

## BALANCE OF PAYMENT, INTERNATIONAL TRADE AND ECONOMIC GROWTH NEXUS IN NIGERIA: A LOOK INTO THIRLWALL'S LAW

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### **Abstract**

*This paper examines the nature of interrelationships that exist among balance of payment, trade and economic growth in Nigeria. The aim is ascertain validity (or not) of Thirlwall's law of Balance-of-Payment (BOP) constraint growth in Nigerian economy using the bounds testing Auto regressive Distributed Lag (ARDL) approach. The ARDL bound test suggests that the variables in the framework have a long run relationship. Specifically, the income elasticity of import is found to be positive and significant. This implies that an increase in economic growth in Nigeria often leads to a rise in import in the short run. The value of export though positively related to economic growth, is not significant (at preferred 5% level though it appears significant at 10% level) in explaining changes in economic growth in Nigeria. Also, the results of the Granger Causality Estimates corroborate the findings as it reveals that Import and economic growth in Nigeria reinforce each other. This further buttresses the Thirlwall's law of balance of payment constraint. The study concludes that in affirmation to Thirlwall, what a country produces and exports, as well as how the rest of the world spends (in relation to what the country produces) are crucial issues to the growth dynamics of an economy. From the above, the study recommends that the government should ensure the formulation and monitoring of efficient policies that will improve the growth rate of export to raise the economic growth rate. Precisely, current efforts being made to encourage and boost non-oil exports should be as a matter of deliberate economic policy vigorously pursued and implemented.*

**Keywords:** Balance of Payment, International Trade, Thirlwall's Law, Economic Growth, Gross Domestic Product (GDP), Auto Regressive Distributed Lag (ARDL)

## Introduction

The balance of payments of any country is the record of all international trade and financial transactions made by a country's residents. The balance of payments has three components. They are the current account, the financial account, and the capital account. The current account measures international trade, net income on investments, and direct payments. The financial account describes the change in international ownership of assets. The capital account includes any other financial transactions that don't affect the nation's economic output. The trends in the balance of payments and the components have to be carefully analyzed and projected. They constitute useful tools for monetary analysis and for macroeconomic policy decisions. The balance of trade account shows the value of total import and of total export transactions of a country with the rest of the world. The balance of services shows the net value of services between one country and the rest of the world. The final stand of the account (balance of trade) is very important for the determination of the current account surplus or deficit and for the determination of the country's reserve level. The balance of capital account can have a cushioning effect on the level of reserves (Onoh, 2007). A country which is losing reserves very fast because of deteriorating balance of payments position may improve its reserve position, if the foreign capital inflow is large.

Every nation has an international balance of payment problem. Developed, developing countries of the world, experience balance of payments problem. However, the difference between the developed and developing of countries as regards to balance of payments is that due to deterioration in their term of trade, the developing nations suffer the impacts of balance payments deficit more than the developed ones. Due to the fact that most of the less developed economics of the world have been experiencing the problem of financing their purchases from the developed nations, many of these less developed nations removed barriers in order to increase their sales and services to the developed economics. Because of the advantages of international trade discussed above, different nations engage in international trade.

In the realm of practical and actual experience, no economy is self-sufficient; every economy continues to and increasingly too, depend on another for one or more commodities or services. However, the nature of trade of a nation affects its rate of economic growth. This implies that international trade must as a matter of deliberate economic policy be well evaluated by nations to ensure they are not being shortchanged in terms of trade. This is more so as the main macroeconomic goal of the various economies of the world to grow and translate their growths into sustainable development, hence the reason for striving constantly to determine an ideal economic growth pattern that best suits different nations so as to monitor their rate of growth and make adjustments when necessary (Olayemi, Adedeji, Adenekan, & Owonikoko, 2017).

According to the Say's law, supply creates its own demand and the perfect workings of the economy will always ensure that what is produced is consumed. This is an important assumption upon which many neoclassical theories are based (Braudel, 1979). Meanwhile, the failure of the neoclassical supply constrained economy that assumes the growth of the economy as a result of changes in factors of production and technical progress (hence supply driven) lead to the emergence of the Keynesian effective demand driven economy (Keynes,

1936; Thirlwall, 1979; McCombie & Thirlwall, 2004; Aricioglu Ucan, & Sarac, 2013). In addition to their tenets, the aggregate demand in an economy is influenced by the activities in the international market; meaning that its demand can be constrained by its balance of payment. Therefore, it will be difficult to understand differences in the long run economic growth of a country without understanding the balance of payment of the economy (McCombie & Thirlwall, 2004; Olayemi et al., 2017).

The balance of payment constrained growth model is originally due to Thirlwall (1979), according to him "no country can grow faster than the rate consistent with the balance of payment equilibrium on current account unless it can finance ever growing deficits which in general it cannot". The economic performance of Nigeria has been greatly dependent on both domestic production and consumption activities as well as foreign transactions in goods and services. Specifically, it has been acknowledged that foreign trade is an engine of growth and development. The high dependence of the economy on oil exportation and other goods and services has exposed it to the activities in the international market. The Thirlwall's law of growth rate constraint has been tested in many countries and its importance and validity has been established not without its fair share of criticism though. Consequently, this study intends to ascertain the nature of interrelationships that prevail among balance of payment position, international trade and economic growth in Nigeria in order to appreciate the law as well as empirical specifics of the Nigerian setting using recent data.

### **Theoretical Framework and Review of Empirical Literature**

Economics and Finance scholars have continued to debate on subject matter of what causes differences in rates of economic growth among different economies. Two schools of thought exist in this regard. Thus, there are two view points on factors that constrain country's rate of economic growth. On one hand is the conventional view. This is Supply-Oriented Approach which opines that economic growth of a country is driven by technological progress and factors of production available in the economy and these are exogenously determined. On the other hand, there is the Demand-Oriented Approach which questions the presumption of exogeneity of factors of production and technological progress. The proponents of this view contend that the supply of factors of production and technological progress are driven by demand rather than determined exogenous factors outside the economy (Yongbook, 2006; Anega, 2010).

Following the Demand-Oriented Approach (that export demanded by other economies is the ultimate demand determinant of economic growth) is the argument of Thirlwall (1979). Accordingly, Thirlwall (1979) argued for an economic growth to be sustainable in an international context, the growing demand for imports associated with economic growth must be financed by the revenue of foreign exchange from exports. Thus economies only grow at a pace allowed by constraints imposed by the requirement of balance of payment. Assuming that a country's economic output is influenced by import and export, Thirlwall (1979) developed a seminal hypothesis assessing that a country's economic growth rate can be approximated by the inverse of import income elasticity multiplied by the rate of growth of exports. Moreover, Thirlwall showed that neither trade nor financial liberalization and export promotion strategy necessarily lead to better growth performance. Rather, one should consider not only exports of goods and services, but also the income elasticity of imports. The balance of payments-

constrained growth model postulates that the rate of growth in any country is constrained by its balance of payment as the economic growth cannot be higher than the consistent level of the balance of payment equilibrium, or, at least consistent with a sustainable deficit in the balance of payments.

This forms the theoretical foundation of this study. Hence, given this postulation therefore, this study intends to empirically ascertain the interrelationship and nexus between Balance of payment position, international and economic growth in Nigeria.

### **Review of Empirical Studies**

Several empirical works on the nature of relationship that exists between Balance of Payments and economic growth have been carried out. Again, since the proposition by Thirlwall (1976), a number of studies have emerged for and against the argument using different economies at different levels of development as case studies (Blecker, 2016; Lelis, Silveira, Cunha & Haines, 2017; Fasanya & Olayemi, 2018).

For instance, Blecker (2018) observes the heightened interests of various researchers on empirically checking the validity (or not) of Thirlwall's law. In the work, Blecker (2018) article reviews the 'current' state of the debate over these critiques and also offers a brief discussion and evaluation of three alternative models. The alternative models all highlight a significant role for the level of relative prices (or the real exchange rate) in determining long-run growth, which is consistent with recent empirical studies.

Lelis et. al. (2017) analyze the balance-of-payments-constrained growth in Brazil considering Thirlwall's Law (1979). Their work estimates export and import demand functions using two econometric models of Vector Error Correction and Structural State Space Model for the period of 1995–2013. The results support Thirlwall's law and affirm that the balance of payments is a constraint to the Brazilian economic growth. This is revealed in the following findings: the ratio between exports and imports income elasticities; (ii) the low sensitivity of exports to changes in the real exchange rate; and (iii) the evidence that exports are more sensitive to alterations in commodities prices than to changes in the real exchange rate.

Anega (2010) sets out to empirically test the validity of the simplified version of the balance of payment-constrained economic growth model for Ethiopia during the period 1971-2008. Import demand function is estimated for the same period in order to estimate income elasticity; co-integration test between GDP and export is conducted using the Engel Granger technique and the effect of liberalization on import income elasticity is incorporated into the analysis. The finding shows that the average economic growth over the sample period is 2.84 percent, whereas the economic growth as suggested by Thirlwall's law is 7.42 percent. These findings show that Ethiopia's economy has been growing at a low rate as compared to the model's predicted growth rate. The researcher observes that achieving persistent and sustainable economic growth depends upon the strategies that relate to institutional and technological progress along with the other significant factors such as sound infrastructure and continuity in policies.

In a work, *Economic Growth in Open Economies: Balance of Payments Constrained Growth and Beyond?* Perraton (2003) examines the model of balance of payments constrained growth (or 'Thirlwall's law') as a key post-Keynesian model of demand-determined growth, which builds upon earlier post-Keynesian work on the determinants of growth. The paper

argues that in many ways the model provides a compelling account of stylized facts about growth that are not adequately explained in mainstream models. The paper however agrees that there are a number of areas in which the model may need refinement and extension for successful application. The paper particularly, examines issues in terms of the model's conceptualization of adjustment and possible extensions in terms of its underlying conception of growth and structural change.

In support of these is the confirmation of the theory in the South African economy, using an Autoregressive Distributed Lag (ARDL) Bounds Testing approach, Ozturk and Acaravci (2010) applied the Thirlwall's basic balance of payments constraint growth model to South African economic growth for the period of 1984 to 2006, the empirical results revealed that import is co integrated with relative price and income, and the equilibrium growth rates coincide with actual growth rate. They therefore recommended that a successful economic growth policy, which reduces income elasticity of imports and promotes export, should be put into play which will permit South Africa to have a rapid growth in demand and supply without suffering deterioration in its balance of payments. Ebru, Okyay, and Bahadır (2013) also used the same methodology of autoregressive distributed lag model but with the Kalman Filter method in the case of Turkey, the study revealed that the Turkish economy has been experiencing balance of payment deficit for the last three decades; the result found that the Thirlwall's law is not valid for Turkey. The study recommends that instead of total export and total import values, specific sector (automotive, textile and etc.) values may be taken into consideration. Surprisingly however, is the result of Ahmad,

Roosbeh and Ramezan (2011), the relative price was found to be a significant determinant of import growth as confirmed by the long run relationship between import growth rate, economic growth rate and relative prices in Iran using the autoregressive distributed lag bound testing approach. This is against the Thirlwall's assumption. The study further finds that Thirlwall's law of estimated growth rate being equal to the actual growth rate is statistically insignificant as the constant of the regression and coefficient of the actual growth rate is found not be equal to zero and one respectively, this means that the Thirlwall's law is not valid for Iranian economy. They conclude that the reason for this may be due to the fact that Iran is a member of OPEC and its oil export plays a significance role in the country's foreign trade and that a policy of export promotion combined with an import substitution strategy could not help the economic growth, since both strategies do not lead to moderate balance of payments constraints in the long run. This means that the long-run growth of real GDP depends on some other variables that are not included in the model such as capital flow, economic structure and so on.

Distinct from the above empirical researches that employed ARDL, Mwege, Mwangi and Ochilo (1994) used an alternative framework (three - gap framework) to investigate whether it is savings, fiscal and foreign exchange gaps that is the binding constraint on growth capacity in Kenya, while examining macroeconomic constraints and medium-term growth in Kenya. They also examine how these various gaps have evolved since the early 1970s. They discover that, for some reasonable ratios of intermediate import, foreign exchange is a major resource constraint to potential growth in Kenya. They conclude that with increased supply of foreign exchange and the associated reduction of import compression, savings, fiscal and external gaps

that inhibit good macroeconomic performance will be alleviated. This study is therefore expected to corroborate the earlier findings that export and import performances are very crucial to growth.

In the home front, a number of studies have also been carried out in the area of Balance of payments and international trade effects on growth process of the economy. For instance, Fasanya and Olayemi (2018) examine the Balance-of-Payment (BOP) constraint growth model in Nigeria for the period of 1980 to 2012 using the bounds testing Auto regressive Distributed Lag (ARDL) approach. The ARDL test suggests that the variables in the framework have a long run relationship. The empirical findings reveal that import is co-integrated with relative price and income, and the equilibrium growth rates coincide with actual growth rates. The study thus concludes that the Thirlwall's law, of actual growth rate being equal to the predicted growth rate by the balance of payment current account equilibrium holds in Nigeria.

Adopting a linear regression mechanism, Tijani (2014) in a study, Empirical Analysis of Balance of Payment Adjustment Mechanisms: Monetary Channel in Nigeria, 1970– 2010, aims at understanding the application of monetary approach as adjustment mechanism to correct balance of payments dis-equilibrium. The findings reveal a positive relationship between Balance of Payments and Domestic Credit, Exchange Rate and Balance of Trade while Inflation Rate and Gross Domestic product are otherwise. It concludes that though not entirely, monetary measures constitute immensely to the position of BOP, cause disturbances and also serve as adjustment mechanism to bring BOP to equilibrium depending on its application and policy mix by monetary authority.

In the same vein, Imoisi (2012) examines the trends in Nigeria's Balance of Payments position from 1970-2010. The result shows that the independent variables appeared with the correct sign and thus, conforms to economic theory, but the relationship between Balance of Payments and inflation rate was not significant. However, the relationship between Balance of Payments, Exchange rate and interest rate was significant.

Anoka and Takon (2014) examine balance of payments constrained growth in Nigeria. Their study is also a validity test of the theoretical underpinnings of the Original and Expanded Thirlwall's model derived from the Harrods Foreign Trade. The authors observe that Nigerian economy has had its share of protracted balance of payments challenges, which has led to grave macroeconomic problems. From their findings, it is observed that, all the variables in the model contributed 71 per cent to changes in economic development. The authors therefore suggest a reduction in demand for imports and increase the supply for exports, through balance of payments constraint alleviating strategies, such as export-based growth policy to stimulate growth and development.

Imoughale and Ismaila (2015) evaluate relationship between the phenomenon of monetary policy phenomenon and Balance of Payment (BOP) in Nigeria. The study uses time-series data which spanned between 1986 and 2013. Accordingly, the effects of stochastic shocks of each of the endogenous variables are explored using Error Correction Model (ECM). The study shows evidence of long run relationship among the monetary policy variables and BOP. The authors note that the essential finding of the study shows that monetary policy variables of Exchange rate, Broad money supply and credit to the private sectors are the major monetary factors that determine BOP in Nigeria. Thus, it is concluded that monetary policies



and implementation capacity is important in the Nigerian economy, because it is very special for determining the provision of interest rate to private sector which produce for export which will have a spillover effect on BOP and economic growth. Also, Balance of Payment is a monetary phenomenon and monetary policy can be used by monetary authority to improve and stabilized the foreign sector performance in Nigeria.

A major fall out of the studies reviewed above is that there exist variations in the nature of empirical relationships between the balance of payments, trade and economic growth. The prevalence of variations in the empirical results given various economic settings therefore, implicates the need for such a vital study in Nigeria using current data, which constitutes the key gap addressed by this study.

### Materials and Methods

To ensure clarity, this section has been further divided into subsections as presented below:

#### Data

The data presented in table 1 below shows the growth rate of Gross Domestic Product (GDPGR), annual growth rate of Import, annual growth rate of Export, as well as Annual Values of Naira Average Exchange Rate with the US Dollar over the period 1981 to 2017.

**Table 1: growth in Import (IMGR), growth in Export (EXGR), growth in Gross Domestic Product (GDPGR) and Exchange Rate from 1981 to 2017**

YEAR	IMGR	EXGR	GDPGR	EXCR
1981	-	-	-	<b>0.6100</b>
1982	-0.16115	-0.25554	-0.01789	<b>0.6729</b>
1983	-0.17333	-0.08577	-0.07577	<b>0.7241</b>
1984	-0.19378	0.21133	-0.00509	<b>0.7649</b>
1985	-0.01612	0.289701	0.085248	<b>0.8938</b>
1986	-0.15278	-0.23891	0.018997	<b>2.0206</b>
1987	1.985109	2.403426	0.001702	<b>4.0179</b>
1988	0.200653	0.027411	0.062333	<b>4.5367</b>
1989	0.438992	0.85848	0.066561	<b>7.3916</b>
1990	0.481452	0.895529	0.116276	<b>8.0378</b>
1991	0.9574	0.106012	-0.00552	<b>9.9095</b>
1992	0.599666	0.691784	0.021935	<b>17.2984</b>
1993	0.157024	0.063996	0.015688	<b>22.0511</b>
1994	-0.01715	-0.0581	0.002566	<b>21.8861</b>
1995	3.638696	3.613535	0.018723	<b>21.8861</b>
1996	-0.25493	0.377508	0.04052	<b>21.8861</b>
1997	0.503158	-0.05184	0.028859	<b>21.8861</b>
1998	-0.00981	-0.39448	0.024956	<b>21.8861</b>
1999	0.029969	0.581378	0.005218	<b>92.6934</b>
2000	0.142034	0.636478	0.055185	<b>102.1052</b>

2001	0.378832	-0.03997	0.066668	<b>111.9433</b>
2002	0.113766	-0.06626	0.146044	<b>120.9702</b>
2003	0.375185	0.770397	0.095026	<b>129.3565</b>
2004	-0.0448	0.490593	0.10442	<b>133.5004</b>
2005	0.409558	0.574382	0.070085	<b>132.1470</b>
2006	0.109846	0.010784	0.06726	<b>128.6516</b>
2007	0.258462	0.134487	0.073181	<b>125.8331</b>
2008	0.429767	0.25006	0.071993	<b>118.5669</b>
2009	-0.02012	-0.17149	0.083533	<b>148.8802</b>
2010	0.489598	0.395658	0.095398	<b>150.2980</b>
2011	0.346876	0.268509	0.053079	<b>153.8616</b>
2012	-0.1118	-0.00639	0.042059	<b>157.4994</b>
2013	-0.0335	0.008104	0.054878	<b>157.3112</b>
2014	0.116464	-0.1508	0.062229	<b>158.5526</b>
2015	0.050982	-0.31753	0.027864	<b>193.2792</b>
2016	-0.14407	-0.00108	-0.01583	<b>253.4923</b>
2017	0.139708	0.583155	0.00824	<b>305.7901</b>

*CBN Statistical Bulletin 2017*

### Empirical Model Specification

Based on assumptions of Thirlwall's law, the relationship between economic growth and Balance of Payment is expressed as follows:

$$GDPGR = f(IMGR, EXGR, EXCR) \quad (1)$$

Where:

*GDPGR* = Gross Domestic Product Growth Rate

*IMGR* = Import Growth Rate

*EXGR* = Export Growth Rate

*EXCR* = Exchange Rate

For our study, the model is then fitted as follows

$$GDPGR_t = \gamma_0 + \gamma_1 IMGR_t + \gamma_2 EXGR_t + \gamma_3 EXCR_t + GDPGR_{t-1} + u_t \quad (2)$$

### A PRIORI EXPECTATION

Summarily, the a priori expectation is stated thus;

$$\beta_1 > 0, \quad \beta_2 < 0, \quad \beta_3 < 0 \text{ or } > 0$$

### Presentation of Empirical Results

#### Unit Root Test (Test for Stationarity)

**Table 2: ADF unit root test results**

Differenced Variables	ADF-statistic	Test Critical Values			Order of Integration	Prob.
		1%	5%	10%		
GDPGR	-7.620586	-3.639407	-2.951125	-2.614300	I(1)	0.0000
IMGR	-6.051767	-3.653730	-2.957110	-2.617434	I(1)	0.0000



EXGR	-5.059700	-3.689194	-2.971853	-2.625121	I(1)	0.0003
EXCR	-3.903326	-3.632900	-2.948404	-2.612874	I(1)	0.0023

**Source: Author's Computation using E-VIEWS**

Given the conditions for acceptance, the ADF statistic values are higher than the Test Critical values at all levels, therefore, acceptable.

After this, we proceeded to Co-integration test to ascertain the long-run relationship of the variables. This was done using the ARDL Bound Test for Co-integration.

**Analysis of Cointegration**

**Table 3: ARDL Bound Test for Cointegration**

ARDL Bounds Test			
Date: 03/20/19 Time: 12:34			
Sample: 1983 2017			
Included observations: 35			
Null Hypothesis: No long-run relationships exist			
Test Statistic	Value	k	
F-statistic	3.836884	3	
Critical Value Bounds			
Significance	I0 Bound	I1 Bound	
10%	2.72	3.77	
5%	3.23	4.35	
2.5%	3.69	4.89	
1%	4.29	5.61	

**Source: Author's Computation using E-VIEWS 9**

From table 3, we can see that the F-statistic (3.83688) has a value that is higher than all conventional levels of significance for I(0) bound, indicating that the test is highly significant. Thus, given that the F-statistic is at least, significant at 5% level for both I(0), we therefore, reject the null hypothesis, and conclude that there exists long-run relationships among the variables included in the estimated ARDL model.

**VAR Lag length selection**

To determine the appropriate lag length for the model, we use three different information criteria; namely, Akaike information criterion (AIC), Schwarz information criterion (SIC) and Hannan-Quinn information criterion (HQ). The results are shown below.

**Table 4: VAR lag order selection; \* indicates the selected lag order**

VAR Lag Order Selection Criteria				
Endogenous variables: GDPGR IMGR EXGR EXCR				

Exogenous variables: C						
Date: 03/20/19 Time: 12:41						
Sample: 1981 2017						
Included observations: 32						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-169.0430	NA	0.584942	10.81518	10.99840	10.87592
1	-104.3815	109.1161*	0.028231*	7.773847*	8.689932*	8.077503*
2	-95.53023	12.72377	0.046488	8.220639	9.869592	8.767220
3	-86.28188	10.98241	0.081269	8.642618	11.02444	9.432124
4	-61.76853	22.98127	0.063552	8.110533	11.22522	9.142964
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

**Source: EViews output**

From the results in table 4 shows that each of AIC, SIC and HQ has a minimum value at lag 1 as indicated by the asterisks (\*). This implies that we the model is best specified with the variables at lag 1. Below is the estimated Auto Regressive Distributed Lag (ARDL).

**Table 5: ARDL Estimates**

Dependent Variable: GDPGR				
Method: ARDL				
Date: 03/20/19 Time: 21:23				
Sample (adjusted): 1982 2017				
Included observations: 36 after adjustments				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (1 lag, automatic): IMGR EXGR EXCR				
Fixed regressors: C				
Number of models evaluated: 8				
Selected Model: ARDL(1, 1, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDPGR(-1)	0.906089	0.067414	13.44067	0.0000
IMGR	0.683103	0.258461	1.753082	0.0005
IMGR(-1)	-0.804177	0.241845	-3.325172	0.0025

EXGR	0.176758	0.132588	-1.333137	0.0932
EXGR(-1)	0.630261	0.140643	4.481277	0.0801
EXCR	-2.888128	11.62896	-0.248356	0.0057
EXCR(-1)	-25.45492	13.05745	1.949456	0.0613
C	1804.836	1083.620	1.665561	0.1070
R-squared	0.798468	Mean dependent var	33235.84	
Adjusted R-squared	0.698085	S.D. dependent var	18921.19	
S.E. of regression	828.0850	Akaike info criterion	16.46924	
Sum squared resid	19200295	Schwarz criterion	16.82113	
Log likelihood	-288.4463	Hannan-Quinn criter.	16.59206	
F-statistic	2606.460	Durbin-Watson stat	1.518110	
Prob(F-statistic)	0.000000			
*Note: p-values and any subsequent tests do not account for model selection.				

### EvIEWS 9 output

The ARDL estimation results shows a coefficient of determination ( $R^2$ ) of 0.698085, which implies that variations in all the explanatory variables account for about 69% of the variations in Nigeria's Gross Domestic Product, while the rest 31% of the variations is attributable to other variables not captured in the study. The results provide evidence that in the short run, the coefficients of gross domestic product, imports (both at level and lag 1) as well as exchange rates at level are significant in explaining the variations in gross domestic product. On the other hand, exports value fail the significance test. On the whole, the F-statistic is significant at 0.05 level, which implies a good line of fit while the Durbin-Watson statistic value of 1.518110 is within acceptable range and serves as an evidence of absence of significant autocorrelation.

### Presentation of Granger Causality Estimates

Table 5 below shows estimates of Granger Causality

**Table 6: Pairwise Granger Causality Tests**

Pairwise Granger Causality Tests			
Date: 03/20/19 Time: 12:50			
Sample: 1981 2017			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
IMGR does not Granger Cause GDPGR	34	0.34698	0.0097
GDPGR does not Granger Cause IMGR		0.22436	0.0004
EXGR does not Granger Cause GDPGR	34	0.43770	0.5497
GDPGR does not Granger Cause EXGR		0.66137	0.5238

EXCR does not Granger Cause GDPGR	34	0.18943	0.0284
GDPGR does not Granger Cause EXCR		0.67764	0.5157

**Source: Author's Computation using E-VIEWS 7**

The Granger causality estimation test result on the direction of causality shows that there exists a significant bi-directional relationship between level of gross domestic product and imports. Also, there exists a uni-directional causal relationship between exchange rates and gross domestic product. The direction of causality flows from exchange rates to gross domestic product. On the other hand, there exists no evidence of significant causal relationship at 0.05 level between exports and gross domestic product.

### **Discussion, Conclusions and Recommendations**

The unit root result shows that all the series are integrated of order 1, i.e. they are all stationary only after the first difference. Thus, we can then be thinking of a possibility of long run relationship among these variables, since their value today actually differ from that of tomorrow. The study therefore proceeds to bound test for the presence of co-integration. The results confirm the evidence of long run relationship between balance of payment components and economic growth. Further, we proceed to ARDL to ascertain the short run dynamics and interrelationship among the variables of study. The lag order however needs to be determined before the ARDL model is estimated. Using the VAR lag order selection based on these five criteria; Log likelihood, final prediction error (FPE), Akaike information Criterion (AIC), Schwarz information criterion and Hannan Quinn information criterion (HQ). The results show that all the criteria have suggested a lag length of one as an optimal lag length.

From the ARDL estimates, the income elasticity of import is found to be positive and significant as suggested by the Thirlwall's law, the table shows that a 1% increase (decrease) in GDP will generate though less than proportionate but positive 0.68% increase (decrease) in import. This relationship is found to be significant at 5%. This tells us that an increase in economic growth in Nigeria often lead to a rise in import in the short run. The value of export though positively related to economic growth, is not significant (at preferred 5% level though it appears significant at 10% level) in explaining changes in economic growth in Nigeria. Also, the results of the Granger Causality Estimates corroborate the findings as it reveals that Import and economic growth in Nigeria reinforce each other. This further buttresses the Thirlwall's law of balance of payment constraint. In other words, what a country produces and exports, as well as how the rest of the world spends (in relation to what the country produces) are crucial issues to the growth dynamics of an economy (Thirlwall, 1976; Fasanay & Olayemi, 2018; Anega, 2010) This might be connected to the fact that the economy of Nigeria depends solely on international trade even though oil dominates the export. The study therefore concludes that the growth in Nigeria is balance of payment constrained. From the above, this study therefore recommends that the government should ensure the formulation and monitoring of efficient policies that will improve the growth rate of export to raise the economic growth rate. Current efforts being made to encourage and boost non-oil exports should be as a matter of deliberate economic policy vigorously pursued and implemented.

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