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# An ARDL Approach to the Government Expenditure and Economic Growth Nexus in Nigeria

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## Abstract

This study majorly aims at investigating the impact of government expenditure on economic growth by controlling FDI inflow as additional variable for the timeframe from 1981 to 2016. The inclusion of FDI inflow in the model become imperative because government spending policies especially in areas such as infrastructure play significant role in attracting potential investors (inflow of FDI) as closely linked to the work of Cristina, (2012) and Adeoye, (2007). Thus, the linear combination of these key macroeconomic variables is expected to drive economic growth appropriately. The traditional ADF and PP unit root tests were employed for the stationarity tests of the series in which both show a mixed order of  $I(1)$  and  $I(0)$ . The dynamic ARDL test found that the variables in view equate in the long term at the speed of 30% and at 1% level of freedom. The findings further show that government expenditure asserts significant positive impact on economic growth both in the short-long run, while FDI effect is positive but insignificant in both terms. Furthermore, the pairwise granger causality revealed a unidirectional link which flows from economic growth to government expenditure in support of the Wagner's law for the Nigeria economy, and a one way feedback from FDI to government expenditure, while a divergent interaction was revealed between FDI and economic growth. This study therefore suggests a possible way out which is to pursue a strong and disciplined fiscal policy where her hard earned resources would be channel majorly to the productive sector with high returns and to ensure close monitoring. Finally, this study suggests that government should first focus on improving the absorptive capacity of the economy which will help trigger the spillover effects of FDI inflow into productive gains.

## Key words

Government expenditure, FDI, economic growth, time series, ARDL, Nigeria

**JEL Codes:** C22, F43, F3, H50

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## 1. Introduction

Generally, government expenditure is widely seen as a panacea for economic growth particularly in the case of the developing economies where government is an indispensable factor in the workings of the economy. According to Keynes (1936), the government either directly or indirectly controls the working of the economy by its spending policies, providing some free services, goods etc to the citizens which tally with the work of Alexious, (2009) and Wu *et al.*, (2010). Again, Keynesians are of the view that, government could reverse a case of economic recession by raising revenue or by indulging in a domestic borrowing and re-circulating it through different spending programs. The multiplier effect is the rising demand from consumption which will stimulate investment, thus, causing the economy to move along the expansionary path for the endogenous growth models such as Barro (1990) submitted that government expenditure becomes an influencer of economic growth only if it is channel toward the productive sector of the economy. However, government expenditure can be disaggregated broadly into two; recurrent and capital expenditures. Spending on projects such as roads, Education, electricity are refers to as capital expenditure, whereas, expenditures on administration, wage, salaries, public debt servicing, and gratuities are classified as recurrent expenditure. Wagner's law differs from the above; stating that government expenditure is spurs by economic growth in line with the study of Usman *et al.*, (2016) in the case of Nigeria. This therefore mean that economic growth form the aim of public spending. Furthermore, FDI inflow is responsive to government expenditure in some sensitive areas such as infrastructure development, security as backed by Goodspeed *et al.* (2011) Thus, confirming the reality of the subject matter.

In the case of Nigeria, particularly after the return of democracy in 1999, the annual spending (budget) of the government had been on the high side on yearly basis. The increase in government expenditure suddenly takes geometric steps spinning from millions to billions and now running in trillions. However, it is pertinent to know that, despite the huge annual public expenditure being indulged by the Nigeria government, the growth rate of the GDP in Nigeria still depict a gloomy picture and continues to fluctuate and had never for once attain the desired peak. Besides, the main concern here is that the living standard of the citizens during the period in-view particularly from 1999, have rather been deteriorating drastically, characterized with poor infrastructure needed to carry out commercial activities, poor standard of education, and high level

of unemployment, poverty and inequality. Does that mean that the government had not been committing her hard earned resources into the productive sector of the economy to bring about the desired growth and improvement in the welfare of her citizens? Therefore, the frivolous spending by the Nigeria authority without a proportionate growth rates spur the need to carry out this study to investigate the subject matter from 1981 to 2016. Secondly, to the best of the author knowledge, no study has use government expenditure in its aggregated form to investigate the government expenditure and economic growth nexus in the case of Nigeria. Most of the studies disaggregated government expenditure into capital and recurrent expenditures, while other deal with government expenditure on the sectorial basis which may not show its aggregate impact on the economy as a whole. Thirdly, no study has incorporated FDI inflow into the econometric model in an attempt to investigating the subject matter at hand in the case of Nigeria. It is important to point out here that government consumption spending in areas such as infrastructure development, human capital development, security, etc. could attract inflow of FDI into the country in line with the submission made by Goodspeed *et al.* (2011) and Anyawun, (2011). In similar study, Cristina, (2012) submitted that government policies is a stimulant for FDI inflow into the host country aligning with the work of Adeoye, (2007). Adeoye found that macroeconomic corporate governance largely explain FDI inflow into the host country. While a significant FDI inflow to the country could influence economic growth through its spillover effect aligning with the work of Gungor and Katirlioglu, (2010). The economic intuition here is that holding all things been constant, FDI inflow (external factor) and government expenditure (domestic factor) are major macroeconomic variables for which their linear combination is expected to stimulate economic growth either independently or simultaneously. Therefore, this study is not a prototype in the case of Nigeria, but unique in scope in an attempt to bridge these three gaps stated above thereby contributing to the existence body of knowledge accordingly. Furthermore, this study is equally timely as it will serve as a road map that will guide the policy maker in Nigeria and other emerging economies toward formulating sound macroeconomic policies that will help to guide government on when and how to expand and direct her spending into meaningful economic activities in order to serve the purpose of promoting economic growth.

## 2. Literature review

The debate for or against the view that government expenditure is a promoter of economic growth had generated significant attention among scholars till date. Some scholars lent their supports, while others questioned it reality. However, the arguments whether in support or not are mostly built upon two popular theories propounded by Wagner (1883) and Keynes (1936) respectively. In 1883, Wagner offered a model to explain his stand as regard the subject matter. He came out with an empirical conclusion from his findings which tagged economic growth as a key driver of government expenditure. He further explain that what measures how much government expenditure contributes to GDP is the level of economic development; that is a progressive economic development will cause government expenditure to contribute positively to the GDP and vice versa. On the contrary, Keynes, (1936) during the great depression asserts that economic growth is a normal phenomenon resulting from government spending. He sees government spending as a critical tool in correcting imbalance in the economy, for which the result product is growth in productivity. In his work Landau (1983) reveals that government consumption expenditure exerts an unfavourable impact on productivity. The work of Wu *et al.* (2010) discovered that government spending is a stimulant of economic growth most especially in the higher and medium income economies except for the lower income nations. The study of Alexious, (2009) carry out on seven emerging economies reveal that government expenditure is a tool capable of expanding the productive strength of an economy. The study of Nworji *et al.*, (2012) shows a mix revelation of the interaction between government expenditure on economic growth for most of the sectors capture except for economic services aligning with the work of Nurudeen and Usman (2010). Oluwatobi and Ogunrinola, (2011) submit that government recurrent expenditure on human capital development promotes real output favourably, while capital expenditure demonstrate an inverse correlated with the real output. MuritalaTaiwo, (2011) reveals in his findings that both capital and recurrent components of government expenditure significantly explaining economic growth in Nigeria. Usman *et al.* (2016) found a revelation similar to that of MuritalaTaiwo (2011). Besides, they found a one way causal relationship flowing from economic growth to capital expenditure and from recurrent expenditure to economic growth; implying economic growth is driver of capital expenditure, while recurrent expenditure promotes growth. Adigun (2017) discovered that government spending via human capital development and capital/investment expenditure are both stimulants of economic growth in the long run. Kaur and Afifa (2017) though revealed a mixed outcome, still confirm the Wagner law. They further submit an evidence of a mutual causality linking government spending and economic growth in the case of Indian economy. The findings of Oyinola and Akinnibosun (2013) also confirm the Wagner's law stressing that government spending is undertaken deliberately to foster productivity. Aremu *et al.* (2015) submit empirically that only government spending channel towards the agriculture sector stimulates economic growth. The work of Odinakachi *et al.* (2015) reveals a bidirectional causal link between government expenditure and GDP. The study of Kolawale, (2016) which considered government spending on some sectors found that only government spending directed towards health sector induces inclusive growth. The work of Babalola *et al.* (2015) reveal a mixed results and that government sectorial spending

influence economic growth more during the civilians' regime than the military regime Ifaramiji (2017) also found a mixed result as revealed by the by Babalola *et al.* (2015). Chipaumire (2014) and Zhang and Zou (1998) reveal that government spending is non-promoter of economic growth at all in the case of South Africa aligning the Wagner's law. According to Devarajan *et al.* (1996) government current expenditure stimulates economic growth positively while capital expenditure does not. Landau, (1983) discovered from his study that government consumption expenditure stimulate growth process negatively.

On the other hand, the debate on FDI-led growth hypothesis is an old one, which is mostly base on the premise of Modernization and the Dependency principles. The modernization theory is of the view that growth process is endogenous which is achievable with a well-developed human capital coupled with technological progress. According to Pradhan and Kumar (2002) the availability of an improved human capital development, Market opportunities for investors, know-how, capital and technology are natural consequences of FDI inflow. While Dependency theory view FDI inflow as an instrument adopted by the developed countries to exploits the developing economies, thereby enforcing the dependency level which tally with study of Adams S, (2009). He found that domestic investment suffers crowding out effect orchestrated by FDI inflow. According to Cristina, (2012), Adeoye, (2007) and goodspeed, (2011) government spending policies is a key player in causing inward FDI to the recipient economy. Borensztein *et al.* (1998) revealed that the impact of FDI inflow on economic growth depend largely on the absorptive capacity of the host economy. The work of Sunde, (2017) and Tshepo, (2014) reveal a that FDI inflow demonstrate a one way causal effect on economic growth. Abbes *et al.* (2015) and Nistor, (2014) maintained that inward FDI spurs economic growth as indicated in their respective areas of studies. The studies of Lee (2013) and Shahbaz and Rahman (2013) revealed that FDI inflow is in no doubt a promoter of economic growth. Abdouli and Hammami (2017) submit that the impact of FDI inflow on economic growth is country-specific in the case of the MENA economies. Agrawa (2014) findings reveals that inward FDI and GDP drive each other accordingly; implying bidirectional causality. Pandya and Sisombat (2017) and Mehic *et al.* (2013) results revealed that FDI contribute significantly and positively to economic growth. Claassen *et al.* (2011) and Carike (2012) reveal that FDI and economic growth exhibit feedback stimulation on each other. Mah, (2010) and Khobai *et al.* (2017) discovers an opposing view which claim that inflow FDI is not contributing factor to the growth process in the china's economy. This aligns with the work of Bezuidenhout (2009) who submitted that the contribution of FDI inflow to the growth process of an economy is a mere presumption.

### 2.1. The Nigeria Economy at a Glance

As an emerging economy, Nigeria has the highest population in the continent of Africa and 8<sup>th</sup> in the world. Before the oil boom of the 1970s the country had been depending on agriculture sector as the largest contributor to the GDP growth rate as well as her major exports commodity. However, after the oil boom, the oil industry takes the dominance of the economy to the negligent of the agriculture sector till date. The oil sector, particularly the natural gas has been the key driver of the economy. Nigeria occupies the 17<sup>th</sup> position in ascending order as a producer of natural gas in the world as well as the 2<sup>nd</sup> largest in Africa after Algeria. She is also ranked the 13<sup>th</sup> largest oil producer in the world, and first in Africa respectively, CIA world fact book (2018). Although the government had make several attempts through various program to revive the agriculture sector as a way of diversifying the economy, like Fadama II and III projects, yet without any significant result. In 2009, the banking sector suffers a setback as the government through the Central Bank was forced to embark on the recapitalization of the banking sector due mainly to the spillover effect of the financial crises that rocked the global village between 2008 and 2009. Beyond this period, agriculture, telecommunication and service have been contributing significantly to economic growth, while Nigeria industry output was ranked the third largest in Africa next to South Africa.

Unfortunately, the effect of the strong economic growth recorded during this period has not transcended to improving the standard of living of the expectant citizens as about 62% out of the 170 million total populations are wallowing in abject poverty. Furthermore, the country is characterized with high level of unemployment, inequality and poverty which are the natural product of underdevelopment. The drive to attract new investors suffers setback due to the negative perspective of the international community about Nigeria as regards the high level of corruption and insecurity especially in recent time. In addition to the factors mentioned above, lack of infrastructure, shortage of power supply, political unrest, vandalism of gas pipeline by the militants in the Niger-Delta due to perceived injustice and government negligence of the communities in the oil region, sharp fall in agriculture produce as a result of ethnic and religious crises particularly between farmers and herdsmen in the most recent time are militating against the level of economic progress of the country. Interestingly, Nigeria economy is the gate way of FDI that flows to the continent of Africa. For instance, in 2011, the inflow of FDI into Nigeria stood at \$8.92-billion higher than South Africa which achieved \$5.81-billion as the second largest in the continent, World Investment Report by the UN Conference on Trade and Development (UNCTAD, 2012). In summary, the latest GDP composition by estimation consists of: agriculture 21.6%, industry 18.3% and service 61.1% in 2017.

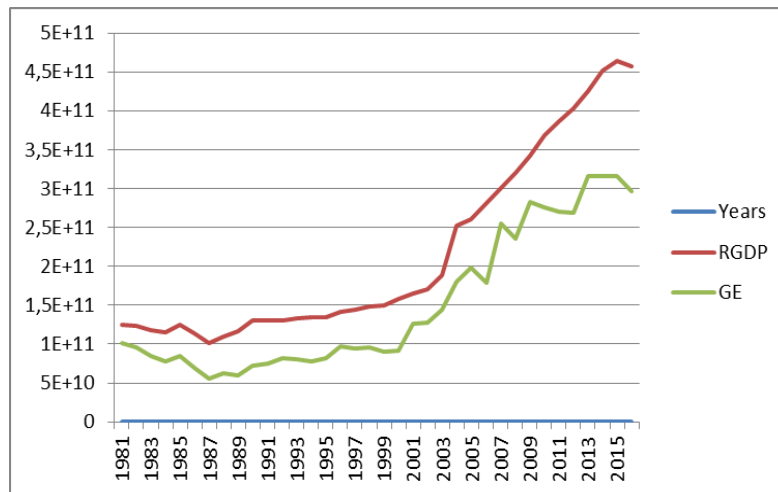


Figure 1. Trend of Government Expenditure and Gross Domestic Product from 1981 to 2016

### 3. Methodology of research

Following the aim of this study in an attempt to investigate the nexus between government expenditure and economic growth, data were extracted from the World Bank data bank ranging from 1981 to 2016. The variables used include, final government expenditure as constant, 2010 in dollars, FDI as net inflow (% of GDP), and GDP (constant 2010 in US\$) as proxy for economic growth which are all converted to natural log in order to achieve growth effect. Thus, the variables in view are used to form a linear econometric model as follows:

$$\text{GDP} = f(\text{GE}, \text{FDP}) \quad (1)$$

$$Y_t = X$$

It is imperative to state here that for the sake of space the empirical equations and procedures are not stated. However the study employed majorly the dynamics ARDL bound test to carry out this study.

### 4. Analysis of the empirical results

This section presents the empirical discoveries of this study, which include the unit root tests, ARDL bonds test, and Granger Causality test. This study relies on the traditional Dickey-Fuller (ADF), Phillip-person (PP) to determine whether or not the variable of interest stationary. For cointegration analysis coupled with the short-long run analysis, the dynamic ARDL bounds test was employed, while the Pairwise Granger test was undertaken to find out the causal relationship between the variables of interest.

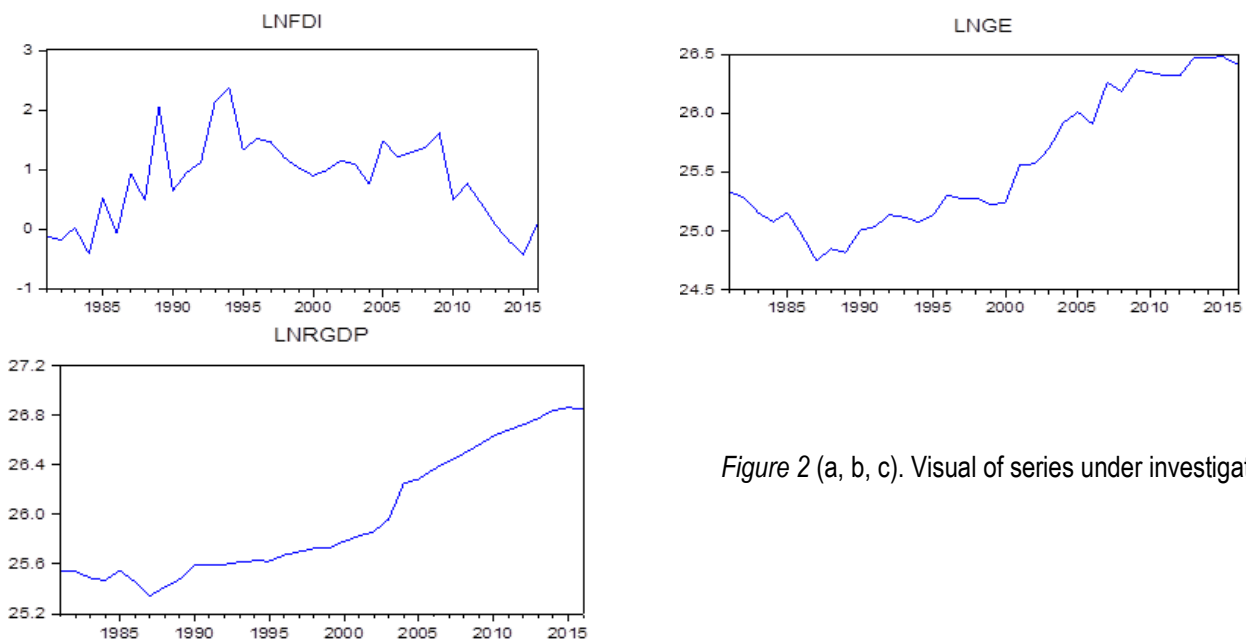


Figure 2 (a, b, c). Visual of series under investigation

Table 1. Summary Statistics

	LNRGDP	LNGE	LNFDI
Mean	25.971	25.571	25.571
Median	25.728	25.294	25.294
Maximum	26.864	26.481	26.481
Minimum	25.342	24.748	24.748
Std. Dev	0.508	0.576	0.576
Skewness	0.594	0.402	0.402
Kurtosis	1.764	1.629	1.629
Jarque-Bera	4.406	3.791	3.791
Probability	0.111	0.150	0.150
Sum	934.947	920.540	920.540
Sum Sq. Dev.	9.016	11.627	11.628
Observations	36	36	36

**Source:** Author computation. LNRGDP; Natural Log of real Gross Domestic Product, LNGE; Natural Log of Government Expenditure, LNFDI; Natural Log of Foreign Direct Investment.

The empirical result from table 1 above indicates that GDP has a larger average as against the other variables. It is closely observed that each is dispersed from its means as indicated by the value of the standard deviation. Interestingly, all the variable were positively skewed. The Jarque-Bera revealed that series are normally distributed.

Table 2. Correlation coefficient matrix analysis

Observations	LNRGDP	LNGE	LNFDI
LNRGDP	1.000		
t-stat	-----		
p-value	-----		
No. of obs.	36		
LNGE	0.981	1.000	
t-stat	29.679	-----	
p-value	0.000	-----	
No. of obs.	36	36	
LNFDI	-0.191	-0.217	1.000
t-stat	-1.132	-1.299	-----
p-value	0.266	0.202	-----
No of obs.	36	36	36

**Source:** Author computation. GDP; Gross Domestic Product, GE; Government Expenditure FDI; Foreign Direct Investment.

The person coefficient correlation (Table 2) reveals the mutual relationship between the series. The matrix shows significant positive interaction between GDP and the government expenditure which is empirically true. On the contrary, the relation between FDI and GDP is negative and insignificant as same goes between FDI and government expenditure. This proves that the external factor of FDI has negative influence on the domestic variable of GDP and government expenditure.

Table 3. ADF and PP tests of Unit Root

Statistic (Level)	GDP	GE	FDI
$t_{\tau}$ (ADF)	-2.285	-2.878	-2.671
$t_{\mu}$ (ADF)	1.225	0.131	-2.755*
$t$ (ADF)	3.348	1.422	-1.618
$t_{\tau}$ (PP)	-2.269	-2.926	-2.538
$t_{\mu}$ (PP)	1.057	0.773	-2.656*
$t$ (PP)	3.348	1.422	-1.618*
Statistic (First difference)			
$t_{\tau}$ (ADF)	-4.651***	-6.574***	-10.397***
$t_{\mu}$ (ADF)	-4.337***	-6.270***	-9.900***
$t$ (ADF)	-3.543***	-5.932***	-10.055***
$t_{\tau}$ (PP)	-4.608***	-6.564***	-30.162***
$t_{\mu}$ (PP)	-4.324***	-6.253***	-9.875***
$t$ (PP)	-3.477***	-5.965***	-10.029***

**Note:**\*, \*\* and \*\*\* denote rejection of the null hypothesis at the 1 percent, 5 percent and 10 percent levels respectively. Tests for unit roots have been carried out in E-Views 9.0.

Table 3 represents the results of the traditional ADF and PP. The findings reveal a different order of integration between the series. At level, ADF test shows that only FDI is stationary at 1% level of significance, but at first difference variables became stationary given 1% level of significance. Similarly, at level PP results indicates only FDI is stationary at 1% degree of significant, while at first differencing, all variable turn out to be stationary at 1% level of significant. Thus, this study employed the dynamic ARDL approach.

Table 4. ARDL Bounds test

Test stat	Value	K
F-stat	4.7826	2
<b>Critical Value Bounds</b>		
significance	I(0) Bounds	I(1) Bounds
10%	263	3.35
5%	3.10	3.87
2.5%	3.55	4.38
1%	3.13	5

**Source:** Author computation, 2018

Table 4 above represents the bounds testing to cointegration between the variable of interest. We reject the null hypothesis at 10%, 5%, 2.5% level of significance respectively, thus conclude that there is a long run relationship between the variables in view.

Table 5. ARDL result  $GDP=f(DFI, TO, INDTR, URB)$

Variables	Coefficient	SE	t-statistic	P-Value
<b>Short run</b>				
GE	0.294***	0.066	4.419	0.000
FDI	0.016	0.012	1.311	0.199
ECT	-0.306***	0.079	-3.848	0.000
<b>Long run</b>				
GE	0.963***	0.063	15.052	0.000
FDI	0.055	0.046	1.199	0.239
<b>Diagnostic Tests</b>				
Tests	F-statistic	Prob. Value		
$\chi^2$ NORMAL	7.083	0.0289		
$\chi^2$ SERIAL	0.137	0.872		
$\chi^2$ WHITE	2.649	0.397		
$\chi^2$ RAMSEY	0.858	0.397		

ARDL; Autoregressive distribution lag model, ECT; Error correction term, SE; standard error, GDP; Gross Domestic Product, GE; Government Expenditure, FID; Foreign Direct Investment.

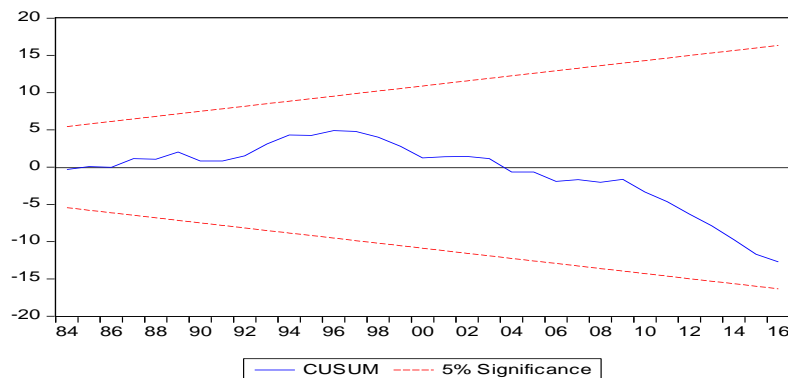


Figure 3. Plot of cumulative sum of Recursive Residuals showing stability

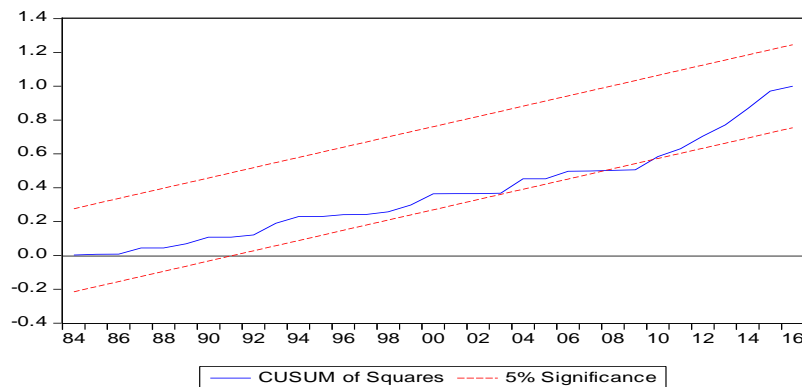


Figure 4: Plot of cumulative Sum of Squares of Recursive Residuals which indicates stability.

Table 5 represents the short-long run analysis. The results indicate evidence of a long run convergence between the variables under consideration. The widely known ECT indicate negative value of -0.3062 and is statistically significant at 1% level of freedom accounting for 30% rate at which economic growth adjust towards the path of convergence on a yearly basis. The study proves that the impact of government expenditure on economic growth in the short run is positive and statistically significant at one 1% level of significance, implying that for every one percent increase in government spending, GDP grow by 0.29% equivalent. The case is similar with the long run. In the long run, government spending promotes economic growth positively and statistically significant at 1% level of significance. About 0.96% increase in GDP is linked to 1% increase in government expenditure. The relationship between FDI and economic growth though shows positive but statistically insignificant both at short-long run. It follow that for every 1% increase in FDI inflow into Nigeria, GDP increase by only 0.0169% and 0.0555% in both short-long run respectively. The second part of Table 6 contains the results of the diagnostic tests of the model showing that the model is normally distributed, well specified and is homoscedastic in nature. Also, the Ramsey reset test, CUSUM and CUSUM of square (CUSUMsq) statistic tests were carried out as present in figure 3 and 4 above, all confirming the stability of the model.

Table 6. Granger causality test

Null hypothesis	F-statistic	Causality	Prob.
GE does not Granger cause GDP	0.108	GDP → GE	0.897
GDP does not Granger cause GE	3.795		0.034
FDI does not Granger cause GDP	1.657	GDP ≠ FDI	0.208
GDP does not Granger cause FDI	2.255		0.123
FDI does not Granger cause GE	3.054	FDI → GE	0.063
GE does not Granger cause FDI	2.368		0.112

Source: Author compilation

Table 6 above represents the empirical outcome of the dynamic granger causality test which revealed a one way causal link flowing from economic growth to government expenditure, thus, confirming the Wagner's law. The implication is that economic growth is the dynamic driver of government expenditure. On the other hand, the study reveals a diverging interplay linking economic growth and inward FDI aligning with the work of Bezuidenhout (2009) who believe that the ideal behind the spillover effect of FDI inflow on economic advancement is a fallacy. Finally, this current study proves that there exists a unidirectional causal flow running from FDI inflow to government expenditure, implying that the FDI inflow into Nigeria increase the financial responsibility of the government probably in expanding the absorptive capacity.

## 5. Conclusions and recommendations

This study focuses on investigating the government spending and economic growth nexus, by controlling FDI inflow as an additional variable which makes the study unique from the previous ones. The empirical investigation begins with the stationarity tests for which the ADF and PP techniques were employed. The results revealed both  $I(1)$  and  $I(0)$  orders of integration between the variable of interest from both techniques. Secondly, the study examines the long term equilibrium relationship via the ARDL bounds testing and found that the divergent in the short run is corrected along the long-run path as the variables of interest eventually converged. The empirical findings further show an evidence of both short and long run positive and significant link between economic growth and government spending. Whereas, FDI inflow promotes economic growth positive both in the short run and long term though insignificantly. However, for the direction of causation



this study relies on pair wise Granger causality which reveals a unidirectional causality flowing from economic growth to government spending; implying that economic growth is the driver of government expenditure in the case of Nigeria which tally with the Wagner's law (1983), and empirical evidence from the work of Usman *et al.* (2016). This study further revealed that inward FDI and economic growth hypothesis is a mere presumption for the Nigeria economy, as also view by Shahbaz and Rahman, (2012) for Pakistan. This contradicts the study of Güngör and Ringim (2017) for Nigeria. The difference in the empirical evidence may not be unconnected with the variables included in the econometric model in addition to the scope of the study.

In respect to the findings, this study hereby suggests that government should take precaution in expanding her annual budget which must be channel mainly to the productive sector of the economy with high returns. This includes agriculture, industry and investment/capital projects which exhibit direct impact on the growth process. Most importantly, because of the perceived high level of corruption in Nigeria, government should apply disciplined fiscal policy that will discourage reckless spending and mismanagement of her hard earned resources, and to also monitor closely the disbursement of the annual budget and ensures that they are been directed into the purported meaningful economic activities as stated in her blue print. In addition, the government should embark on building the absorptive capacity of the country in order to attract new foreign investors via fiscal programs such as reforming her educational system for better human capital development, removing trade barriers, improvement in infrastructure development, tax exemption, and particularly ensuring peaceful environment and/or fighting corruption to the barest minimum which are the two main factors threatening the attraction of new investors into the economy in the most recent time.

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