External Sector Aggregates and Economic Growth in Nigeria

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Abstract
This paper empirically examined the effects of selected external sector aggregates on economic growth in Nigeria from 1981 to 2016. Time series data on Real Gross Domestic Product as proxy for economic growth, and on Imports, Exports, Exchange Rate and Foreign Direct Investment were collected from secondary sources. The data sets were analyzed using descriptive statistics, unit root test, co-integration test and error correction technique of model estimation. The result of the analysis revealed that Imports, Exchange Rate and Foreign Direct Investment negatively related with economic growth while Exports positively related with economic growth in Nigeria within the reviewed period. Also, except Exchange Rate all the other explanatory variables – Imports, Exports and Foreign Direct Investment did not impact significantly on economic growth in Nigeria within the period of study. Based on these findings, the study recommends that government should encourage export diversification, especially the non-oil sector exports. This can be achieved through value addition in both the agriculture and manufacturing sub-sectors output.

Key Words: External Sector, Economic Growth, Imports, Exports, Exchange Rate and Foreign Direct Investment.

1. INTRODUCTION

The external sector is one of the most important sectors in the growth and development process of any economy, be it developed or developing. This is because the external sector is a network of economic transactions a country has with other countries. It reflects the economic transactions between the residents of an economy and the rest of the world. An ideal external sector is one that is stable and in equilibrium over time, for this situation ensures sustainable economic growth of a country.

The major indicators of external sector aggregates are balance payments, exchange rate, foreign exchange earnings and external debt. Balance of Payments (BOP) as an indicator of external sector arises from trade interactions between one country and others. This trade not only includes goods and services but also trade in financial assets. Trade provides both foreign exchange earnings and market stimulus for accelerated economic growth. Several countries such as Hong-Kong, South Korea and Singapore have achieved growth through export-led strategy (Tajudeen, 2012).

In line with the above, Obadan and Okojie (2010) pointed out that without tapping into the world market through external trade, Nigeria’s relatively large domestic market can support growth but cannot on its own ensure sustainable growth at the rates needed to make visible impact on development to the country. Therefore, Nigeria has continued to rely on foreign markets.

Historically, the structure of the external sector of Nigeria has remained relatively unchanged since the 1960. For instance, the export sector has been characterized by the dominance of one export commodity (Mordi, Englam and Adebussuyi, 2010). According to them, from the sixteenth century into the nineteenth century, palm oil was the dominant export commodity and later on rubber, timber, cocoa and groundnut were exported. The export of crude oil began in 1958, although it was not the main export at that time. However, in the mid 1970’s, a shift occurred following the oil price shock in the international market, after which crude oil exports dominated the export sector.
Mordi, Englama and Adebusuyi (2010) further stated that during the period between 1970 and 1985, crude oil export accounted for about 93.0 percent in 1986-1998 while the share of non-oil exports declined from an average of 7.0 percent from 1970-1985 to 4.0 percent in 1986 and dropped further to 2.4 percent from 1999-2006. Mordi et al (2010) also observed that the liberalization of trade and exchange regimes in 1986 did not impact much on the non-oil export performance, even though the non-oil sector expanded slowly, many traditional export disappeared such as palm oil, groundnut, ginger and hides and skins.

Arising from the above, the Nigerian government launched the home-grown development strategy, namely the National Economic Empowerment and Development Strategy (NEEDS) complemented by SEEDS and LEEDS, the country was able to dialogue and get the debt relief deal which allowed the country to exit from all its Paris club debt obligations from 2004-2005 followed by exit from its London club debt obligations in 2006.

The fluctuations in the external sector also caused instability in the economy’s growth rate. Odida and Nurudeen (2010) asserted that GDP growth averaged approximately 6.0 percent in the period from 1971 to 1980. This was due to the millions of dollars Nigeria made from the oil boom during this period. However, the fall in oil prices which began in 1981 had negative effect on the growth of output. Growth of GDP averaged -5.82 percent in the period 1981-1985. The adoption of the Structural Adjustment Program (SAP) of 1986 however seemed to impact positively on the economy as the negative growth rate was reversed. For instance; the GDP grew at an average of 4.03 percent in the period 1986-1998 (Odida and Nurudeen, 2010). They further noted that the return of Nigeria to democracy has further strengthened the growth rate of the output as it averaged 5.71 percent during 1999-2008.

From the above discussion, it seems that the performance of the external sector of Nigeria affects the economic growth of the country. And as no economy can operate in isolation but constantly interact with the rest of the world. Interaction such as trade, acts as catalyst for growth. Nigeria being part of the world should not be an exemption. Therefore, there is need to evaluate the impact of the external sector aggregates on the Nigeria’s economic growth. This is the main motivation for this study.

2. LITERATURE REVIEW

Very few studies have examined the impact of external sector aggregates on economic growth of countries. Most of the reviewed works looked at foreign trade and economic growth, imports and economic growth, export and economic growth, and so on. For instance; Azeez, Dada and Aluko (2014) examined the effect of international trade on the economic growth of Nigeria in the 21st century from 2000 to 2012. The study adopted the Ordinary Least Square (OLS) estimation technique. The study revealed that international trade has a significant positive impact on economic growth. Imports, Exports, and Trade Openness have significant effect on the economy. The study recommends that government should reduce over-dependence on oil exports; increase and diversify its export base to earn more revenue.

Arodoye and Iyoha (2014) examined the nexus between foreign trade and economic growth in Nigeria using quarterly time-series data from the first quarter of 1981 to the fourth quarter of 2010. The study employed vector autoregressive modeling technique for the analysis. The study found that there is a stable, long-run relationship between foreign trade and economic growth. The study therefore recommends adoption of trade expansion policies as means of accelerating economic growth in Nigeria.

Adeleke, Olowe and Fasesin (2014) analyzed the impact of foreign direct investment on Nigeria economic growth from 1999 to 2013. The study employed the Ordinary Least Square (OLS) estimation technique for the analysis. The result of the analysis revealed that economic growth is directly related to inflow of foreign direct investment and it is also statistically significant at 5% level.

Uwakaeme (2015) examined the major economic growth determinants as well as the direction of causality that exists between economic growth and some selected economic growth indicators in Nigeria, employing the Johansen Co-integration and Granger Causality tests for a period spanning 1980 to 2012. The study found that impact of trade openness, although positive, is not quite impressive as reflected in the size of its regression coefficient in part. Also, inflation and excessive Government fiscal deficit showed significant inverse relationship with economic growth,
implying that they constitute impediment to the growth of the economy. Furthermore, the granger causality result showed a birichtional relationship amongst the variables.

Saaed and Hussain (2015) investigated the impact of exports and imports on the economic growth of Tunis from 1977 to 2012. The study used Granger Causality and Johansen Cointegration approaches for the analysis. The study found that economic growth was found to Granger Cause import and export was found to Granger Cause import. Also, the Johansen Cointegration result showed that there is a long run relationship amongst the variables.

Adelye, Adetine and Adewuyi (2015) examined the impact of international trade on economic growth in Nigeria from 1985 to 2012. The study employed regression analysis as the method of analysis using co-integration and error correction modeling techniques to analyze the relationship. The study found that Total Export (TEX) remains positive and significant while others remain insignificant, which means, Nigeria is running a monocultural economy where only oil is the driver of the economy.

Hamdan (2016) used panel data to examine the effect of exports and imports on economic growth in the Arab countries from 1995 to 2013. The study found that the effect of exports and imports were positive on economic growth in the Arab countries. The study recommended it is important indicator for measuring the efficiency and effectiveness of the work element in achieving certain level of output in the production process. There is need to increase the imports of technology for increasing labour productivity which can directly promote economic growth, and thus improve the standards of living in the Arab countries.

Bakari (2016) investigated the relationship between exports, imports, and economic growth in Canada between 1990 and 2015. The study used Johansen co-integration analysis of Vector Auto Regression Model and the Granger-Causality tests to analyze the data. The result of the analysis found that there is no relationship between exports, imports and economic growth in Canada. It also found that there is a strong evidence of bidirectional causality from imports to economic growth and from exports to economic growth. These results provided evidence that exports and imports are sources of economic growth in Canada.

Lawal and Ezeuchenne (2017) examined the impact of international trade on economic growth in Nigeria from 1985 to 2015 with the use of Johansen Co-integration and Vector Error Correction Model (VECM) techniques to analyze the data. The results showed that the variables under study are co-integrated. Also, the VECM result showed that both export and balance of trade are significant in explaining growth of the Nigerian economy. While the reverse is the case for import and trade openness. Therefore, the study recommends that government should increase her exportation of finished goods and reduce importation of finished goods to increase economic growth.

2.1 Summary of Reviewed Literature and Research Gap
From the literature reviewed, it was observed that only a few studies have examined the effect of external sector aggregates on economic growth of countries, most of the works reviewed looked at foreign trade and economic growth, imports and economic growth, export and economic growth, and so on. For instance, Bakari (2016) investigated the relationship between exports, imports and economic growth in Canada; Hamdan (2016) focused on the effects of exports and imports on economic growth in the Arab countries; Bakari and Mabrouki (2017) investigated the relationship between exports, imports and economic growth in Panama while Lawal and Ezeuchenne (2017) examined the impact of international trade on economic growth in Nigeria. None of these studies have examined the effect of external sector aggregates on economic growth in Nigeria using import (IMP), export (XPT), exchange rate (EXR) and foreign direct investment (FDI) from 1981 to 2016 in a single study. Apart from the choice of these variables none of these studies have anchored on Grossman-Helpman’s Model of Growth-Cum-Trade for the model. This is the identified gap this study has targeted to fill.

3. METHODOLOGY

3.1 Theoretical Analysis and the Model
The study employed Grossman-Helpman’s Model of Growth-Cum-Trade which envisaged that both technology and foreign trade can be engaged in an endogenous manner which in turn will lead to growth. Grossman and Helpman...
(1991) extended the constant return to capital, or AK growth model of Paul Romer (1986 and 1989) and Robert Lucas (1988) to include trade as a major determinant of growth. Thus, the model is specified as:

\[ Y_t = f(AK^{1-\alpha}T^\alpha) \]  

(1)

Where; \(Y_t\) = Output growth rate, \(A\) = Index of Technology, \(K\) = Private Capital, \(T\) = Trade, \(1-\alpha\) = Share of Private Capital, \(\alpha\) = Share of trade

For the purpose of this study, equation (1) is written in an intensive form as:

\[ Y_t = f(T^\alpha) \]  

(2)

Where; \(Y_t\) = Output growth rate and \(T\) = Trade

In equation (2), Trade (T) is composed of trade of both import (IMP) and export (XPT). The study also included exchange rate (EXR) and foreign direct investment (FDI) as major variables for external sector aggregates. Thus;

\[ T = (IMP^\theta, XPT^\omega, EXR^\phi, FDI^\psi) \]  

(3)

Substituting equation (3) into equation (2), we obtain

\[ Y_t = f(A, IMP^\theta, XPT^\omega, EXR^\phi, FDI^\psi) \]  

(4)

Econometrically, equation (4) is specified as:

\[ RGDP_t = A (IMP)^{\Phi_1} (XPT)^{\Phi_2} (EXR)^{\Phi_3} (FDI)^{\Phi_4} \mu_1 \]  

(5)

Equation (5) is transformed into a log-linear form as follows:

\[ \log(RGDP_t) = \log(A_t) + \Phi_1 \log(IMP) + \Phi_2 \log(XPT) + \Phi_3 \log(EXR) + \Phi_4 \log(FDI) + \log(\mu_1) \]  

(6)

Equation (6) is re-written as:

\[ \log(RGDP_t) = \Phi_0 + \Phi_1 \log(IMP) + \Phi_2 \log(XPT) + \Phi_3 \log(EXR) + \Phi_4 \log(FDI) + \epsilon_t \]  

(7)

From equation (7), \(\log(A_t)\) is represented by \(\Phi_0\) and \(\log(Y_t)\) is represented by \(RGDP_t\).

\[ RGDP = \text{Real Gross Domestic Product}, \ IMP = \text{Import}, \ XPT = \text{Export}, \ EXR = \text{Exchange Rate} \text{ and } FDI = \text{Foreign Direct Investment}. \]  

Thus, a priori expectations are \(\Phi_1, \Phi_2, \Phi_3, \text{and} \Phi_4 > 0\).

3.2 Data Set and Estimation Techniques

The study used data on Real GDP, Imports (IMP), Exports (XPT), Exchange Rate (EXR) and Foreign Direct Investment (FDI). These data were gathered from various issues of Central Bank of Nigeria statistical bulletin between the periods 1981 to 2016. Thereafter, the data were analyzed using co-integration and Error Correction Mechanism (ECM) estimation techniques.

4. RESULTS AND DISCUSSION

4.1 Descriptive Statistics

Table 1 presents the summaries of the descriptive statistics for the variables used in this study. It shows the mean, medium, maximum, minimum and standard deviation values etc.
Table 1: Descriptive Statistics

<table>
<thead>
<tr>
<th>Variables</th>
<th>LNRGDP</th>
<th>LNIMP</th>
<th>LNXPT</th>
<th>LNEXR</th>
<th>LNFDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>10.2232</td>
<td>6.106847</td>
<td>6.521620</td>
<td>3.293778</td>
<td>5.393288</td>
</tr>
<tr>
<td>Median</td>
<td>10.01642</td>
<td>6.750000</td>
<td>7.150819</td>
<td>3.811330</td>
<td>5.032374</td>
</tr>
<tr>
<td>Minimum</td>
<td>9.330920</td>
<td>1.791759</td>
<td>2.014903</td>
<td>-0.494296</td>
<td>1.323860</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>0.535484</td>
<td>2.587903</td>
<td>2.656756</td>
<td>1.947662</td>
<td>2.947175</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.443419</td>
<td>-0.346173</td>
<td>-0.464193</td>
<td>-0.735479</td>
<td>0.266907</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.774803</td>
<td>1.698423</td>
<td>1.788235</td>
<td>2.202203</td>
<td>1.625031</td>
</tr>
<tr>
<td>Jarque-Bera</td>
<td>3.431385</td>
<td>3.260169</td>
<td>3.495413</td>
<td>4.200297</td>
<td>3.263244</td>
</tr>
<tr>
<td>Probability</td>
<td>0.179839</td>
<td>0.195913</td>
<td>0.174173</td>
<td>0.122438</td>
<td>0.195612</td>
</tr>
<tr>
<td>Sum</td>
<td>367.9317</td>
<td>219.8465</td>
<td>234.7783</td>
<td>118.5760</td>
<td>194.1584</td>
</tr>
<tr>
<td>Observations</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
<td>36</td>
</tr>
</tbody>
</table>

Source: Authors’ Computation (from E-view 9)

From Table 1, the result of the descriptive statistics showed that, the standard deviation calculated for foreign direct investment was the most volatile in the series with a value of 2.94 while RGDP was the least volatile variable with a value of 0.535. The calculated values for the skewness statistics values of IMP, XPT and EXR variables were negatively skewed, suggesting that their distributions have a long left tail while the skewness statistics value for RGDP and FDI variables were positively skewed, suggesting that their distributions have a long right tail. Again, the kurtosis statistics of all the variables were platykurtic, suggesting that their distributions were flat relative to normal distribution. Based on these observations, it therefore means that there is unit root (non-stationarity) in the series. Thus, estimating these variables at level might not give good results, hence, the need to conduct the unit root test.

4.2 Unit Root Test

This involves testing for the stationarity properties of the individual variables using the Augmented Dickey Fuller (ADF) test to find the existence of unit root in each of the time series. The results of the unit root test using the ADF are presented in Table 2 below.

Table 2: Unit Root Test Results

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>5% Critical Values</th>
<th>1st Diff.</th>
<th>5% Critical Values</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>LNRGDP</td>
<td>0.097324</td>
<td>-2.951125</td>
<td>-3.229346</td>
<td>-2.951125</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNIMP</td>
<td>-0.717627</td>
<td>-2.948404</td>
<td>-5.147951</td>
<td>-2.951125</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNXPT</td>
<td>-1.301130</td>
<td>-2.948404</td>
<td>-6.068471</td>
<td>-2.951125</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNEXR</td>
<td>-1.934273</td>
<td>-2.948404</td>
<td>-5.022240</td>
<td>-2.951125</td>
<td>I(1)</td>
</tr>
<tr>
<td>LNFDI</td>
<td>-0.011321</td>
<td>-2.948404</td>
<td>-5.337376</td>
<td>-2.951125</td>
<td>I(1)</td>
</tr>
</tbody>
</table>

Source: Authors’ Computation (from E-view 9)

From Table 2 above, the results of the variables showed that all the variables were found stationary at 1st difference. This is because in absolute term, the ADF value of each of the variable is greater than the critical value at 5%. Since the variables are stationary at order one, the next step is to conduct the co-integration test using the Johansen procedure as demonstrated in the table below.

4.3 The Co-integration Test

The results of the co-integration test using the Johansen procedure are presented in Table 3 below.
Table 3: Johansen Co-integration Test Results

<table>
<thead>
<tr>
<th>Eigen value</th>
<th>Trace Stat</th>
<th>5% critical value</th>
<th>Eigen value</th>
<th>Max-Eigen Stat</th>
<th>5% critical value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.65269</td>
<td>79.7084</td>
<td>69.81889</td>
<td>0.652693</td>
<td>35.95655</td>
<td>33.87687</td>
</tr>
<tr>
<td>0.47366</td>
<td>43.7519</td>
<td>47.85613</td>
<td>0.473664</td>
<td>21.82171</td>
<td>27.58434</td>
</tr>
<tr>
<td>0.28814</td>
<td>10.3742</td>
<td>15.49707</td>
<td>0.288146</td>
<td>11.55600</td>
<td>21.13162</td>
</tr>
<tr>
<td>0.23002</td>
<td>0.887572</td>
<td>8.887572</td>
<td></td>
<td>14.26460</td>
<td></td>
</tr>
<tr>
<td>0.04278</td>
<td>1.48665</td>
<td>3.841466</td>
<td></td>
<td>3.841466</td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ Computation (from E-view 9)

The result of the co-integration in Table 3 was based on both the Trace Statistics and Maximum Eigenvalue. The results indicated one co-integrating equation for both the Trace Statistics and Maximum Eigenvalue at 5 percent level. This suggests that there is a co-integration, that is, a long run relationship existed between the variables in the RGDP model.

4.4 Parsimonious ECM Test Result

In order to confirm the existence of a co-integrating vector among the variables, the ECM is employed. This is based on the general-to-specific rule and the results are presented on Table 4 below.

Table 4: Parsimonious ECM Result

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Coefficient</td>
<td>Std.Error</td>
<td>t-Statistic</td>
</tr>
<tr>
<td>C</td>
<td>0.023455</td>
<td>0.010472</td>
<td>2.239791</td>
</tr>
<tr>
<td>D(LNWRGDP(-1))</td>
<td>0.635526</td>
<td>0.156479</td>
<td>4.061421</td>
</tr>
<tr>
<td>D(LNIMP)</td>
<td>-0.007500</td>
<td>0.020303</td>
<td>-0.369401</td>
</tr>
<tr>
<td>D(LNIMP)</td>
<td>0.023324</td>
<td>0.016510</td>
<td>1.412698</td>
</tr>
<tr>
<td>D(LNEXR)</td>
<td>-0.056788</td>
<td>0.021644</td>
<td>-2.623716</td>
</tr>
<tr>
<td>D(LNFDI)</td>
<td>-0.004888</td>
<td>0.013552</td>
<td>-0.360681</td>
</tr>
<tr>
<td>ECM(-1)</td>
<td>-0.213348</td>
<td>0.099943</td>
<td>-2.134693</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.458383</td>
<td>Mean dependent var</td>
<td>0.044454</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.338024</td>
<td>S.D. dependent var</td>
<td>0.042327</td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>0.034438</td>
<td>Akaike info criterion</td>
<td>-3.718055</td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>0.032022</td>
<td>Schwarz criterion</td>
<td>-3.403805</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>70.20694</td>
<td>Hannan-Quinn criter.</td>
<td>-3.610887</td>
</tr>
<tr>
<td>F-statistic</td>
<td>3.808453</td>
<td>Durbin-Watson stat</td>
<td>1.970990</td>
</tr>
<tr>
<td>Prob(F-statistic)</td>
<td>0.007050</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Authors’ Computation (from E-view 9)

From Table 4 above, the result of the analysis showed that the regressors in the model accounted for about 46 percent of the total variation in the RGDP. The remaining 54 percent were due to factors exogenous to the model but covered by the error term. Also, the overall regression result of the dynamic model is significant at 5 percent level as shown by the F-calculated of about 3.808 which is greater than the F-table of 2.69. The ECM is rightly signed and is also significant. It shows about 21 percent disequilibrium in RGDP in the previous year (since the data are annual) is corrected in the current year. However, the DW value of about 1.971 suggests the absence of autocorrelation in the model.

Also, from Table 4, the coefficient of Import (IMP) is -0.0075, suggesting that a unit increase in Import (IMP) reduces real GDP (RGDP) by about 0.008 percent. The coefficient of IMP did not impact significantly on RGDP at 5 percent level.
percent level in Nigeria within the period under review. This finding agreed with the works of Adeleye et al (2015), Lawal and Ezeucheme (2017) and more. This result could be due to the country’s economic reality that more of consumption goods than productive capital goods are often been imported thus, not contributing sufficiently to the economy’s real output.

The coefficient of Export (XPT) is 0.023324, meaning that a unit increase in XPT increased RGDP by about 0.023 percent. The coefficient of XPT is not statistically significant with RGDP within the period of study. This finding supports the works of Velnampy and Achuthan (2013), Azeez et al (2014), Adeleye et al (2015) and Lawal and Ezeucheme (2017). Though exports have great potential to drive real output, it has contributed below expectations. This outcome may be due to the general and specific structural imbalances in the economy, evident in overdependence on crude petroleum export, a sector which value chain has not been adequately or even not explored at all.

The coefficient of Exchange Rate (EXR) is -0.056788, suggesting that one Naira depreciation in EXR reduced RGDP by about 0.057 percent, but the coefficient of EXR is statistically significant with RGDP at 5 percent level. The result of this study corroborate with the works of Akeem (2011), Erhieyovwe and Jimoh (2011), Oladipupo and Otonamiyohuwo (2011), Atah-Obeng, Enu, Osei-Gyimah and Opoku (2013) and Ethinomen and Da'silva (2014). This outcome may be due to the reality that among others, Nigeria is a consuming nation that imports more of consumption goods than capital goods, and the capital goods sub-sector of the economy is inactive to satisfy the needs of local investors, coupled with multiplicity of exchange rates which the Central Bank of Nigeria is recently working to unify.

The coefficient of Foreign Direct Investment (FDI) is -0.004888, meaning that a unit increase in FDI decreased RGDP by about 0.005 percent. The coefficient of FDI is not statistically significant with RGDP within the period of study. The negative and insignificant effect of FDI on economic growth in Nigeria within the period under review could in line with other scholars, who has said that though FDI raises the level of investment and perhaps the productivity of investments as well as the consumption in the host country, it lowers the rate of growth due to factor price distortions or misallocations of resources. This finding supports previous studies such as Olokoyo (2012), Erhieyovwe and Jimoh (2012), Olusanya (2013), Adelowokan and Maku (2013) and Enu, Havi and Hagan (2013). This result may be predicated on the obvious fact that FDI inflow to Nigeria is relatively more to the oil and gas sector that is dominated by huge foreign resources and foreigners, and the end result is massive repatriation of returns on investments which inversely impacts on aggregate real output in the face of poorly performing non-oil sector.

4.5 Diagnostic Test Results and Analysis

The researcher also conducted a post estimation diagnostic test to ascertain whether or not the series are free from autocorrelation (Breusch-Godfrey Serial Correlation LM Test), heteroscedasticity (Breusch-Pegan-Godfrey Test), normality problem (Jarque-Bera Statistics). The result of the diagnostic test is presented in Table 5 below.

<table>
<thead>
<tr>
<th>Test</th>
<th>Results</th>
<th>Prob. Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jarque-Bera</td>
<td>0.247450</td>
<td>0.883623</td>
</tr>
<tr>
<td>Breusch-Godfrey Serial Correlation LM Test</td>
<td>F-Stat = 0.628155 Obs*R² = 1.626829</td>
<td>0.4433</td>
</tr>
<tr>
<td>Breusch-Pagan-Godfrey Test</td>
<td>F-Stat = 0.440929 Obs*R² = 3.034161</td>
<td>0.8045</td>
</tr>
</tbody>
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The result of the normality test using Jarque-Bera test revealed that the Jarque-Bera value is 0.247450 while the probability value is 0.883623. This value is about 88 percent which is higher than the 5 percent (0.05), hence, the study therefore confirmed that model one is normally distributed.
The study also showed the result of the autocorrelation test using Breusch-Godfrey Serial Correlation LM method. It showed that the F-statistics is 0.628155, observed *R is 1.626829, Chi-Square probability value is 0.4433. This indicated that the probability value of about 44 percent (0.4433) is greater than 5 percent (0.05) critical value; hence confirmed no serial correlation in the model.

Again, the result of the heteroscedasticity test using Breusch-Pegan-Godfrey test showed the F-statistics is 0.440929, Obs*R² is 3.034161, while the Chi-Square probability value is 0.8045. This suggested that there is no evidence of heteroskedasticity in the model since the Chi-square probability value of about 80 percent is more than 5 percent (p>0.05). So, residuals do have constant variance which is desirable in regression meaning that residuals are Homoscedastic.

Also, the stability of the parameters of the model is examined using the plots of the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residual (CUSUMSQ). Instability of the parameters arises due to structural changes and the institution of different policy regimes over the sample period. Whilst the CUSUM test is particularly useful for detecting systematic changes in the regression coefficients, the CUSUMSQ test is significant in situations where the departure from the constancy of the regression coefficients is haphazard and sudden. If any of the straight lines in the graph is crossed, the null hypothesis that the regression equation is correctly specified is rejected at the 5 percent level of significance. From Figures 1 and 2 both the CUSUM and CUSUMSQ stayed within the 5 percent critical line, indicating parameter constancy throughout the sampled period of this study.

![Figure 1: Stability Test Result based on CUSUM](image1.png)

![Figure 2: Stability Test Result based on CUSUMSQ](image2.png)
5. CONCLUSION AND POLICY RECOMMENDATIONS

The study examined empirically the effects of selected external sector aggregates on economic growth in Nigeria between 1981 and 2016. Time series data were collected from secondary sources on Real GDP (RGDP) a proxy for economic growth, Imports (IMP), Exports (XPT), Exchange Rate (EXR) and Foreign Direct Investment (FDI). The data set was analyzed using descriptive statistics, Unit root Test, co-integration and error correction mechanism (ECM) technique of analysis to estimate the model. The results of the analyses revealed that IMP, EXR and FDI were negatively related with economic growth while XPT was positively related with economic growth in Nigeria within the period reviewed. Also, except EXR all the other variables – IMP, XPT and FDI did not impact significantly on economic growth in Nigeria within the period of study.

The study therefore suggests that:

(i) Private investors should be encouraged to import more productive capital goods for diversified production while the government makes frantic efforts to transform the country’s capital goods industry to satisfy local demands.

(ii) The government should encourage export diversification especially the non-oil sector exports. This can be achieved through value addition to both the agriculture and manufacturing sub-sectors output.

(iii) Export promotion strategy such as Export Incentives -Export Development Fund, Export Expansion Grant Fund and Tax Relief on Interest income should be reviewed so that export will change its dimension.

(iv) There should be stable exchange rate management policy that avoids over-valuation or excessive depreciation of the Naira and ensures international competitiveness of tradable goods, relative price stability as well as avoiding inconsistent fiscal policies.

(v) The government should encourage FDI inflows by offering tax incentives, infrastructural development, import duty exemptions and other measures to attract FDI so as to boost more diversified economic growth.

REFERENCES


