, a short run and a long run ARDL model were estimated. The results show that exchange rate volatility significantly affects investment both in the short run and the long run, while oil price shock and other variables have insignificant impact. The study recommends among other things that government should strictly monitor the exchange rate system, boost local crude oil production by fixing the local refineries and increase expenditure on infrastructure, so as to boost investment in the economy*

**Keywords**: Fluctuations, Infrastructure, Investment, oil price, exchange rate, ARDL.

**JEL**: H2, H54

## 1. INTRODUCTION

Macroeconomic variables such as exchange rate and oil price among others are characterized by constant fluctuations, making their values and behaviour become uncertain or unpredictable. Oil price shocks[1] and exchange rate volatility represents unanticipated swing in the international price of oil and exchange rate, which result in a more risky and uncertain investment climate. Investment entails the change is the physical stock of capital over time, which is made possible by forgoing immediate consumption. Broadly speaking, investment is classified into domestic investment (the private domestic investment, the public domestic investment), and the foreign

[1] Shock to oil price can be positive (oil boom) or negative (oil price crash)

private investment (the foreign direct investment and the foreign portfolio investment). Foreign[2] investment is used to augment the saving-investment gap in most capital deficient economies like Nigeria.

The Nigerian economy is a mono-product economy that is majorly driven by crude oil export. Oil revenue constitutes about 90 per cent of total export earnings and on average about 70 percent of government revenues in the annual budget, making the economy highly vulnerable to wide swings in oil prices. A crash in world oil price usually dwindle private and public investment, and result in the inability on the part of the government to raise sufficient revenue for financing recurrent expenditure, and capital projects within the country. More so, overtime, Nigerians have displayed strong preference for imported goods and the industrial sector heavily relies on imported raw material. Hence, fluctuation in the exchange rate (which mostly results in the depreciation of the Naira against major currencies) affects investment through an increase in the cost of doing business. More recently in the year 2016, due to the crash in the price of oil, the Federal government of Nigeria needed to cut-back the allocation given to all the state governments. This resulted into a situation where most states can no longer adequately meet their statutory obligation. Salaries were not paid to workers for several months, leading to reduction in aggregate demand and in investment across the country. The decrease in investment transmits into a reduction in productivity and output level. It further worsened the problem of unemployment, leading to a decline in household consumption, business transactions, and in the overall living standard in the country. Nigeria has had periods of windfall gains from oil revenue in the past, but there is little or nothing to show for it in terms of investment. Investment both in the public and the private sector has remained insufficient to drive inclusive growth, and the country economically underperforms many resource poor countries. In order to reduce the incidence of oil price and exchange rate shocks, government had made attempts to fix local refineries and possibly give new license to more private investors so as to boost local crude oil production. The country also moved from fixed exchange rate to floating and more recently to managed floating exchange rate regime. However, these attempts have failed to yield the desired result, as the country till date is yet to witness massive investment climate. Based on the forgoing, this study seeks to examine the short run and long run effect of oil price shocks and exchange rate volatility on investment in Nigeria. Following this introductory section, the remaining part of this paper is organized into other four sections. Section two reviews related literatures, while section three focuses on materials and method. Section four presents the results and discussion, and section five provides the conclusion and recommendations of the paper.

## 2. REVIEW OF LITERATURE

The work of Bernanke (1983) and Keynes' theory of investment developed in 1936 constitute a pioneering work and theory on investment. Bernanke (1983) posit that variability in oil prices and exchange rate creates uncertainty about the return to investment at the firm level, and this may lead to cyclical fluctuations in aggregate investment. Keynes (1936) pointed out that investment depends on the marginal efficiency of capital[3] (MEC) and interest rate. Other theories of investment includes: flexible accelerator theory, Tobins-q theory and debt overhang

[2] Foreign investment (particularly FDI, which represents investment in physical productive assets) is part of the addition to the capital accumulation and total investment of a nation

[3] Marginal Efficiency of Capital is the expected rate of profit or returns on an investment

hypothesis to mention a few. Theoretically, oil price shock affects investment through demand side and supply side effect. It reduces aggregate demand because the rise in oil price redistributes income between the net oil import and export countries. Also, it leads to a higher cost of production which in many cases translates into higher prices of goods and services. The supply side effect is due to the fact that crude oil is considered as a basic input in the production process. A rise in the oil price reduces aggregate supply since higher energy prices mean that firms purchase less energy; consequently, the productivity of any given amount of capital and labor declines and potential output falls, leading to a decline in investment and growth.

Extant literatures on the impact of exchange rate volatility on investment have reported different findings. Gorg and Wakelin (2001) conducted a study on the impact of exchange rate volatility on direct investment in the US using panel data. No evidence was found for an effect of exchange rate variation on either outward investment or inward investment. Similarly, Omorokunwa and Ikponwosa (2014) using annual time series data on the Nigerian economy, investigated the dynamic relationship between exchange rate volatility and private investment in Nigeria. The study showed that exchange rate has a weak effect on the inflow of FDI to Nigeria both in the long run and in the short run. On the contrary, Okwuchukwu (2015) revealed that exchange rate volatility has negative and significant effect on the inflow of FDI to Nigeria both in the long run and in the short run. The study further established that fluctuations in key macroeconomic variables can affect investment through its impact on consumption expenditure. Examining the impact of oil price shock on investment, Riman *et al.* (2013) used annual time series data for the period 1970 – 2010 to examine the asymmetric effect of oil price shock on exchange rate and domestic investment. The findings show that oil price shocks have negative impact on public and private investment and industrial production. In Ghana Wiafe *et al.* (2015) also found that oil price shocks lead to reduction in investment. They further reveal that there is a long run relationship between domestic private investment, oil price shocks, exchange rate, inflation, income and credit to private sector. However, Ogundipe and Ogundipe (2012) estimated the impact and transmission channel of oil price shocks on investment and how it affects the Nigerian economy. Using annual time series data they concluded on the contrary that oil price shocks does not significantly explain investment, since it affects investment through savings. On the combined impact of oil price shock and exchange rate volatility on economic growth, studies carried out by Rautava (2004) in Russia and Shafi and Hua (2014) in Japan have established that fluctuations in oil prices and real exchange rate significantly influenced economic growth. They however did not state whether the effect was positive or negative. Aliyu (2009) used a quarterly time series data from 1986 to 2007 to analyze the short run and long run impact of oil price shocks and appreciation in the level of exchange rate on economic growth in Nigeria. The study finds that the variables exert positive impact on economic growth, indicating the possibility of affecting investment positively or leaving investment unaffected. On the contrary, Olanipekun (2016) found that oil price shocks have negative effect on economic growth, external reserve and exchange rate. Moreover, studies such as Wilson *et al.* (2014) and Alley *et al.* (2014) have reported that oil price shocks does not significantly affect economic growth.

The empirical review shows that studies on oil price shocks and exchange rate volatility have three major strands in the literature. Some studies (see Gorg & Wakelin, 2001; Omorokunwa & Ikponwosa, 2014; Okwuchukwu, 2015) have examined the impact of exchange rate volatility on investment. Others such as Riman *et al*. (2013), Ogundipe and Ogundipe (2012) and Wiafe *et al*. (2015) assessed the impact of oil price shocks on investment, while studies such as Rautava

(2004) Shafi and Hua (2014) Aliyu (2009) Olanipekun (2016) analyzed the combined impact of oil price shock and exchange rate volatility on economic growth. In each of these cases, authors differ significantly in their findings. For instance, while Gorg and Wakelin (2001), Omorokunwa and Ikponwosa (2014) reported no significant relationship between exchange rate volatility and investment, a more recent study by Okwuchukwu (2015) found a significant negative relationship. Also while Ogundipe and Ogundipe (2012) found that oil price shocks does not significantly explain investment, Riman *et al*. (2013) and Wiafe *et al*. (2015) reported a negative and significant impact. In the case of the combined impact of oil price shock and exchange rate volatility, Aliyu (2009) reported a positive impact of oil price shocks and exchange rate volatility on economic growth, while Rautava (2004) and Shafi and Hua (2014) found no significant impact. This reveals that the literature is inconclusive and justifies the need for further research in this area. In addition, there exist no study in the literature that specifically combined the impact of oil price shocks and exchange rate volatility on investment to the best of our knowledge. This study therefore seeks to fill this gap.

3. MATERIALS AND METHOD

### 3.1 Theoretical Framework

This paper adopts the real business cycle (RBC) theory as the base line model. As a model for the aggregate economy, it extends the Ramsey model to incorporate aggregate fluctuations, such as shocks to oil price and volatility to exchange rate. The model assumes among other things that the economy consist of a large number of identical, price taking firms and a large number of identical, price taking households. It emphasizes shocks to the economy's production technology specified as a Cob-Douglas production function given as:

$$Y_t = A(K_t^{\alpha} L_t^{1-\alpha}) \qquad 0 < \alpha < 1 \tag{1}$$

Where: $Y_t$ , $K_t$ and $L_t$ is the current period's output, capital stock and labour input respectively. $A_t$ is a constant known as the efficiency parameter. The parameters α and 1- α are the output elasticity of capital and labour respectively. 0 < α < 1 implies that the production function exhibits a decreasing returns since the value of α lie between 0 and 1. Taking output (Y) to be solely allocated to or determined by the level of investment, we have:

$$Y_t = I_t \tag{2}$$

Substituting Eq (1) into Eq (2) and rearranging gives:

$$I_t = AK_t^{\alpha} L_t^{1-\alpha} \tag{3}$$

Taking natural log of Eq (3) yields:

$$InI_t = InA_t + \alpha InK_t + (1-\alpha)InL_t \tag{4}$$

Letting (1-α) = β, and $InA_t = \gamma$. Re-arranging Eq(4) gives:

$$InI_t = \gamma + \alpha InK_t + \beta_1 InL_t + \delta InZ_t \tag{5}$$

Where γ represent the constant; α, β and δ are the parameters, $InK_t$ and $InL_t$ captures the key regressors (oil price shocks and exchange rate volatility) and $InZ_t$ represents other variables included in the model.

### 3.2 Model specification

Drawing from the previous works by Agosin and Mayer (2000), Kumar and Pradhan (2002), Eregha (2012) and Wiafe et al. (2015), the model for this study examines Total Investment (TINV) as a function of Oil Price Shocks (OPS), Exchange Rate volatility (EXRV), Interest rate (INTR), Inflation rate (INFR), and real Gross Domestic Product growth rate (GDPGR). This is specified as:

TINV = f (OPS, EXRV, INTR, INFR, GDPGR) (6)

This is further specified to show the non-exactness of the relationship by incorporating the stochastic variable as follows:

$$TINV_t = \beta_0 + \beta_1 OPS_t + \beta_2 EXRV_t + \beta_3 INTR_t + \beta_4 INFR_t + \beta_5 GDPGR_t + u_t \quad (7)$$

Where; TINV is total investment is proxy by gross fixed capital formation (GFCF). OPS is oil price shocks and EXRV is exchange rate volatility, both of which are generated using the generalized autoregressive conditional heteroscedasticity (GARCH) model. INFR is inflation rate proxy by the general consumer price index, INTR is interest rate proxy by prime lending rate and GDPGR is the growth rate of the gross domestic product. $\beta_0$, $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$ and $\beta_5$ are the parameters of the model to be estimated, while $u_t$ is the stochastic error term. It is expected a priori that $\beta_0 > 0$, $\beta_1 < 0$, $\beta_2 \lesseqgtr 0$, $\beta_3 < 0$ $\beta_4 < 0$ $\beta_5 > 0$

### 3.3 Nature and source of data

To examine the relationship between oil price shocks, exchange rate volatility and investment in Nigeria, this study makes use of annual time series data covering a period of thirty six (36) years from 1981 to 2016. Data on oil price and exchange rate is sourced from the United States' Energy Information Administration (EIA) website and the Central Bank of Nigeria (CBN) statistical bulletin respectively, while others are sourced from the World Development Indicator (WDI).

### 3.4 Unit root test

Many econometric techniques are based on the assumption that the mean and variance of the series are constant over time, this implies they are applicable only to stationary series. To critically analyze the unit root properties of the series, this study adopts the traditional Augmented Dickey-Fuller (ADF) developed by Dickey & Fuller (1981) and Phillips-Perron (PP) unit root tests developed by Phillip & Perron (1988). The ADF and PP test specified for this study are given in Eq (8) and Eq (9) respectively.

$$\Delta Z_t = \alpha_1 + \alpha_2 t + \alpha_3 Z_{t-1} + \sum_{i=1}^{p} \beta_i \Delta Z_{t-1} + \xi_t \quad (8)$$

$$\Delta X_t = \alpha_0 + \alpha_t + \beta_0 X_{t-1} + \eta_t \quad (9)$$

Where: p is the number of lags in the dependent variable, $\alpha$ and $\beta$ are parameters, $\xi_t$ and $\eta_t$ are the stochastic error term, Δ is the first difference operator and t is the time trend. In both tests, we reject the null hypothesis of non stationarity if the test statistic is less than the critical value in real terms.

## 3.5 Estimation Technique

### *3.5.1 Measure of Volatility/shock*

This study measures volatility using the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) developed by Bollerslev (1986). This volatility measure is preferred for being a measure of time varying volatility and is more appropriate with higher frequency time series data. The data on oil price and exchange rate are collected on monthly basis in order to be appropriate for generating volatility using GARCH. The volatility generated for both series is thereafter converted to annual data for the purpose of further analysis.

The GARCH (p, q) model is specified as follows:

$$Y_t = a + \beta^t X_t + \mu_t \tag{10}$$

$$\mu_t \sim N(0, h_t)$$

Where:

$$h_t = \gamma_0 + \sum_{i=1}^{p} \delta_1 h_{t-1} + \sum_{j=1}^{q} \gamma_j \mu_{t-j}^2 + \sum_{k=1}^{m} \mu_k X_k \tag{11}$$

### *3.5.2 Autoregressive Distributed Lag (ARDL) Model*

To estimate the short run and long run relationship between oil price shock, exchange rate volatility and investment, this study adopts the Autoregressive Distributed Lag (ARDL) model modified by Pesaran, Shin and Smith (2001). The short run and long run model ARDL (p,q) model for this study is specified in Eq (12) and Eq (13) respectively as follows:

$$\Delta TINV_t = \alpha_0 + \sum_{i=1}^{p} \beta_{1i} \Delta TINV_{t-1} + \sum_{j=1}^{q} \beta_{jk} \Delta Z_{t-j} + \rho ECM_{t-1} + \mu_t \tag{12}$$

Where the ARDL bounds cointegration[4] establishes no long run relationship, the short run model with error correction term in Eq (12) above is estimated. However, where an evidence of a long run relationship is found, the long run model given in Eq (13) below will also be estimated.

$$TINV_t = \alpha_0 + \alpha_1 \sum_{i=1}^{p} TINV_{t-1} + \alpha_2 \sum_{i=0}^{q1} OPS_{t-1} + \alpha_3 \sum_{i=0}^{q2} EXRV_{t-1} + \alpha_4 \sum_{i=0}^{q3} INTR_{t-1} + \alpha_5 \sum_{i=0}^{q4} INFR_{t-1} + \alpha_6 \sum_{i=0}^{q5} GDPGR_{t-1} + \mu_t \tag{13}$$

$\alpha_i$, $\beta_i$ represent the long run and short-run coefficients of the model respectively, $\rho$ is the coefficient of the error correction term that measures the speed of adjustment to equilibrium in the event of shocks to the system, Z represents the set of the explanatory or independent variables and $\mu_t$ is the error term.

[4] The ARDL bounds cointegration test, is adopted in place of the Johansen cointegration test to ascertain the existence or otherwise of a long run relationship. If the F-statistic is greater than the lower I(0) and upper I(1) bound critical values provided by Pesaran *et al.* (2001), then a cointegration is established and long run model is estimated. Otherwise, only the short run model is estimated.

4. RESULTS AND DISCUSSION

## 4.1 Unit root test Result

The result of the Augumented Dickey-Fuller (ADF) test and Philip Peron (PP) test employed both at level and then first difference to test for the stationarity of each of the series is presented below.

**Table 1: Unit root Result**

| | ADF | | PP | | |
|---|---|---|---|---|---|
| variables | levels | first difference | levels | first difference | remarks |
| TINV | -3.75*** | -5.69 | -3.89*** | -3.84 | I(0) |
| OPS | -6.76*** | -9.50 | -6.83*** | -17.67 | I(0) |
| EXRV | -3.44* | -5.57 | -3.39* | -7.43 | I(0) |
| INTR | -2.18 | -5.38*** | -2.11 | -6.69*** | I(1) |
| INFR | -3.89* | -5.34 | -2.73 | -9.62*** | I(1) |
| GDPGR | -5.03*** | -8.67 | -5.03*** | -25.86 | I(0) |

*Source: Researcher's computation (2018)*

*Note: ***. ** and * indicate the rejection of the null hypothesis of a unit root at 1%, 5% and 10%, level of significance respectively.*

Table 1 above is the unit root result for ADF and PP test estimated with intercept and trend. It shows that all the variables are stationary at levels I(0) using at most 10 percent level of significance, except for interest rate and inflation rate that became stationary after first difference I(1). This therefore requires the use of bounds cointegration test to check for a long run relationship since there is a mixture of I(0) and I(1) variables.

## 4.2 Descriptive Result

Table 2: Descriptive analysis of variables

| | TINV | OPS | EXRV | INTR | INFR | GDPGR |
|---|---|---|---|---|---|---|
| Mean | 12.77 | 0.02 | 0.01 | 17.78 | 19.60 | 3.53 |
| Median | 12.03 | 0.01 | 0.01 | 17.70 | 12.55 | 4.03 |
| Maximum | 35.22 | 0.14 | 0.01 | 31.65 | 72.84 | 33.74 |
| Minimum | 5.46 | 0.01 | 0.00 | 8.92 | 5.38 | -13.13 |
| Std. Dev. | 6.33 | 0.02 | 0.00 | 4.97 | 17.69 | 7.61 |
| Skewness | 2.00 | 5.08 | -0.82 | 0.19 | 1.66 | 1.22 |
| Kurtosis | 7.53 | 28.84 | 2.64 | 3.52 | 4.53 | 8.70 |
| Jarque-Bera | 54.90 | 1156.67 | 4 26 | 0.63 | 20.12 | 57.74 |
| Observations | 36 | 36 | 36 | 36 | 36 | 36 |

*Source: Author's Computation (2018)*

Table 2 above presents the descriptive statistics of the variables employed in this study. The result reveals some level of consistency in all the series as their mean and median lie between the minimum and maximum values. Inflation has the highest mean, while exchange rate volatility has the lowest. For most of the variables, the skewness and kurtosis are close to the benchmark of zero and three (3) respectively, making them symmetrical. The Jarque-Bera statistic also shows that the variables are somewhat normally distributed.

### 4.3 Bounds Cointegration test

Table 3: Bounds cointegration result

| Estimated equation : | TINV = *f*(OPS, EXRV, INTR, INFR,GDPGR) | |
|---|---|---|
| F-statistics | 10.56249 | |
| Significant level | I(0) bound | I(1) bound |
| 10 percent | 2.26 | 3.35 |
| 5 percent | 2.62 | 3.79 |
| 2.5 percent | 2.96 | 4.18 |
| 1 percent | 3.41 | 4.68 |
| No of Observation | 34 | |
| Optimal Lag | 2 | |
| No of Variables | 6 | |
| Decision | Co-integrated | |

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

The bounds cointegration result in Table 3 above shows that the value of computed F-statistics 10.56249 is higher at all the significant levels than both the lower bound critical value and the upper bound critical values given by Pesaran, Shin, and Smith (2001). This shows that there is cointegration, and provides a strong evidence for rejecting the null hypothesis of no long-run relationship between total investment and the explanatory variables. Hence, the short run and the long run model is estimated.

### 4.4 Short run Result

Table 4: Short run Error Correction (ECM) result

| **Dependent variable:** Total investment D(TINV) | | | | |
|---|---|---|---|---|
| **Ind. Variables** | **Coefficients** | **Std. Error** | **t-statistics** | **Prob** |
| D(OPS) | 11.575676 | 17.743183 | 0.652401 | 0.5201 |
| D(EXRV) | 527.055383 | 160.760698 | 3.278509 | 0.0031*** |
| D(INTR) | 0.266383 | 0.117649 | 2.264224 | 0.0325** |
| D(INFR) | -0.017189 | 0.022053 | -0.779410 | 0.4431 |
| D(GDPGR) | -0.044791 | 0.048122 | -0.930779 | 0.3609 |
| ECM(-1) | -0.434675 | 0.096637 | -4.498025 | 0.0001*** |
| C | 0.666848 | 2.568323 | 0.2596343 | 0.7973 |
| Adjusted $R^2$ | 0.784086 | S.D. dependent var | 3.815283 | |
| S.E of regression | 3.028967 | Akaike info criterion | 4.204958 | |
| F-statistics | 15.97983 | Schwarz criterion | 4.608995 | |
| Prob(F-Statistics) | 0.000000 | DW- statistic | 1.733475 | |

*Source: Author's Computation (2018)*

*Note: ***, **, * indicate statistical significance of the coefficients at 1%, 5% and 10%, respectively*

Table 4 above presents the estimated result of the short run model. It reveals that exchange rate volatility and interest rate have positive coefficients and are statistically significant at 1 percent and 5 percent respectively in explaining total investment in the short run. This means that oil price shocks, inflation rate and growth rate of gross domestic product does not affect investment in the short run. This is in contrast with the findings of Gorg and Wakelin (2001) and

Omorokunwa and Ikponwosa (2014), who both found that exchange rate volatility, does not significantly affect investment. More specifically, interest rate, inflation rate and growth rate of gross domestic product are not correctly signed following the a priori expectation. A one unit increase in exchange rate volatility and interest rate will lead to 527.05 and 0.26 units increase in total vestment respectively. The result further shows that the model has a good fit with the $R^2$ = 0.78 and the Durbin-Watson statistics close to 2. In addition, the error correction coefficient is correctly signed and statistically significant at 1 percent level.

### 4.5 Long run Result

Table 5**:** Long-run coefficients

| **Dependent variable:** Total investment (TINV) | | | | |
|---|---|---|---|---|
| **Ind. Variables** | **Coefficients** | **Std. Error** | **t-statistic** | **prob** |
| OPS | 26.630615 | 37.825492 | 0.704039 | 0.4879 |
| EXRV | 1212.5261 | 407.55939 | 2.975091 | 0.0064*** |
| INTR | -0.075403 | 0.23249 | -0.324327 | 0.7484 |
| INFR | -0.039544 | 0.055284 | -0.715277 | 0.4811 |
| GDPGR | -0.103044 | 0.110047 | -0.936359 | 0.3582 |
| C | 1.534129 | 5.712371 | 0.268563 | 0.7905 |

*Source: Author's Computation (2018)*

The result of the long run model is presented in Table 5 above. Similar to the short run result, it reveals that exchange rate volatility has a very large positive coefficient and is statistically significant at 1 percent in explaining investment in the long run. However, the result shows that investment is not affected by oil price shocks (corroborating the findings of Ogundipe and Ogundipe, 2012), inflation rate, interest rate and growth rate of gross domestic product in the long run. Specifically, a one unit increase in exchange rate volatility leads to 1212.52 unit increase in investment. Based on the a priori expectation, interest rate and inflation rate have the correct sign, while oil price shocks and growth rate of gross domestic product does not.

### 4.6 Post estimation result

Diagnostic tests check the accuracy of the model in terms of the reliability of its estimates for inference purpose. Table 6 below presents the results of serial correlation, functional form, normality test and heteroscedasticity test. A closer look at the result shows that there is no problem of autocorrelation and heteroscedasticity, the model is correctly specified and the variables are normally distributed.

Table 6: Diagnostic test result

| Test Statistics | Jarque-Gera and F-Statistics IP-value] |
|---|---|
| Serial Correlation | F(2,23) = 1.702409 [0.2044] |
| Functional Form test | F(1,24) = 6.700909[0.0161] |
| Normality Test | J-Bera (0.077165) prob[0.962152] |
| Heteroscedasticity | F(8,25) = 0.461722[0.8711] |

*Source: Author’s Computation (2018)*

## 5 CONCLUSIONS AND RECOMMENDATIONS

This study extensively examined the relationship between oil price shocks, exchange rate volatility and investments in Nigeria from 1981 to 2016, by estimating a short run and a long run ARDL model. The unit root property of the series using the ADF and PP test revealed a mixed stationarity of I(0) and I(1), justifying the use ARDL model as the estimation technique. The bounds cointegration test reveals that a long run relationship exist among the variables, hence, a short run and long run model was estimated. Exchange rate volatility is highly significant in explaining investment in both the short run and the long. Although not correctly signed, interest rate is found to affect investment in the short run. However, the oil price shocks, inflation rate and growth rate of gross domestic product does not significantly affect investment in the short run and the long run. A reason that can be advanced for the insignificant effect of oil price shock on investment is due to positive net oil export effect, as Nigeria doubles as both an oil importer and an oil exporter. More so, growth figures in Nigeria are mostly driven by increase in market price and not output, hence, the insignificant effect on investment.

This study therefore recommends firstly that the federal government should keep a constant check on the foreign exchange market activities through a strict monitoring of the managed floating system that is currently being adopted, since the exchange rate significantly affects investment. In addition, the CBN must continuously review the conditions governing the establishment and operations of bureau de change institutions in the country, to curb parallel market activities. Secondly, to reduce the dependence on oil importation, so as to cushion the impact of oil price shock, the government should boost local crude oil production by fixing local refineries and giving license to more private investors in the oil and gas sector. Thirdly, government expenditure should be focused on building more and maintaining already built infrastructures in order to enhance business and other economic activities that boost investment in the country.

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