The Influence of External Sector Variables on Econimic Growth in Nigeria.

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Abstract

The paper empirically examined the relationship between external sector variables such as: exchange rate, trade openness, direct foreign investment, world oil price, world gross domestic product and economic growth in Nigeria using the annual time series data spanning from 1981 to 2018 by employing the Autoregressive Distributed Lags (ARDL) Model application to cointegration and Error Correction Model techniques known as Bounds Testing. Unit root test was conducted on all the variables of interest in the study. The study finds evidence that direct foreign investment, trade openness, exchange rate, world oil price and world gross domestic product have a significant impact on economic growth in Nigeria. In addition, the study reveals that there is long run relationship among direct foreign investment, trade openness, exchange rate, world oil price, world gross domestic product and economic growth in Nigeria. These findings are useful in designing macroeconomic policies and framework in explaining the relationship between external sector variables and economic growth in Nigeria. In view of the findings of the study, it is hereby recommended that policy makers and economic planners should consider a holistic approach in designing macroeconomic policies and framework in explaining the relationship among external sector variables such as: direct foreign investment, trade openness, exchange rate, world oil price, world gross domestic product and economic growth in Nigeria.

Keywords: Direct foreign investment, Trade openness, Exchange rate, World oil price, World gross domestic product, Economic growth.

JEL Classification: E5, E52, E58, E62, E63.

1. Introduction

In an open economy, economic stability is a function of the interplay of various factors and sectors in an economy, one of which is the external sector. The external sector can be in a state of stability or instability. Mordi et al (2010) opined that balance of Payments (BOP) accounts, currency Exchange Rate (EXR) and External Debt (EXD), Foreign Exchange Earnings, Exports, Imports, Foreign Portfolio Investment (FPI) and Foreign Direct Investment (FDI) are the indicators of external sector performance. Nwaeze (2017) asserts that the volatility in oil prices (which are determined externally) and outputs have led to uncertainties and shocks in government revenues. This has also introduced instability in both economic growth and inflation in Nigeria, given that the Nigerian economy is predicated on external sector performances in the form of oils exports and importations (import dependent economy). Therefore, there is no gain saying the fact that the external sector of an economy not only mirrors the relative strength of an economy. This has prompted some economists and policy makers to advocate for adoption of import-substitution and export-led policies or models to grow economies and mitigate against macroeconomic instability.

Some of the major problems that have hindered the attainment of economic stability (increase in economic growth and low inflation rate) have been attributed to external sector aggregates such as: balance of payment disequilibrium, exchange rate volatility and excessive reliance by the federal government on external borrowing from the banking system, particularly the World Bank and the International Monetary Fund (IMF) to finance its large and unsustainable fiscal deficits. In addition, fluctuation in Nigeria currency exchange rate, which is a component of the external sector variables, caused economic instability in the country (Nwaeze,2017).

Within macroeconomic models, different techniques have been employed in the modeling of the external sector arising from theoretical underpinnings, accounting systems and definition of variables (Matlanyane, 2005). In principle, the estimation of the external sector should reflect trade flows, services flows, transfers as well as direct and portfolio capital flows (Pauly, 2000). Su Dinh, Nguyen and Christophe (2019) are of the view that inward FDI with trade openness has a substitute effect on the economic growth while they have a positive impact on economic growth. In the same vein, Bishnu (2012) found that FDI to be an important factor in explaining the changes in exports both in the short run and long-run.

A number of studies and literature exist on the effect of external sector variables on economic stability. For instance, Wacziarg (2001), and Sinha and Sinha (2000) found that the growth rate of GDP is positively related to the growth rate of trade openness. In fact, Liu et al. (2002b) showed that there exist co-integration and bidirectional causality among FDI, trade and economic growth in China while Szkorupová (2014) confirmed the existence of causal links between FDI, exports and economic growth in Slovakia. However,

Dritsaki and Stiakakis (2014) found that the link between exports and economic growth is significant whereas inward FDI is an insignificant effect on the economic growth in Croatia. In the same vein, Belloumi (2014) showed that there is no evidence for the existence of bidirectional causality among FDI, trade and growth in Tunisia. Hsiao and Hsiao (2006) found significant differences in the causal relationships between these variables. In relation to Asian economies, Goh et al. (2017) opined that there does not exist long run co-integration between FDI, exports and growth. The interpretation of the link between trade and FDI is also a matter of debates: the relationship between these variables is either complementary or substitute. In the light of this, Marchant et al. (2002) found a complementary relationship between FDI and exports in East Asian developing countries. Fontagné (1999) and Wilson and Cacho (2007) also concluded that trade and FDI have a complementary relationship in the OECD countries. Taking a cursory at look at the significant and dynamic of impact of foreign direct investment (FDI) and trade on the economic growth, Makki (2004) provided evidence that FDI and trade have a positive effect on the economic growth.

Taking cognizance of the absorptive capacity of countries, Aizenman and Noy (2006) affirmed that the link between foreign direct investment and trade is stronger in developing countries than in developed countries. It is worth noting that a positive relationship between FDI and trade hinges on low trade and financial constraints in developing countries. In contrast, Ponce (2006) found that the relationship between the degree of FDI and trade is inconclusive in Latin America. Countries that signed more free trade treaties increased their potential capacity in attracting FDI inflows.

Interestingly, the growth effect of FDI interacting with trade and domestic investment is positive. Nath (2009a) affirms that export-oriented trade policy enhances the growth effect of FDI for these countries. Awan et al. (2012) revealed positive effects of exports and FDI on the economic growth for South Asian countries. Alternatively, some studies show that FDI and trade negatively impact economic growth due to limitations related to country-specific factors such as institutions, trade regime, political risk, human capital and policy (Fortanier, 2007b, de Mello, 1999a, Farshid et al., 2009b, Xu, 2000). Furthermore, Goh et al. (2017) found that the long-run relationship between FDI and trade does not exist in some Asian countries. These results contrast with previous works claiming that the Asian economic miracle mainly depends on an outward-looking strategy implemented by these countries.

From another perspective, Nwaeze (2017) confirms the weakness of key external sector variable in driving economic activities in Nigeria and highlights the unique case of underutilized fund from abroad and causal effect of exchange rate is found to be positive and significant in the long run and short run. Thirdly, the causal effect of FDI is found to be negative and insignificant on economic growth but exerts positive and significant effect on inflation suggesting the dominant role of FDI in driving macroeconomic stability in

Nigeria and concludes that external sector variables exert mixed causal effects on macroeconomic stability in Nigeria.

Empirically, different methods and variables have been adapted to model the external sector in the past which might have culminated into lack of consensus over the relationship between direct foreign investment, trade openness, exchange rate and economic growth. From the works aforementioned, it is worth noting that none investigated the impact of world oil price and world gross domestic product in moderating the growth effects of direct foreign investment, trade openness and exchange rate in an emerging economy such as Nigeria. The quest to have a more articulated and better knowledge of the workings of the external sector and its relationship with economic growth in developing economy like Nigeria has warranted this study. This study therefore investigates the significant and long run relationship between external sector variables and economic growth in Nigeria spanning from 1981 to2019. In the light of the missing knowledge gap identified, the study intends to examine the in-depth relationship existing among direct foreign investment, trade openness, exchange rate, world oil price, world gross domestic product and economic growth in Nigeria.

2. Theoretical Framework

2.2.1 The Two-Gap Model of Development

The two-gap model was postulated by two theorists, Harrod (1939) and Domar (1946) and their theory is regarded as a post Keynesian growth model for closed economies. The major component of the model states that most countries are underdeveloped either because they are faced with a shortage of domestic savings to augment for investment opportunity or they are faced with foreign exchange constraints to finance the needed capital and international goods. The model therefore, introduces the assumption that an imported commodity not produced domestically is essential for the production of investment goods. The model is represented thus:

$Y = C + I + (X-M)$ …….. (2.1);

where (X-M) equals to net export.

Equation (2.1) can be rearranged as $Y + M = C + I + X$…… . (2.2)

Thus, sources of income in the economy = uses of resources in the economy.

Equation (2.2) can be broken down further to $S + C + M = C + I + X$ ……. (2.3)

Subtracting C from both sides and defining savings (S= Y-C),

$S + M = I + X$ …… (2.4)

The two-gap model is then represented by $M - X = I - S$ …….. (2.5)

(Foreign exchange gap) = (Savings gap).

In essence therefore, the model states that if the available domestic savings fall short of the level necessary to achieve the target rate of growth, a savings-investment gap is said to exist. And to close this gap requires Foreign Direct Investment (FDI); so also, if the maximum import requirement needed to achieve the growth target are greater than

the maximum possible level of export, this is a situation of high importation which will lead to a shortfall in the foreign exchange. This creates the trade gap which can be corrected by foreign aid. Despite the plausible contribution of this model. However, the model is not immune to some weaknesses, as it focuses exclusively on the savings-investment gap to achieve growth. By not considering the performance of the external sector of the borrower's economy, the model is silent on this transformation problem being a close economy growth model. The significance of this theory to this study is that the model promotes domestic savings as a condition to achieving a target rate of growth. It also affirmed that the external sector plays a pivotal role in economic growth and/or development trajectory of any given economy, as it could be used to bridge the domestic savings-investment gap through Foreign Direct Investment, foreign exchange and foreign aid while maintaining external stability (Abdullahi et al, 2013),

3. Methodology

The model in this study incorporates more external sector indicators in order to investigate the significant relationship between external sector variables and economic growth in Nigeria. The functional model to be estimated is stated as:

GDP01 = F (EXR, TOP, DFI, WOP, WGDP) ……. (3.1)

The linear form of the models is stated thus;

$GDP01_t = \alpha_0 + \alpha_1 EXR_t + \alpha_2 TOP_t + \alpha_3 DFI_t + \alpha_4 WOP_t + \alpha_5 WGDP_t + U_t$ …… (3.2)

Where;

GDP01 = Gross domestic product used as proxy for Economic growth
EXR= Exchange rate
TOP= Trade openness
DFI= Direct Foreign Investment
WOP = World oil price
WGDP = World Gross domestic product
U = Error Term
t = Time Frame
α_0 = Autonomous components of economic growth
α_1- α_5 = Coefficient of the independent variables

Sources of Data

The relevant data for the study were sourced from the publications of the Central Bank of Nigeria (CBN) statistical bulletin.

Estimation Techniques

Unit Root Test

The stochastic characteristics of each time series will be tested at levels for stationary in this study by considering their order of integration using Phillip-Perron unit root test since most macroeconomic time series variables have unit roots and regressing non stationary variables in the model might lead to spurious regression results (Granger, 1969).

Autoregressive Distributed Lag (ARDL) Approach to co-integration Test

This study employs the autoregressive distributed lag or Bounds testing approach to co-integration (ARDL) proposed by Peasaran, Shine and Smith (2001) to investigate the linear empirical model specified in equation 3.2. Other co-integration techniques require all the variables to be integrated of the same order, ARDL test procedure provides valid results whether the variables are I (0) or I (1) or mutually co-integrated, allows for simultaneous testing of the long and short-run relationships between the variables in a time series model and provides very efficient and consistent test results in small and large sample sizes. The procedure will however crash in the presence of 1(2) series. The implementation of the ARDL test for Equation (3.2) involves the estimation of the following model:

$GDP01t = \beta 0 + \beta 1GDP01t - 1 + \beta 2EXRt - 1 + \beta 3TOPt - 1 + \beta 4DFIt - 1 + \beta 5WOP_{t-1} + \beta 6WGDP_{t-1} + \square_t$ ----------3.3

Where GDP01t, EXRt,TOPt, DFIt,WOPt and WGDPt are stationary variables and □t is a white noise.

The final step is to obtain the error of the short-run dynamic elasticities by estimating an error correction model associated with the long run estimates. This is specified as follows:

$\Delta GDP01t = C + \sum \Pi \Delta GDP01t - 1 + \sum \Omega \Delta EXRt - 1 + \sum \mu \Delta TOPt - 1 + \sum \phi \Delta DFIt - 1 + \sum \delta \Delta WOPt - 1 + \sum \square \Delta WGDPt - 1 + \lambda ECM \sum t - 1$ ---------- 3.4

The symbols $\Pi, \Omega, \mu, \phi, \delta$ and □ are the short run dynamic elasticities of the model's convergence to long run equilibrium and λ is the speed of adjustment. Δ represents the first difference operator and ECM_{t-1} is the one period lagged error correction term. $\Delta GDP01t$ is the change in current gross domestic product, $\Delta GDP01t$ t $-_1$ is the change in previous gross domestic product, EXR_{t-1} is the lagged exchange rate, $\Delta TOP\ t - 1$ is the lagged trade openness, $\Delta DFIt - 1$ is the lagged direct foreign investment, $\Delta WOPt - 1$ is the lagged world oil price and $\Delta WGDPt - 1$ is the lagged world gross domestic product.

4. Results And Discussion

4.1 Results

Testing the Stationarity of the Series using Unit Root Test

Table 1: Phillip-Perron Unit Root Test

Series	At Levels		1st Difference		Level of Integration
	Statistics Probability		Statistics Probability		
GDP01	1.0000	0.5752	0.0288	0.0000	1(1)
DFI	0.0254	0.5752	-	-	1(0)
EXR	0.9984	0.5752	0.0024	0.0000	1(1)
TOP	0.3318	0.5752	0.0000	0.0000	1(1)

WOP	0.6357	0.5752	0.0004	0.0000	1(1)
WGDP	0.9985	0.5752	0.0009	0.0000	1(1)

Source: Author's computation (2020)

The result in Table 1 confirms that DFI is stationary at level while GDP01, EXR, TOP, WOP and WGDP are integrated of order one which indicates that the condition for Johansen cointegration is not met. Therefore, the Bounds Testing (or Autoregressive distributed lag (ARDL) cointegration procedure is adopted.

Testing the Long-run relationship Among the Series

Table 2: Co-integration Test based on Bound Test for GDP01

F- Statistic	3.870445	
K	5	
Level of Significance	I(0) Bound	I(1) Bound
10%	1.81	2.93
5%	-1.95	-3.83
1%	2.82	4.21

Source: Author's Computation (2020)

This result in Table 2 indicates the rejection of the null hypothesis of no cointegration between the dependent variable (GDP01) and all the explanatory variables in the model implying that the estimated model for Economic growth establishes that the fact that a valid long-run relationship is found in the bound test. This is because the F-statistic value of 3.870445 is greater than the critical values at both the lower bound (1.95) and upper bound (3.83) using 5% significant level. Based on this, the study confirms that there is evidence of a long-run relationship existing among economic growth (GDP), direct foreign investment (DFI), exchange rate (EXR), trade openness (TOP), world oil price (WOP) and world gross domestic product in Nigeria.

Table 3: Estimated Long-run coefficients using ARDL Technique

Variable	Coefficient	Std. Error	T-Statistic	Prob.
GDP01	-0.727032	0.263630	-2.757770	0.0154
DFI	-1836.227	882.9734	-2.079595	0.0564
EXR	30.31470	28.09598	1.078970	0.2988
TOP	-96683.77	34896.54	-2.770583	0.0150
WOP	-655.6905	226.8597	-2.890290	0.0119
WGDP	1.93E-09	6.61E-10	2.914528	0.0113
R-squared	0.996518	Mean dependent var	34695.03	
Adjusted R-squared	0.992289	S.D. dependent var	43915.59	

S.E. of regression	3856.258	Akaike info criterion	19.65110	
Sum squared resid	2.08E+08	Schwarz criterion	20.47558	
Log likelihood	-296.4177	Hannan-Quinn criter.	19.92439	
Durbin-Watson stat	1.622347			

Source: Source: Author's Computation (2020)

The estimated long-run coefficients for ARDL model in Table 3 confirms that in the long-run, Direct foreign investment (DFI) at 2.08 t-statistic value has a negative impact on economic growth (GDP01) in Nigeria. Furthermore, Exchange rate (EXR) at 1.08 t-statistic was found to have a positive and significant impact on economic growth (GDP01) in Nigeria at 5% level of significance. In addition, Trade openness (TOP) at 2.77 t-statistic has a negative and significant impact on economic growth (GDP01) in Nigeria at 5% level of significance while World oil price (WOP) at 2.89 t-statistic has a negative and significant impact on economic growth (GDP01) in Nigeria at 5% level of significance and World Gross Domestic Product (WGDP) at 2.91 t-statistic has a positive and significant impact on economic growth (GDP01) in Nigeria at 5% level of significance.

The Short-run Dynamic Relationship among the Series

Table 4: Short-run Dynamic Relationship among the Series using ARDL Error Correction Regression

ARDL Error Correction Regression				
Dependent Variable: D(GDP01)				
Selected Model: ARDL(4, 0, 1, 3, 2, 3)				
Sample: 1981-2018				
Included observations: 32				
ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP01(-1))	0.383756	0.197295	1.945091	0.0721
D(GDP01(-2))	0.258681	0.181530	1.425003	0.1761
D(GDP01(-3))	-0.219316	0.153400	-1.429697	0.1747
D(EXR)	-83.97275	41.18147	-2.039091	0.0608
D(TOP)	-47358.34	12487.72	-3.792394	0.0020
D(TOP(-1))	24126.99	10473.69	2.303581	0.0371
D(TOP(-2))	17416.47	8063.437	2.159931	0.0486
D(WOP)	-509.9870	105.9971	-4.811329	0.0003
D(WOP(-1))	237.0569	105.6472	2.243855	0.0415
D(WGDP)	2.51E-09	7.91E-10	3.171194	0.0068
D(WGDP(-1))	2.87E-10	5.97E-10	0.479730	0.6388

D(WGDP(-2))	1.33E-09	4.11E-10	3.243262	0.0059
CointEq(-1)*	-0.727032	0.129504	-5.613954	0.0001
R-squared	0.839200	Mean dependent var	4500.555	
Adjusted R-squared	0.737642	S.D. dependent var	6462.581	
S.E. of regression	3310.193	Akaike info criterion	19.33860	
Sum squared resid	2.08E+08	Schwarz criterion	19.93406	
Log likelihood	-296.4177	Hannan-Quinn criter.	19.53598	
Durbin-Watson stat	1.622347			

Source: Author's Computation (2020)

Table 4 confirms the error correction term is well defined since it is negative and statistically significant at 5% significant level which further affirms the presence of long-run relationship between economic growth and all the independent variables in Nigeria. The coefficient is -0.727032 which implies that about 73% of any disequilibrium in GDP01 is corrected by the explanatory variables within one period (one year). This also shows the speed at which the model converges to equilibrium

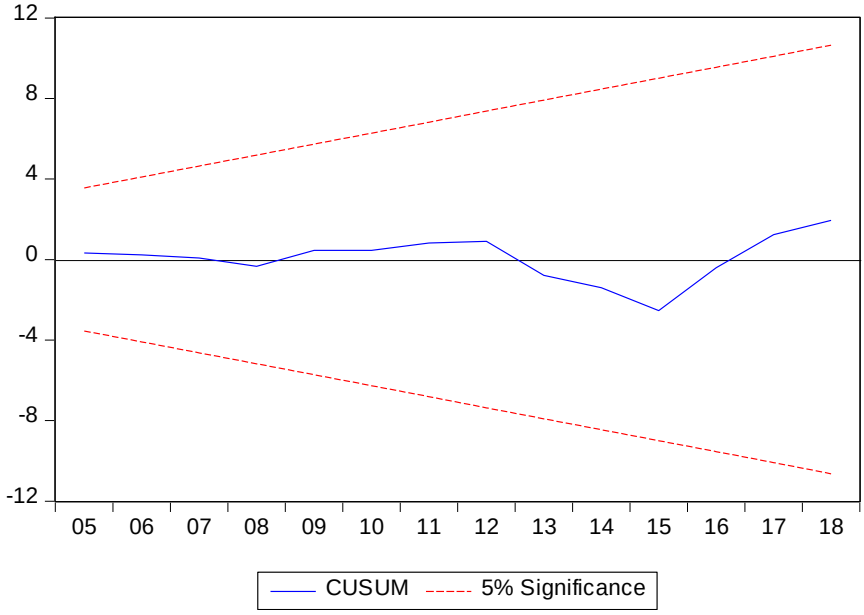
Testing for Structural Stability

In order to test for the stability of the model used in this paper, we applied the recursive test and cumulative sum of the recursive residuals (CUSUM) according to Brown, Durbin and Evans (1975). The test finds parameters instability if the plots of the Recursive test and cumulative sum of the recursive residuals (CUSUM) go outside the area between the two critical lines. The plots are shown in figures 1 and 2 below:

Fig. 1: Recursive Test for Structural Stability of the Parameters



Fig. 2: CUSUM Test for Structural Stability of the Parameters



As shown in fig 1 and fig 2 the results are suggestive of coefficient stability since the plots did not move outside the 5% critical bound. This confirms the existence of coefficient stability for the estimated parameters for the short run dynamics and long run of growth function over the sample periods as the results indicate tendency of further coefficients stability. One can conclude that the model is well estimated and the observed data fit the model specification adequately, hence the coefficients are valid for policy discussions in Nigeria.

4.2 Discussion of Findings

Direct foreign investment has a significant and dynamic impact on economic growth in Nigeria. In the same vein, exchange rate has a significant and dynamic impact on economic growth in Nigeria. In contrast, trade openness has a significant impact on economic growth in Nigeria. This result is in congruence with Sakyi and Egyir (2017) who found that the interaction between DFI and trade enhances the growth. In contrast, some studies show that FDI and trade negatively impact economic growth due to limitations related to country-specific factors (Fortanier, 2007b, de Mello, 1999a, Farshid et al., 2009b, Xu, 2000). In the same vein, world oil price has a significant and dynamic impact on economic growth in Nigeria. World gross domestic product also has a significant and dynamic impact on economic growth in Nigeria. In a nutshell, the study confirms that there is evidence of a long-run relationship existing among economic growth (GDP), direct foreign investment (DFI), Exchange rate (EXR), trade openness (TOP), World oil price (WOP) and World gross domestic product in Nigeria.

5. Conclusion

The findings of the study show that direct foreign investment and trade openness have a significant impact on economic growth in Nigeria. Exchange rate significantly influences economic growth in Nigeria. In addition, world oil price and world gross domestic product have significant impact on economic growth in Nigeria. The study reveals that there is long run relationship among direct foreign investment, trade openness, exchange rate, world oil price, world gross domestic product and economic growth in Nigeria. These findings are useful in designing macroeconomic policies and framework in explaining the relationship among direct foreign investment, trade openness, exchange rate, world oil price, world gross domestic product and economic growth in Nigeria. In view of the findings of the study, it is hereby recommended that policy makers and economic planners should consider a holistic approach in designing macroeconomic policies and framework in explaining the relationship among external sector variables such as: direct foreign investment, trade openness, exchange rate, world oil price, world gross domestic product and economic growth in Nigeria.

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