

Government Capital Expenditure, Foreign Direct Investment, and Economic Growth Relationship in Nigeria

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Abstract

The relationship among government capital expenditure, foreign direct investment (FDI), and economic growth in Nigeria has been examined by this study. It specifically investigated the impact of government capital expenditure, and FDI, on economic growth in the country during the period from 1980 to 2012. The analysis of the relationship was carried out by employing some econometric techniques which included Ordinary Least Square (OLS), cointegration and Granger causality to ascertain the causal relation between variables, as well as the extent to which one variable impacted on the other. Findings from the analysis revealed that the both of government capital expenditure and growth Granger caused each other, as a unidirectional causality was established between growth and FDI. However, a Granger no-causality relationship existed between government capital expenditure and FDI. It was further revealed that government capital expenditure had a significantly positive influence on economic growth. Thus, the study suggests that government should channel more of her expenditure on capital projects like power, energy, road, health, education, and commercial agriculture in order to boost growth, as well as attract more FDI into the country.

Keywords: Economic growth, FDI, government capital expenditure, cointegration, Nigeria

1. Introduction

Government expenditure and FDI are two macroeconomic variables that could affect economic growth either individually or as a group. FDI could be a paramount source of growth because its effect could be spread through technological spillover thereby raising aggregate productivity of the economy. Wu (2000) has asserted that FDI brings externalities such as promotion of competition, investment in research and development to the recipient country. Also, World Bank (2002) found that FDI promote economic development of the host country by promoting productivity growth. On the contrary, some studies which include Kolawole (2013) and Rahaman (2015) stressed a no-causality or an insignificant relationship between FDI and growth. However, the potency of FDI to drive growth, according to Makki and Somwaru (2004); and Moura and Forte (2010), depends on the existing internal conditions of the host country. Government expenditure, being an instrument for economic adjustment, is well known for having effect on economic growth. The nature of the impact is, however, diverse. While some authors (for example, Le & Suruga 2005a; and Taban 2010), see its impact as negative or non-significant, others like Alexiou (2009) rather suggest a positive and significant impact.

Meanwhile, Le and Suruga (2005a) have empirically examined the factors that affect per capita growth rate, and found positive contributions in both public investment and FDI. Further, they checked the effect of public investment on FDI, and found that the positive effect of FDI on per capita growth reduced when public investment was greater than 8 to 9 per cent. That is to say that, excessive spending in public capital expenditure can reduce the positive impact of FDI on economic growth. Ordinarily, the importance of such finding should trigger further research on whether likely situation exists in a developing country or not.

Thus, FDI inflows to developing country like Nigeria are necessarily directed to the oil sub-sector where records show that total inflow dropped from USD 20.3 billion in 2008 to USD 8.9 billion in 2011. But then, despite the fall in the value of FDI inflow to the oil sub-sector, economic performance of the country has been favourable given the real GDP growth of 5.4 per cent, 8.3 per cent, and 7.8 per cent in 2011, 2012, and 2013, respectively. Meanwhile, the trend in government capital expenditure as percentage of GDP recorded 11.6 per cent and 13.0 per cent in 2000 and 2002, respectively. The total value, however, amounted to ₦2059 billion (USD 13.03 billion) in 2013 (see African Economic Outlook, 2014). Therefore, which of FDI and government capital expenditure impacted on economic growth in Nigeria?

As such, the objective of the present study is to specifically evaluate the average impact of FDI, and government capital expenditure on economic growth in the country. Hence, since there is no study, as far as we know, that has considered the interactive relationship among government capital expenditure, FDI and economic growth in Nigeria, the present study finds justification for examining the relationship that links the variables.

Essentially, the significance of this study also premised on the propensity of Nigeria to sustain, and possibly improve on, the growth performance of the economy via provision of employment, infrastructure, as well as reducing inequality, ala Millennium Development Goals (MDGs). As such, despite the dwindling amount of FDI inflows into the economy coupled with declining relative share of government capital expenditure in total spending, the country desires policy measure that can stimulate job creation and help improve the growth rate of per capita income necessary for poverty reduction. Thus, the relevance of investigation on whether, or not, government capital expenditure and FDI spur economic growth in Nigeria.

The remaining part of the paper proceeds thus: Section two stylizes some facts on FDI, government capital expenditure and growth in Nigeria. Literature is reviewed in section three as section four presents the methodology. Empirical results are discussed in section five, while conclusion is drawn with policy implication in section six.

2. Stylized Facts on FDI, Public Expenditure and Economic Growth in Nigeria

The Nigerian economy demonstrates mixed performances marked by macroeconomic imbalances. As government capital expenditure declined by 26.7 per cent below its 2001 value, the economy slowed in 2002 though with improvement in some economic fundamentals. The rate of real GDP growth slowed from the revised 4.2 per cent in 2001 to less than 1 per cent in 2002. In 2003, however, government expenditure remained large with a ₦1 trillion (USD 7.6 billion) budget. This somehow propelled a growth rebound in the same year to an estimated 5 per cent and was afterwards projected at 3.7 per cent and 3.8 per cent in 2004 and 2005, respectively. The economic performance kept driven by the non-oil sector with real GDP growth of 5.4 per cent, 8.3 per cent and 7.8 per cent in 2011, 2012 and 2013, respectively.

Total FDI into the country was USD 8.9 billion in 2011, representing 20 per cent of the total FDI to Africa in the same year. However, these investments were mostly in the oil and gas sub-sector. On the average, foreign capital inflows increased from USD 16.6 billion in 2012 to USD 21.3 billion in 2013. Portfolio inflow amounted to 83 per cent, an increase of 55 per cent relative to 2012 figures, while FDI, which reduced by 21.4 per cent in 2013, accounted for 17 per cent. The fall in FDI could be partly attributed to the sluggish global economic recovery and the state of play in the oil sub-sector given that a large percentage of FDI inflows into the economy go to the oil sub-sector (see African Economic Outlook, 2014). Essentially, the trends of real GDP growth, government capital expenditure, and FDI are demonstrated in Figure 1.

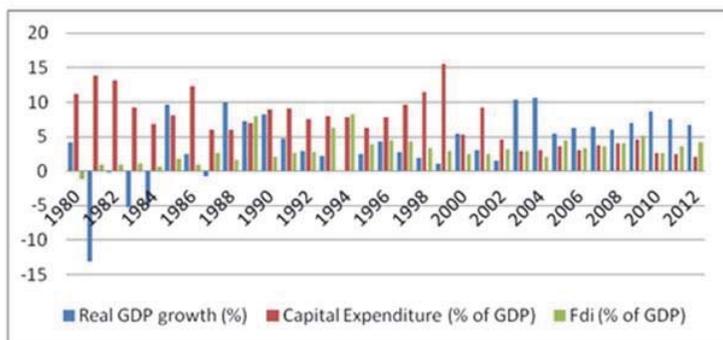


Figure 1: Real GDP growth, capital expenditure (% of GDP) and FDI (% of GDP) in Nigeria, 1980-2012.

Source: Authors' representation using data from CBN (2013) and IMF (2013)

Meanwhile, following its rebased total GDP from 1990 to 2010, the estimated size of the economy increased by 89 per cent and resulted in an estimated USD 510 billion nominal GDP. This impressive growth was maintained with an estimated 7.4 per cent growth of real GDP in 2013, up from 6.5 per cent in 2012. Estimated FDI inflows, nevertheless, was USD 76.75 billion and USD 84.56 billion in 2012 and 2013, respectively.

3. Review of Literature

3.1 Empirical Review of the Relationship between FDI and Growth

Following the Eclectic Theory of FDI, Lucas (1993), Moore (1993), and Cernat and Vranceanu (2002) opined that as economic growth rises, FDI inflows into host countries tend to be encouraged. In corroboration, Chakrabarti (2001), and Asiedu (2002) also showed that economic growth was an important determinant of FDI as higher economic growth resulted in greater FDI inflows. During the investigation of the linkage between FDI and economic growth in Vietnam, Lan (2006) found that FDI and economic growth were important determinants of each other. Also, the examination of the impact of FDI on economic growth in Indonesia over the period from 1997 to 2006, Khaliq and Ilan (2007) revealed that, at the aggregate level, FDI had positive effect on economic growth. In a review of the FDI-economic growth nexus in the context of developing countries, and particularly sub-Saharan Africa, Adams (2009) suggested that FDI was a necessary but not sufficient condition for economic growth. On the analysis of the effect of FDI on economic growth in Togo over 33 years from 1975 to 2008, Aboudou (2010) found that FDI had positive impact on economic growth. By implication, the empirical analysis showed that FDI alone played an ambiguous role in contributing to economic growth in the country. While analysing the impact of FDI inflow and economic growth in a pre and post deregulated Nigerian economy between 1970 and 2010, Olusanya (2013) reported a unidirectional causal relationship from FDI to growth in the pre-deregulation era (1970-1986) and a no-causal relationship between the variables in the post-deregulation era (1986-2010). In the overall period, however, a bidirectional relationship was found between the variables.

3.2 Empirical Review of the Relationship between Public Expenditure and Growth

Depending on the intertemporal elasticity in consumption, Gong and Zou (2002) opined that the volatility in government expenditure could positively or negatively be associated with economic growth. Furthermore, AlBataineh (2012) investigated the impact of government expenditures on economic growth in Jordan during the period 1990 to 2010. Results suggested that government expenditure at the aggregate level had positive impact on GDP growth in compatibility with the Keynesians theory. On the validity of the Wagner's hypothesis in Sudan, Salih (2012) found that growth of per capita real GDP had unidirectional relationship with government expenditure. Alshahrani and Alsadiq (2014) empirically examined the effects of different types of government expenditures on economic growth in Saudi Arabia over the period from 1969 to 2010. The study suggested that healthcare expenditure stimulated growth in the long-run.

Moreover, for Nigeria, Oyinlola (1993) reported a positive impact of defence expenditure on economic growth. Also, Ogiogio (1995) revealed a long-term relationship between government expenditure and economic growth and also discovered that capital expenditure impacted mildly on growth in the country. Furthermore, Fajingbesi and Odusola (1999) observed that real government capital expenditure had significant positive effect on real output in Nigeria. However, Akpan (2005) concluded that there was no significant relation between most components of government expenditure and economic growth in Nigeria. Adeniyi and Bashir (2011) found that government expenditure on agriculture, education, defense and internal security influenced economic growth in the country. Usman et al (2011) investigated the effect of federal government expenditure on economic growth in Nigeria. Results of the study showed that in the short run public spending had no impact on growth, but in the long run, a relationship was established between the two variables. Essentially, Nurudeen and Usman (2010) showed that government expenditure on education had negative effect, as against positive impact of government expenditure on transport, communication, and health on economic growth. In corroboration, Adewara and Oloni (2012) explored the relationship between the composition of public expenditure and economic growth in Nigeria between 1960 and 2008. The study found that expenditure on education failed to enhance economic growth while expenditure on health and agriculture contributed positively to growth.

Nasiru (2012)'s investigation on the relationship between government expenditure (disaggregated into capital and recurrent) and economic growth in Nigeria over the period from 1961 to 2010 revealed that long-run relationship did not exist between the variables. However, a unidirectional causality from public expenditure to economic growth was established. Garba and Abdullahi (2013) investigated the long-run and causal relationships between public expenditure and economic growth in Nigeria over the period from 1970 to 2008. The results indicated a significant long-run positive relationship and bidirectional causality between the variables. Muse, Olorunleke and Alimi (2013) examined whether there was statistical evidence for a causal relationship between federal government expenditures and growth in real per-capita GDP in Nigeria between 1961 and 2011. The cointegration result revealed no long-run relationship between the variables as Toda and Yamamoto's causality results confirmed that Wagner's Law did not hold in the short-run period in the country. Oni, Aninkan and Akinsanya (2014) evaluated the joint effects of capital and recurrent expenditures of

government on growth in Nigeria during the period from 1980 to 2011. The results showed that both capital and recurrent expenditures impacted positively on growth in the country. A weak impact was, however, obtained from the capital expenditure.

3.3 Empirical Review of the Relationship among FDI, Public Expenditure and Growth

In the examination of the simultaneous impact of public expenditures and FDI on economic growth of a sample of 105 developing and developed countries for the period from 1970 to 2001, Le and Suruga (2005a; 2005b) found that (i) FDI, public capital, and private investment played important roles in promoting economic growth, (ii) public non-capital expenditure had negative impact on economic growth, and (iii) excessive spending in public capital expenditure could hinder the beneficial effects of FDI. While analyzing the role of the government policies in attracting FDI, Goodspeed, Martinez-Vazquez and Zhang (2007) found that increasing government expenditure, such as investment in infrastructure, attracted FDI. Jayachandran and Seilan (2010) investigated the relationship among trade, FDI and economic growth of India over the period from 1970 to 2007. Findings from the study revealed a long-run equilibrium, as well as causal relationships between economic growth and FDI under an open-door policy in the country. In the estimation of the interrelationship among public expenditure, FDI and economic growth in Pakistan for the period 1975 to 2008, Husnain et al (2011) claimed that public expenditure retarded economic growth where as FDI was positively associated with growth as the effect remained strengthened until public spending grew less than 6 per cent per annum. Beyond this level, positive effects of FDI became fragile which suggested that excessive involvement of government in economic activity might hinder the beneficial effects of FDI. During the investigation of the dynamic interactions among FDI, private domestic investment and public domestic investment in Turkey for the period 1970 to 2009, Saglam and Yalta (2011) found that there was no long-run relationship among FDI, public investment and private investment thereby impeding the contribution of FDI to economic growth in Turkey.

4. Methodology

In economics, several hypotheses and theories have been proposed in order to describe the behaviour of economic agents and the relationships between economic variables. Although these propositions may be theoretically appealing and logically correct, they may not be practically relevant unless they are supported by real world data. In this regard, econometrics comes relevant because it utilizes data to analyze the relationships between economic variables. Meanwhile, in econometrics, Ordinary Least Square (OLS) regression analysis is a leading approach. In fact, OLS regression, in its various forms (correlation, multiple regression, ANOVA), is the most common linear model analysis in the social sciences. The method is much easier to work with mathematically and helps draw inferences from the results of various economic and econometric tests. Also, if it can be established that there is a real linear relationship between series and that any deviation from such linear relationship is due to errors that are normally distributed around the estimated value, then OLS is the most appropriate method for analysis. Thus, OLS econometric method was adopted for this study. It employed Granger causality test, as well as cointegration and error correction mechanism techniques for analyses. The test of the pairwise causal relationship between variables, following Granger (1969, 1988), was carried out along three steps: (1) analysis of the time series to determine the order of integration; (2) ascertaining the long run equilibrium relationship among variables of concern; and (3) investigation of the short run as well as the long run causality relationship connecting the variables. The steps are presented in sub-section 4.1 as follows:

4.1 The Preliminary Tests

4.1.1 The Unit Root Test

Many empirical studies which include Nelson and Polser (1982) have claimed that most time series data have unit root, and are non-stationary (see Stock & Watson 1988; and Campbell & Perron 1991). According to Granger and Newbold (1974), conventional regression techniques based on non-stationary time series produce spurious regression, and statistics may simply indicate only correlated trends rather than a true relationship. A spurious regression, however, can be detected in regression model by low Durbin-Watson statistics and relatively moderate coefficient of determination, R^2 . As such, the presence of a unit root in any time series means that the mean and variance are not independent of time. Therefore, in order to test the stationarity of time series, the widely used techniques of Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979, 1981) and Phillips and Perron (PP) (1988) unit root tests were adopted. Essentially, Perron (1989,

1990) had shown that if a time series exhibited stationary fluctuations around a trend, then unit root tests would erroneously conclude that there was a unit root. However, Phillips-Perron and Dickey-Fuller tests have the same asymptotic distributions.

4.1.2 The Cointegration Tests

Ordinarily, while testing for the stationarity of the series, some linear combination of the series may exist such that the non-stationary series with the same order of integration may cointegrate. Hence, in order to test the long run non-stationarity of the series that did not have equilibrium relationship in the short run, the cointegration test was adopted (see Granger and Newbold, 1974, 1977). For such purpose, Engle and Granger (1987) proposed a two-step procedure for cointegration between two time series. First step is the estimation of the cointegration regression of the form in equation (1) by OLS. That is,

$$X_t = \alpha + \beta Y_t + U_t \quad (1)$$

The second step tests whether the residual is stationary. If the test shows that the residuals are stationary, that is, $I(0)$, then X_t and Y_t are cointegrated. That is, the two series have a long run equilibrium relationship. Moreover, according to Granger (1988), the existence of cointegration between two time series indicates the existence of a causality relationship in at least one direction. However, where two time series with large sample sizes are involved, the Engle-Granger procedure is considered to be more appropriate. Yet, in the alternative, the Johansen and Juselius (1990) test is preferable for cointegration among series that are more than two. Therefore, Johansen and Juselius procedure is considered better than Engle-Granger, even in the case of two time series. The procedure has better small sample properties since it allows feedback effects among the variables under investigation unlike in the Engle-Granger procedure where it is assumed that there are no feedback effects between the variables. Also, it is based on likelihood ratio (LR) test to determine the number of cointegration vectors in the regression. In addition, the Johansen technique enables to test for the existence of non-unique cointegration relationships.

Essentially, in the Johansen and Juselius procedure, two tests statistics are suggested for determining the number of cointegration vectors based on likelihood ratio test (LR). These are the trace test and maximum eigenvalues test statistics. The trace test (θ_{trace}) is defined as

$$Trace = -T \sum_{i=r+1}^n \log(1 - \theta_i) \quad (2)$$

The null hypothesis of the trace statistics is that the number of cointegration vectors is $\geq r$ where $r = 0, 1, \text{ or } 2$ against the alternative hypothesis that the number of cointegration vectors = r . The maximum eigenvalues test (θ_{max}) is defined as,

$$\theta_{max} = -T \log(1 - \theta_{r+1}) \quad (3)$$

4.1.3 The Granger Causality and Error Correction Model Tests

After the long run equilibrium of the variables had been established, the short run adjustments were estimated using the error correction model (ECM) which was based on the two following equations:

$$\Delta X_t = a_0 + a_1 e_{t-1} + \sum_{i=1}^m a_i \Delta X_{t-i} + \sum_{j=1}^n a_j \Delta Y_{t-j} + e_t \quad (4)$$

$$\Delta Y_t = \beta_0 + \beta_1 \mu_{t-1} + \sum_{i=1}^m \beta_i \Delta Y_{t-i} + \sum_{j=1}^n \beta_j \Delta X_{t-j} + \mu_t \quad (5)$$

where e_{t-1} and μ_{t-1} represent the error-correction terms which are the lagged residuals from the cointegrating relations. e is the value of the residuals from the regression of x on y using the OLS estimation method and μ is the value of the residuals from the regression of y on x using the OLS estimation method. The error correction terms captures the speed of the short run adjustments toward the long run equilibrium. Furthermore, the error correction model equations in (4) and (5) permit the test for the short run as well as the long run causality between each pair of the variables. According to Engle and Granger (1987), within the ECM formulations, x does not Granger cause y if $\beta_1 = 0$ and $\beta_i = 0$, for all i . Similarly, y does not Granger cause x if $\alpha_1 = 0$ and $\alpha_j = 0$, for all j . The short run causality is based on a standard F-test statistic to test jointly the significance of the coefficients of the explanatory variable in their first differences. The long run causality, on the other hand, is based on a standard t-test. More importantly, the negative and statistically significant values of the coefficients of the error correction terms indicate the existence of long run causality.

4.2 Variable Description and Data Sources

FDI is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the

balance of payments. The series show net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP. It is measured by the cumulative US dollar value of all investments in the home country made directly by residents - primarily companies - of other countries as at the end of the time period considered. Government capital expenditure (general government final capital expenditure as percentage of GDP) is measured by all government expenses that are part of government capital formation. GDP growth rate is annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2000 U.S. dollars. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Trade variable is derived as the ratio of imports plus export to GDP, while the total labour force is used to proxy for labour. All the data are annual series covering the period from 1980 to 2012. Data on government capital expenditure were obtained from the statistical bulletin of the Central Bank of Nigeria (CBN) (2013), while data for real GDP, labour force and trade were collated from the World Bank (2013). Data on FDI were provided by International Monetary Fund (IMF) (2013).

4.3 The Model

Theoretically, apart from the standard Solow-type neoclassical model (see Solow 1956) which suggests that FDI improves economic growth through adding to the capital stock, most micro-based studies (see, for example, Haddad & Harrison, 1993; and Aitken & Harrison 1999) suggest that foreign-owned production is more productive than domestically owned production. This view, based on the models of Grossman and Helpman (1991) and Rivera-Batiz and Romer (1991) underpins the theoretical postulation in the literature. Meanwhile, the endogenous growth theories, in the process of explaining the role of FDI in the long term growth of host countries, Romer (1986, 1987), Lucas (1988, 1990) and Mankiw, Romer and Weil (1992) included growth-driving factors of human capital as well as physical capital to explain the presence of FDI in developing countries (see Lan, 2006). Thus, FDI was a major tool for promoting growth through learning by doing and knowledge spillovers (Balasubramanyam et al 1996) and through multinational corporations (MNCs) (Blomstrom & Kokko, 1998). As such, the Cobb-Douglas production function below in (6) depicts the theoretical interaction in which FDI serves as an additional input.

$$Y_t = A_t K_t^\alpha L_t^\beta F_t^\gamma \quad (6)$$

where Y is output, A is total factor productivity, K is capital, L is labour, and F is FDI. The superscripts are the shares of the respective variables, while t represents time. Taking the natural log of both sides of (6) gives

$$\ln Y_t = \ln A_t + \alpha \ln K_t + \beta \ln L_t + \gamma \ln F_t \quad (7)$$

Following Romer (1990) and Aghion and Howitt (1992), this approach also links FDI flows to the relationship connecting international trade, technological change and growth (see Driffield & Jones 2013). Therefore, linking the approach to trade, since trade impacts significantly on growth in developing countries, the baseline model is specified below as,

$$\ln Y_t = \ln A_t + \alpha \ln K_t + \beta \ln L_t + \gamma \ln F_t + \delta \ln T_t + \varepsilon_t \quad (8)$$

where δ is the share of trade, T , and ε is the error term.

Thus, in order to empirically examine the direct effects of FDI, and government capital expenditure on economic growth in Nigeria, this study toed the line of Le and Suruga (2005b) and Husnain et al (2011) by using the following modified expression in (9) as,

$$\ln Y_t = \alpha_0 + \alpha_1 \ln Gxp_t + \beta \ln L_t + \gamma \ln F_t + \delta \ln T_t + \varepsilon_t \quad (9)$$

The apriori expectation is that $\alpha_1, \beta, \gamma, \delta > 0$.

5. Empirical Results and Discussion

5.1 Stationarity and Cointegration Results

The results of the Augmented Dickey-Fuller (ADF) unit root tests presented in Table 1 showed a strong evidence that all the variables were integrated of order one, that is, $I(1)$. As described in Tables 2 and 3, the results for the cointegration tests suggested that there was three and at least one cointegration equation at the 5 percent level of significance in each of the models, respectively.

Table 1. Augmented Dickey-Fuller unit root test

| Variable | Stage | Critical Value | 1% | 5% | 10% |
|--------------|----------------|----------------|-----------|-----------|-----------|
| <i>LnGdp</i> | 1st Difference | -5.964880 | -2.647120 | -1.952910 | -1.610011 |
| <i>LnGxp</i> | 1st Difference | -9.356430 | -3.644302 | -2.952473 | -2.610211 |
| <i>LnF</i> | 1st Difference | -5.113853 | -2.647120 | -1.952910 | -1.610011 |
| <i>LnT</i> | 1st Difference | -5.171479 | -2.641672 | -1.952066 | -1.610400 |
| <i>LnL</i> | 1st Difference | -5.964880 | -2.664853 | -1.955681 | -1.608793 |

Source: Authors' computation

Table 2. Result of the Johansen cointegration rank test (Trace)

| Hyp. No. | Eigenvalue | Trace Stat | 5% C.V. | Prob. |
|------------|------------|------------|----------|--------|
| $r = 0$ | 0.514721 | 43.26771 | 27.03542 | 0.0053 |
| $r \leq 1$ | 0.375572 | 20.44588 | 13.27533 | 0.0041 |
| $r \leq 2$ | 0.216855 | 6.661422 | 1.784613 | 0.0262 |

Source: Authors' computation

Table 3. Result of the Johansen cointegration rank test (Maximum Eigenvalue)

| Hyp. No. | Eigenvalue | Max-Eigen Stat | 5% C.V. | Prob. |
|------------|------------|----------------|----------|--------|
| $r = 0$ | 0.514721 | 19.43663 | 19.32302 | 0.0451 |
| $r \leq 1$ | 0.375572 | 12.11622 | 12.16627 | 0.0443 |
| $r \leq 2$ | 0.216855 | 6.661422 | 1.784613 | 0.0262 |

Source: Authors' computation

5.2 Granger Causality and ECM Results

As presented in Table 4, the causality relationship between government capital expenditure and growth was bidirectional because both variables Granger caused each other. However, the causality between FDI and growth was unidirectional as growth Granger caused FDI at the 10 per cent level of significance. Specifically, the results revealed that government capital expenditure Granger caused growth at 5 per cent level of significance as against growth Granger causing government capital expenditure at 1 per cent level of significance. The Akaike information criterion (AIC) (Akaike, 1969), amongst others, was used to choose the optimal lag length.

Table 4. Pairwise Granger causality test result

| Null Hypothesis | F-statistic | Probability | Decision |
|--------------------------------|-------------|-------------|----------|
| Gxp does not Granger cause Gdp | 5.22774 | 0.0221 | Reject |
| Gdp does not Granger cause Gxp | 6.48662 | 0.0086 | Reject |
| FDI does not Granger cause Gdp | 0.86045 | 0.0274 | Accept |
| Gdp does not Granger cause FDI | 6.15338 | 0.0545 | Reject |
| FDI does not Granger cause Gxp | 0.89043 | 0.3013 | Accept |
| Gxp does not Granger cause FDI | 0.37756 | 0.5401 | Accept |

Source: Authors' computation.

The validity of the long run relationship between each pair of the variables is implied in Table 5. In the table, the estimated coefficient of the error correction term, ECT(-1) was negative and statistically significant as expected. It showed that the speed of adjustment to equilibrium would require 88 per cent within a year when the variables drifted away from their equilibrium values. This further provided enough evidence that Gdp and Gxp; Gdp and FDI; as well as FDI and Gxp were cointegrated over the period considered. Also, as presented below in the table, the ECM result revealed that FDI

was insignificant to economic growth. However, government expenditure drove economic growth positively at 5 per cent level of significance, while trade impacted on economic growth at 10 per cent level of significance. This implied that a hundred percentage point increase in government expenditure brought about 5 per cent improvement in economic growth. Where as a 2 per cent reduction in economic growth resulted from a hundred percentage point rise in trade openness.

Table 5. The parsimonious (error correction mechanism) model

| Dependent Variable: D(LNGDP) | | | | |
|--------------------------------|--------------|------------|--------------|--------|
| Variable | Coefficient | Std. Error | t. Statistic | Prob. |
| D(LNGXP) | 0.058760 | 0.092158 | 2.09595 | 0.0634 |
| D(LNF) | -0.835449 | 0.506778 | -1.652820 | 0.1106 |
| D(LNT) | -0.022925 | 0.188173 | -2.300678 | 0.0615 |
| ECT(-1) | -0.881120 | 0.191746 | -3.374290 | 0.0013 |
| Adj. R ² : 0.614021 | DW: 1.624506 | | | |

Source: Authors' computation

6. Conclusion and Policy Implication

The relationship among government expenditure, FDI and economic growth in Nigeria has been investigated by this study. It examined if government capital expenditure and FDI influenced economic growth in the country during the period covering 1980 to 2012. The study employed some econometric methods which included OLS, cointegration and Granger causality to ascertain the causal relation between variables, as well as the extent to which one variable impacted on the other. Findings from the analysis revealed that the both of government capital expenditure and growth Granger caused each other, as causality flowed from growth to FDI. However, there was Granger no-causality between government capital expenditure and FDI. Also, it was revealed that government capital expenditure positively influenced economic growth. Therefore, in conclusion, given negative effect of trade openness, FDI was not significant in driving either government capital expenditure or economic growth in Nigeria.

By implication, from the foregoing, as government capital expenditure impacted positively on economic growth, it follows that the government of Nigeria should channel her expenditure more on capital items. Increased capital expenditure on infrastructural projects like power, energy, road, health, education, and commercial agriculture would boost growth and development of the country. Also, given that growth Granger caused FDI, it implies that any growth enhancing policy measure might have a multiplier effect on attracting more FDI into Nigeria.

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