

## **International Monetary Fund Stabilization Programme and External Sector Development in Nigeria**

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**ABSTRACT :** *The impact off the International Monetary Fund (IMF) stabilization programme has been a subject of great controversies. This study therefore investigated the impact of policy recommendations contained in the IMF stabilization Programme on the development of Nigeria's external sector. In specific terms, the study examined the impact of fiscal deficit, exchange rate, foreign direct investment (FDI), degree of trade openness, interest rate and bank credit to the domestic economy on two indicators of external sector development namely; balance of payments (BOPs) and external reserves. A variety of analytical techniques including Phillips-Perron unit root test, autoregressive distributed lag (ARDL) model, error correction model (ECM) and Granger causality test was applied on annual time-series data from 1986 to 2021. The findings indicated that fiscal deficit has significant negative impact on balance of payments while exchange rate and interest rate have insignificant negative impact on BOPs. Also, degree of trade openness has significant positive impact on BOPs while FDI and bank credit to the domestic economy have insignificant positive impact on BOPs performance. Similarly, fiscal deficit, exchange rate and interest rate have insignificant negative impact on external reserves while foreign direct investment, degree of trade openness and bank credit to the domestic economy have insignificant positive impact on external reserves. In line with the IMF recommendations, the study recommended that the Nigerian government should reduce the size of its fiscal deficit; encourage the inflow of FDI and open up the economy to international trade. However, against the IMF recommendations, the study recommended that a managed free floating exchange rate policy should be adopted while the interest rate should be lowered. It is also recommended that bank credit to the private sector should be expanded.*

**KEYWORDS:** IMF, programme external, sector development

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## INTRODUCTION

The early 1980s in Nigeria was characterized by dwindling economic fortunes as oil prices fell due to the glut in the international oil market. In fact, before 1986, the Nigerian economy witnessed serious economic crises. There was widespread distortions and imbalances in the economy, dwindling economic growth, increasing unemployment rates, galloping inflation rates, high level of poverty, fast-depleting external reserves, over valued naira, worsening balance of payments, etc. By 1993, Nigeria's short-term trade arrears amounting to over N4billion had accumulated (Anyanwu, 1993; Anyanwu et al, 1997).

Meanwhile, developing countries experiencing severe macroeconomic problems were advised to adopt the International Monetary Fund (IMF) stabilization programmes. It was believed that the stabilization programmes would correct the defective structure, reduce ineffectiveness, reverse the worsening inflation, poverty and unemployment; and correct the worsening balance of payments problems being faced by the less developed countries (Todaro & Smith, 2011).

It is important to note that the IMF stabilization programmes have being a subject of intense debate among scholars, political leaders and policy makers. Proponents of the Fund's stabilization programme believe that it promotes growth and helps countries with severe debt and balance of payments crises to resolve them. On the other hand, critics hold the contrary view that the IMF stabilization programme perpetuates poverty, aggravates balance of payments crisis and entrenches a vicious cycle of indebtedness in the less developed countries (Mussa & Savastano, 1999; Tadaro & Smith, 2011; Sulaiman et al, 2014; Demiroglu & Karagoz, 2016, etc).

In 1986, the Nigerian government adopted some of the policy recommendations embedded in the IMF stabilization programme through the introduction of the Structural Adjustment Programme (SAP). The core aim of the IMF/World Bank recommended SAP was to reverse the worsening BOPs condition, reduce the debilitating debt burden, reduce fiscal deficits, among others. In short, the essence of the SAP was to reverse the worsening economic situation in the country prior to July 1986 (Anyanwu, 1993). In pursuant of the broad objectives of the SAP, certain policy measures were embarked upon. Specific to the IMF stabilization programmes, some of the policy elements of the SAP included the following:

- (i) deregulations of the foreign exchange market through the introduction of the second-tier foreign exchange market (SFEM).
- (ii) privatization and commercialization of state-owned enterprises;
- (iii) withdrawal of petroleum subsidy;
- (iv) interest rate deregulation; and
- (v) trade liberalization (Anyanwu, et al, 1997; Analogbei, 2020)

From the foregoing, it is clear that Nigeria adopted some of the policy recommendations of the IMF stabilization programme in 1986 through the introduction of the SAP. However, no significant improvements have been made in the country's external sector performance over the years (Nwanosike et al, 2017; Korgbeelo, 2019; Central Bank of Nigeria, 2021). But it would be inappropriate to attribute the poor performance of the country's external sector to the policy recommendations of the IMF stabilization programme. Such a claim can only be backed up by empirical evidence. Besides, empirical evidence from previous studies in Nigeria has not been able to resolve the controversies surrounding the effectiveness of the Fund's programme. It is against this backdrop that this study seeks to examine the impact of the recommendations contained in the IMF stabilization programme on the development of the external sector in Nigeria

## **CONCEPTUAL CLARIFICATIONS AND LITERATURE REVIEW**

### **Conceptual Clarifications**

#### **External Sector Development**

External sector development refers to the improvement in the country's external sector. For the purpose of this study, external sector development is captured in terms of the performance of two external sector indicators namely; the balance of payments and the external reserves.

The balance of payments (BOPs) is a systematic record of a country's transactions with other countries of the world in a particular year (Marrewijk, et al, 2007). It involves macro-level accounting for the country based on the principles of double-entry book-keeping with equal credit and debit entries (Robinson, 2003)

External reserves, also called foreign exchange reserves or international reserves, refer to assets held as reserve by a country's monetary authority in foreign currencies. These assets include bank notes, bonds, deposits, treasury bills and other foreign government securities. The external reserves, among other things, are held to ensure that the government has back-up funds in the event of rapid depreciation of the domestic currency (Iwueze et al, 2013).

#### **The IMF Stabilization Programme**

Over the years, the IMF has been performing different functions for its member countries in accordance with the Fund's Article of Agreement. Such functions are performed with regard to monetary, fiscal and financial issues. The IMF makes its general resources available to member countries that experience severe macroeconomic problems including high inflation, growing budgets and trade deficits, BOPs deficits, etc. These shocked economies need to be stabilized. The IMF assists such countries by designing stabilization programmes, i.e., providing policy advice, technical assistance and emergency funding (Demiroglu & Karagoz, 2016). When the IMF assists member countries to eradicate the causes of their balance of payments problems (i.e., BOPs deficits), it does so under an agreed arrangement, indicating the requirements concerning an

acceptable programme of economic reforms that is often referred to as IMF conditionality. It includes policies a member nation may need to carry out before the approval of the disbursement of the initial tranche of support as well as policies that must be implemented for the payment of subsequent instalments of the financial support (Akpakpan, 1999, Mussa & Savastano, 1999; Krueger, 2000). The International Monetary Fund stabilization programme therefore refers to a set of market-oriented economic policies targeted at reducing fiscal deficits, curbing inflationary pressures, and improving BOPs (Torado & Smith, 2011). It is a comprehensive set of economic measures designed to achieve a viable BOPs within the context of improved long-term economic growth and price stability (Demiroglu & Karagoz, 2016).

The essential components to the typical IMF stabilization programme, according to Torado and Smith (2011), include the following:

- (i) liberalization of foreign exchange and import controls;
- (ii) devaluation of the official exchange rate;
- (iii) stringent anti-inflation policies such as credit control to raise interest rates, reduction in government expenditure to reduce fiscal deficits, wage control, elimination of price control, etc; and
- (iv) opening up of the local economy for foreign trade and investments.

### **Theoretical Literature Review**

The IMF stabilization programmes are mostly based on the analytical models developed by three of its economists namely, J.J. Polak, Robert Mundell, and J.M. Fleming. These models were based on the monetary approach to balance of payments adjustment (Doroodian, 1994). The models developed by Polak, Mundell and Fleming are presented in this section.

#### **The Polak Model**

J.J. Polak was the first of the three economists to analyze the impact of domestic credit expansion and autonomous changes in exports on nominal income and BOPs. He examined monetary variables that are most likely to be impacted by policy tools developed to tackle BOPs disequilibrium (Avramovic, 1989).

The Polak model in its simplest version contains four equations. These equations according to Gligorov (2011), are stated as follows:

$$\begin{aligned} M_s &= kY \text{ or } \Delta M_s = k\Delta Y \dots\dots\dots (1) \\ M &= m Y \dots\dots\dots (2) \\ \Delta M_s &= \Delta R + \Delta DC \dots\dots\dots (3) \end{aligned}$$

where  $M_s$  = money supply or liquidity of money

$k$  = the inverse of the velocity of circulation

$Y$  = national income

$M$  = imports

m = marginal propensity to import

X = exports

K = net capital inflows

R = reserves

DC = domestic bank credit

$\Delta$  = change notation

The Polak model is based on a set of assumptions which are derived from the four equations. These are:

- (i) income and money supply have a direct proportional relationship;
- (ii) import directly depend on income;
- (iii) import and foreign reserves are inversely related;
- (iv) exports and net capital inflows are positively related to foreign reserves; and
- (v) an increase in nominal income positively induces a stable demand for money and a change in import (Gligorov, 2011)

Based on the above assumptions, the model defines the change in the supply of money as the sum of a change in the foreign reserves, and a change in the domestic bank credit. Hence, an increase in the supply of money is induced by an increase in the domestic bank credit or an increase in foreign reserves and vice versa (Arewa & Nwakanma, 2013).

Considering equation 3, and given that the supply of money is exogenously determined (i.e., fixed money supply), Polak postulated a dynamic nexus between changes in domestic money supply and changes in the foreign account. Polak therefore concluded that the only permanent influence of domestic credit expansion is a similar decrease in external reserves (due to increased imports) and that a contraction in the domestic bank credit leads to an improvement in the BOPs. Since credit expansion brings about excessive budget deficits in most developing countries, Polak's model therefore laid the basis for the IMF policy tools, i.e., credit constraint and fiscal discipline (Arewa & Nwakanma, 2013).

### **The Mundell-Fleming Modell**

The Mundell-Fleming (F-M) model or the IS-LM-BP model is an extension of the Hicks-Hansen IS-LM framework which shows the single interest rate and income at which the product and money markets are simultaneously at equilibrium in a closed economy (Hsing, 2020). Mundell (1963) and Fleming (1962) integrated the foreign sector into the closed economy IS-LM model. By expanding their analytical models to include both a fixed and flexible exchange rate regimes, Mundell and Fleming analyzed the short-term impact of monetary and fiscal policies on a small open economy. The M-F model expresses the response of capital movements to interest rates, and the influence of the exchange rate on net exports. The model therefore became an instrument for policy analysis in a world trending towards financial integration (cui et al, 2010). As the basis for IMF policy, the M-F model seeks to analyze how monetary and fiscal policy measures can be used to adjust

disequilibrium in the BOPs without resorting to policies that would jeopardize national or global prosperity (Obstfeld, 2001).

The main conclusion of the M-F model is that the efficacy of any policy (monetary or fiscal) depends on the exchange rate regime prevailing in the country, i.e., whether the country is operating a flexible or fixed exchange rate regime (Hsing, 2020). From the foregoing, and based on the assumption of perfect mobility of capital, the M-F model leads to the following specific policy recommendations:

(i) Under flexible exchange rate regime, monetary policy has the strongest impact on national income and employment. Thus, an expansionary monetary policy (i.e, increased supply of money) induces capital outflows, depreciates the exchange rate and the therefore stimulates net export surplus (i.e, BOPs surplus). On the other hand, an expansionary fiscal policy (increased government expenditure) has no effect on national income and employment. Fiscal policy also leads to exchange rate appreciation and induces BOPs deficits. In fact, the impact of increased government spending is nullified by currency appreciation (Sarantis, 1986; Han, 2014).

(ii) Under fixed exchange rate regime, fiscal policy has the strongest impact on the level of national income and employment. An increase in government expenditure results in an immediate increase in the rate of interest which in turn nullifies the effect of the fiscal expansion. Under the fixed exchange rate regime, monetary policy has no significant impact on national income and employment. In fact, the central bank loses its control over money supply given that it has to be adjusted in order to maintain the fixed exchange rate. Monetary policy can only alter the level of external reserves (Han, 2014; Hsing, 2020).

### **Empirical Literature**

Ul-Haque and Khan (1998) surveyed the empirical evidence on cross-country studies on the efficacy of IMF-supported programmes on BOPs performance of developing countries. The findings indicated that IMF programmes have been largely successful in economic stabilization. In a study of 21 Latin-American countries, Ozturk (2008) established that IMF programmes have positive impact on the BOPs and current account. Dreher and Walker (2009) found that IMF interventions generally reduce currency crises in programme countries. Imoisi (2012) observed that exchange rate and interest rate have significant positive impact on BOPs in Nigeria. Umoru and Odjegba (2013) showed that exchange rate misalignment has positive effect on BOPs in Nigeria. Similarly, Odili (2014) established significant positive impact of exchange rate on BOPs in Nigeria.

Awujola et al (2014) found that government capital and recurrent expenditure has positive impact on external reserves. Shajari and Berthomieu (2015) established that IMF/World Bank adjustment programmes has no significant impact on the economies of six countries of the Mediterranean,

Middle East and North African region. Similarly, Kerich (2016) found a strong negative nexus between IMF programmes and BOPs performance in Kenya. Nteegah and Okpoi (2016) observed that non-oil exports and exchange rate have significant positive impact on external reserves while oil exports has significant positive impact on external reserves in Nigeria. On the other hand, non-oil imports has insignificant negative impact on external reserves while oil imports has significant negative impact on external reserves in Nigeria. Senibi et al (2016) found significant positive impact of public debt on Nigeria's external reserves. Afolabi and Adekunle (2017) showed that exchange rate volatility has significant negative impact on BOPs in Nigeria while Oghenebrume (2018) observed that exchange rate and exchange rate volatility have positive and negative effects respectively on Nigeria's BOPs.

Nwanosike et al (2017) established that exchange rate and foreign direct investment have significant negative impact on Bops while trade openness has weak negative impact on BOPs in Nigeria. Izekor and Aigbovo (2018) showed that exchange rate instability has no significant effect on foreign reserves in Nigeria. korgbeelo (2019) found that balance of trade, trade openness and exchange rate have weak positive impact on BOPs in Nigeria. Nnamaka et al (2021) found that oil exports has significant positive impact on external reserves while non-oil exports has insignificant positive impact on external reserves. On the other hand, oil imports, non-oil imports and exchange rate have significant negative impact on eternal reserves in Nigeria.

From the empirical literature reviewed, it is observed that previous studies on the subject in Nigeria emphasized the impact of exchange rate on BOPs performance. Few other studies examined the impact of exchange rate on external reserves. Thus, no serious attention has been given to the impact of variables like fiscal deficit, foreign direct investment, degree of trade openness, etc on BOPs, and especially, on external reserves. In addition, findings from previous studies on the topic in Nigeria have not been consistent. Thus, while some studies showed that the Fund's programme has positive impact on Nigeria's external sector performance, other studies showed that the IMF programme has negative impact on the performance of the external sector in Nigeria. Besides, the dynamic nature of the Nigerian economy necessitates the need to confront the topic with the latest empirical data to see whether the outcome of the present study will differ significantly from the findings of previous studies.

To fill the gaps identified above, this study examines the impact of fiscal deficit, exchange rate, foreign direct investment, interest rate, degree of trade openness and size of credit to the domestic economy on external sector development in Nigeria. External sector development is measured in terms of two external sector variables namely; BOPs and external reserves.

## METHODOLOGY

### Description of Variables

The variables used for this study are briefly described in this section

#### Dependent variables

The dependent variables for this study are as follows:

**(i) Balance of payments**

This refers to the overall annual balance of Nigeria's transactions with the rest of the world.

**(ii) External Reserves**

This refer to the assets held as reserve by the Central Bank of Nigeria in foreign currencies

#### Independent Variables

**(i) Fiscal Deficit**

This refers to the size of deficit in the annual budget of the Federal Government of Nigeria. It is a measure of the level of fiscal discipline on the part of the government.

**(ii) Exchange Rate**

This refers to the amount of naira that is exchanged for one US dollar.

**(iii) Foreign Direct Investment**

This is the total monetary value of investments in direct productive activities by foreigners in Nigeria.

**(iv) Interest Rate**

This is the percentage of the principal charged by the deposit money banks for the loans granted to their customers in Nigeria.

**(v) Degree of Trade Openness**

This is the extent to which the Nigerian economy is opened to international transactions. It is measured in terms of the sum of exports and imports divided by gross domestic product (GDP)

**(vi) Domestic Bank Credit**

This refers to the total amount of credit granted by the banking system to the domestic economy.

### Models Specification

The empirical models used for this study are specified based on the Polak and Mundell-Fleming models, and the empirical model used by Nwanosike et al (2017) which is expressed as follows:

$$\text{BOP} = f(\text{EXR}, \text{DOP}, \text{FDI}, \text{MS}, \text{FD}) \dots\dots\dots (5)$$

where BOP = Balance of Payments,

EXR = Exchange Rate,

DOP = Trade openness of the Economy,

FDI = Foreign Direct Investment,

MS = Money Supply,

FD = fiscal Deficit



f = Functionality Notation

The above adopted model was however slightly modified to allow for the inclusion of the variables of the present study.

The models used for this study are therefore specified as follows:

**Model I: Balance of Payments Model**

The mathematical form of the model is expressed as:

$$BOP = f(FD, EXR, FDI, INTR, DTOP, BCDE) \dots\dots\dots (6)$$

where BOP = Balance of Payments,

FD = Fiscal Deficit,

EXR = Exchange Rate,

FDI = Foreign Direct Investment,

INTR =Interest Rate,

DTOP = Degree of Trade Openness,

BCDE = Bank Credit to the Domestic Economy, and

F = Functionality Notation

BOP is the dependent variable while FD, EXR, FDI, INTR, DTOP and BCDE are the explanatory variables.

The econometric form of the model is specified as follows:

$$BOP = a_0 + a_1 FD + a_2 EXR + a_3 FDI + a_4 INTR + a_5 DTOP + a_6 BCDE + U \dots\dots\dots (7)$$

where  $a_0$  is the regression intercept,  $a_1 - a_6$  are the coefficients of the explanatory variables while U is the random variable. All other terms are as earlier defined.

Transforming equation (7) into a logarithmic form, we have:

$$BOP = a_0 + a_1 FD + a_2 EXR + a_3 LFDI + a_4 INTR + a_5 DTOP + a_6 LBCDE + U \dots\dots\dots (8)$$

where L = the natural logarithm of the variables where applicable. All other variables are as earlier defined.

**Model II: External Reserves Model**

The functional form of the model is specified as follows:

$$EXTR = f(FD, EXR, FDI, INTR, DTOP, BCDE) \dots\dots\dots (9)$$

where EXTR = External reserves.

EXTR is the dependent variable. All other variables are as earlier defined.

The ordinary least squares (OLS) multiple regression equation base on the above functional relation is expressed as:

$$EXTR = B_0 + B_1 FD + B_2 EXR + B_3 FDI + B_4 INTR + B_5 DTOP + B_6 BCDE + \varepsilon \dots\dots\dots (10)$$

where  $B_0$  is the regression constant,  $B_1 - B_6$  are the coefficients of the explanatory variables and  $\varepsilon$  is the random variable. All other variables are as earlier defined.

A logarithmic transformation of equation (10) gives us the following:

$$\text{LEXTR} = B_0 + B_1 \text{FD} + B_2 \text{EXR} + B_3 \text{LFDI} + B_4 \text{INTR} + B_5 \text{DTOP} + B_6 \text{LBCDE} + \varepsilon \dots (11)$$

where L = the natural logarithm of the variables where application. All other variables are as earlier defined.

#### Apriori Theoretical Expectations

On apriori theoretical ground, we expect the following signs of the parameter estimates.

**Model I:** Balance of payment Model

$$a_1 < 0, a_2 > 0, a_3 > 0, a_4 < 0, a_5 > 0, a_6 > 0$$

**Model II:** External Resources Model

$$B_1 < 0, B_2 > 0, B_3 > 0, B_4 < 0, B_5 > 0, B_6 > 0$$

#### Nature and Sources of Data

This study made use of annual time-series for the period 1986 to 2021. The data were obtained from secondary sources such as the Central Bank of Nigeria annual statistical bulletin for 2021 and the Central Bank of Nigeria annual reports and statements of account for various years.

#### Techniques of Data Estimation

Since the study made use of time-series data, there was the need to check whether the series are stationary or not, and to determine their order of integration. To this end, the Phillips – Perron unit root test was used to conduct the stationarity test. Based on the result of the unit root test, the autoregressive distributed lag (ARDL) approach was used in estimating the specified models. The Granger causality test was used to test the presence and direction of causalities among the variabl

**PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS****Presentation of Results****Descriptive Statistics Results**

The results of the descriptive statistics are presented in table 1

**Table 1: Descriptive Statistic Results**

Variable	BOP	EXTR	FD	EXR	FDI	DTOP	INTR	BCDE
Mean	-3699.851	21002.92	-691.0176	121.4721	426427.1	333.1035	18.75382	5186.582
Median	-1475.910	13685.31	-147.4000	123.3750	238434.5	339.8400	17.97000	1364.635
Maximum	1124157.	53000.36	3309.400	358.8000	1360276.	555.7300	29.8000	20373.49
Minimum	-563483.9	1441.000	6171.800	4.19000	2028.000	168.4400	12.32000	17.53000
Std. Dev.	238046.6	17107.61	1608.527	101.6287	442905.4	90.67966	3.574467	6345.882
Skewness	2.840147	0.341788	-1.477187	0.673847	0.582435	0.103690	1.219931	0.934577
Kurtosis	16.91322	1.565364	7.197343	2.594286	1.914832	2.716077	4.771609	2.484822
Jarque-Bera	319.9449	3.577730	37.32351	2.806252	3.590560	0.175126	12.87965	5.325460
Probability	0.000000	0.167150	0.000000	0.245827	0.166081	0.916161	0.001597	0.069758
Sum	-125794.9	7140991.1	23494.60	4130.050	1449852	11325.52	637.6300	176343.8
Sum Sq. Dev.	1.87E+12	9.66E+09	85382833	340837.1	6.47E+12	271352.4	421.6348	1.33E+09
Observations	36	36	36	36	36	36	36	36

**Source: Computed from E-view**

The description statistics results in table 1 indicated that FDI with a standard deviation value of 442905.4 is the most unstable variable while INTR with a standard deviation value of 3.574467 is the most stable variable. The Skewness statistic shows that BOP, EXTR, EXR, FDI, DTOP, INTR and BCDE are positively skewed while FD is negatively skewed. The kurtosis statistic indicated that EXTR, EXR, FDI, DTOP and BCDE are platykurtic (i.e., their values less than 3). This implies that their distributions have lighter tails relative to normal distribution. On the other hand, BOP, FD and INTR are leptokurtic (i.e., their values greater than 3). This means that their distributions have heavier tails relative to normal distribution.

**Unit Root Test Result**

The result of the Phillips-Perron unit root test is presented in table 2.

**Table 2: Phillips-Perron Unit Root Test Result**

Variable	At Levels			At First Difference			Order of integration
	Phillips-Perron test Statistic	1% Critical Value	5% Critical Value	Phillips-Perron Test Statistic	1% Critical Value	5% Critical Value	
BOP	-2.305162	-3.639407	-2.951125	-6.865983*	-3.646342	-2.954021	I (1)
LEXTR	-1.668566	-3.639407	-2.951125	-6.271704*	-3.646342	-2.954021	I (1)
FD	-2.596010	-3.639407	-2.951125	-9.880889*	-3.646342	-2.954021	I (1)
EXR	-1.565874	-3.639407	-2.951125	-5.347979*	-3.646342	-2.954021	I (1)
LFDI	-2.506545	-3.639407	-2.951125	-11.43435*	-3.646342	-2.954021	I (1)
LDTOP	-5.071923*	-3.639407	-2.951125				I (0)
INTR	-4.598494*	-3.639407	-2.951125				I (0)
LBCDE	-1.840408	-3.646342	-2.954021	-5.561697*	-3.653730	-2.957110	I (1)

**Source: Computed from E-view**

**Note: \*denotes rejection of the null hypothesis of unit root at the 1% significance level**

The Phillips-Perron unit test result in table 2 shows that DTOP and INTR are stationary at levels (i.e., I(0)) while BOP, LEXTR, FD, EXR, LFDI and LBCDE are stationary at first difference (i.e., I(1)). All the variables are stationary at the 1 percent level of significance.

**ARDL Bounds Test Results**

The results of the ARDL bounds tests approach to cointegration for the two models are presented tables 3A and 3B.

**Table 3A: ARDL Bounds Test Result for the Balance of Payments Model**

F-Bounds Test	Null Hypothesis: No Long-Run relationship			
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	8.151030	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Computed from E-view

**Table 3B: ARDL Bound Test Result for the External Reserves Model**

F-Bounds Test	Null Hypothesis: No Long-Run relationship			
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	9.257178	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Computed from E-view

From the bounds tests results in tables 3A and 3B, the computed F-statistic values of 8.151030 and 9.257178 are greater than the upper bound critical value of 3.28 at the 5 percent level of significance. Based on the result, the null hypothesis of no long-run relationship is rejected. It is therefore concluded that there exist long-run relationships in the ARDL models for balance of payments and external reserves.

### Estimated Long-Run Regression Results

The ARDL estimated long-run regression results for the balance of payments and external reserves models are presented in tables 4A and 4B respectively.

**Table 4A: ARDL Estimated Long-Run Regression Result for the Balance of Payment Model.**

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variables	Coefficient	Std. Error	t-statistic	Prob.
FD	-682.4798	289.5165	-2.357309	0.0380
EXR	-1293.197	1535.315	-.0842301	0.4176
LFDI	131971.3	154901.2	0.851971	0.4124
DTOP	937656.1	346750.6	2.704122	0.0205
INTR	-5623.566	24670.15	-0.227950	0.8239
LBCDE	136705.5	169859.0	0.804818	0.4380
C	-4979739	2199977	-2.263542	0.0448
EC= BOP - (-682.4798*FD - 1293.1966*EXR + 131971.369* LFDI + 937656.1159* LDTOP- 5623.5662* INTR + 13705.5148* LBCDE - 4979739.2968)				

Source: Computed from E-view

**Table 4B: ARDL Estimated Long-Run Regression Result for the External Reserves Model**

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variables	Coefficient	Std. Error	t-statistic	Prob.
FD	-0.023463	0.048093	-0.48759	0.6430
EXR	-0.058138	0.120233	-0.483541	0.6459
LFDI	2.530391	5.528642	0.457688	0.6633
LDTOP	35.18482	72.91020	0.482577	0.6465
INTR	-2.240477	4.910813	-0.456233	0.6643
LBCDE	3.330076	6.431541	0.517773	0.6231
C	137.8210	272.1054	0.506498	0.6306
EC= LEXTR – (0.0235*FD-0.0581*EXR + 2.5304* LFDI + 35.1848* LDTOP - 202405*INTR + 3.3301* LBCDE + 137.8210)				

Source: Computed from E-view

### Estimated Short-Run Regression Results

The estimated short-run (error correction model) regression results for the balance of payments and external reserves models are presented in table 5A and 5B respectively

**Table 5A. Estimated Short-Run Regression Result for the Balance of Payments Model**

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variables	Coefficient	Std. Error	t-statistic	Prob.
D (FD)	-33.90495	18.34869	-2.120312	0.0575
D (FD (-1))	472.7647	54.77232	8.631454	0.0000
D (FD (-2))	255.5419	33.49659	7.628893	0.0000
D (EXR)	-5916.091	1419.986	-4.166303	0.0016
D (LFDI)	150777.2	32913.95	4.580952	0.0008
D(LFDI(-1))	449255.0	43651.15	10.29194	0.0000
D(LFDI(-2))	366577.3	36852.28	9.947208	0.0000
D(DTOP)	573495.0	128930.7	4.448087	0.0010
D(DTOP(-1))	118399.7	111431.2	1.062536	0.3108
D(DTOP(-2))	-37390.91	106358.4	-0.351556	0.7318
D(INTR)	19124.23	9450.776	2.023562	0.0580
D(LBCDE)	191574.6	137145.6	1.396870	0.1900
D(LBCDE(-1))	-129529.6	120361.8	-1.076169	0.3049
CointEq(-1)	-0.689874	0.091700	-7.532163	0.0000
R-squared	0.809117	Mean dependent var		647.9762
Adjusted R-squared	0.703479	S.D. dependent var		362156.9
S.E. of regression	143279.3	Akaike info criterion		26.88261
Sum squared resid	3.70E+11	Schwarz criterion		27.52387
Log likelihood	-416.1218	Hannan-Quinn criter		27.09517
Durbain Waston stat.	2.036760			

Source: Corrupted from E-view

From the ECM result in table 5A, the error correction variable (i.e., CointEq (-1)) turned up with a correct negative coefficient and it is also significant at the 0.05 level of significance. In term of magnitude, the coefficient of the error correction term is -0.689874. This implies that about 68 per cent of any disequilibrium in the short-run is reconciled to long-run (stable equilibrium) model of balance of payment within a year.

**Table 5B: Estimated short-Run Regression Result for the External Reserves Model**

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variables	Coefficient	Std. Error	t-statistic	Prob.
D (FD)	9.33E-05	1.56E-05	5.981016	0.0010
D (FD (-1))	0.001133	8.59E-05	13.18834	0.0000
D (EXR)	-0.011855	0.001526	-7.767031	0.0002
D (EXR(-1))	0.002906	0.001213	-2.394625	0.0537
D(LFDI)	0.300011	0.036788	8.155321	0.0002
D(LFDI(-1))	0.544167	0.060839	8.944348	0.0001
D(LFDI(-2))	0.428047	0.046877	9.131290	0.0001
D(DTOP)	1.314475	0.125315	10.48939	0.0000
D(DTOP(-1))	0.732967	0.082867	8.845088	0.0000
D(DTOP(-2))	0.151837	0.093236	1.628516	0.1545
D(INTR)	-0.025332	0.009059	-2.796463	0.0313
D(INTR(-1))	0.059909	0.009558	6.268043	0.0008
D(LBCDE)	0.229555	0.100407	2.286243	0.0523
D(LBCDE(-1))	0.826806	0.113959	7.255299	0.0003
CointEq(-1)	-0.603358	0.050002	-12.06667	0.0000
R-squared	0.893818	Mean dependent var		0.074144
Adjusted R-squared	0.839580	S.D. dependent var		0.410447
S.E. of regression	0.100890	Akaike info criterion		-1.457329
Sum squared resid	0.132323	Schwarz criterion		-0.624691
Log likelihood	40.58859	Hannan-Quinn criter		1.185910
Durbin Watson Stat.	2.830058			

**Source: Computed from E-view**

From the estimated short-run result in table 5B, the error correction variable turned up with the right negative coefficient. It is also significant at the 0.05 level of significance. The error correction term has a coefficient of -0.603358. The implication is that any disequilibrium in the short-run is adjusted back to long-run equilibrium trend with a speed of adjustment of about 60 per cent within a year.

### Granger Causality Tests Results

The results of the Granger causality tests for the balance of payments and external reserves models are presented in tables 6A and 6B respectively.

**Table 6A: Granger Causality Test Result for the Balance of Payment Model****Lags: 2**

Null Hypothesis	Obs	F-Statistic	Prob.
FD does not Granger cause BOP	33	0.03992	0.9609
BOP does not Granger cause FD		0.00286	0.9971
LFDI does not Granger cause BOP	33	0.56779	0.5732
BOP does not Granger cause LFDI		0.81269	0.4539
EXR does not Granger cause BOP	33	0.67204	0.5187
BOP does not Granger cause EXR		0.23983	0.7884
INTR does not Granger cause BOP	33	0.76221	0.4761
BOP does not Granger cause INTR		0.13813	0.8716
DTOP does not Granger cause BOP	33	1.60626	0.2186
BOP does not Granger cause DTOP		0.46666	0.6319
LBCDE does not Granger cause BOP	32	0.05834	0.9435
BOP does not Granger cause LBCDE		0.02255	0.9777

**Source: Computed from E-view****Table 6B: Granger Causality Test Result for the External Reserves Model****Lags: 2**

Null Hypothesis	Obs	F-Statistic	Prob.
FD does not Granger cause LEXTR	33	1.63793	0.2125
LEXTR does not Granger cause FD		1.96979	0.1583
LFDI does not Granger cause LEXTR	33	5.57727	0.0091
LEXTR does not Granger cause LFDI		7.58455	0.0023
EXR does not Granger cause LEXTR	33	2.54752	0.0963
LEXTR does not Granger cause EXR		1.62036	0.2158
INTR does not Granger cause LEXTR	33	0.03113	0.9694



LEXTR does not Granger cause INTR		2.84546	0.0750
DTOP does not Granger cause LEXTR	33	0.07043	0.9322
LEXTR does not Granger cause DTOP		0.81700	0.4520
LBCDE does not Granger cause LEXTR	32	0.41799	0.6626
LEXTR does not Granger cause LBCDE		3.29565	0.0524

**Source: Computed from E-view**

### Post-Estimation Tests

The classical linear regression model (CLRM) is based on certain assumptions. There is the need to test these assumptions so as to validate the results. These assumption are tested in this section. The results and decisions for the post-estimation tests for the two models are presented in table 7.

**Table 7: Post Estimation Tests Results**

<b>Tests for Balance of Payments Model</b>			
<b>Tests</b>	<b>Value</b>	<b>Prob.</b>	<b>Decision</b>
Linearity (Ramsey Reset) test t-statistic	2.942330	0.1047	Accept (model correctly specified)
F-statistic	8.657308	0.1047	
Breusch-Godfrey Serial Correlation LM Test F-statistic	1.460999	0.2623	Accept (No serial correlation). That is no auto correlation
Heteroscedasticity (Breusch-Pagan-Godfrey) Test F-Statistic	1.460999	0.2625	Accept (Residuals have constant variance)
Normality (Jarque-Bera) test F-statistic	0.493844	0.781202	Accept (Data normally distributed)
<b>Tests for External Reserves Model</b>			
Linearity (Ramsey Reset) Test t-statistic	1.082974	0.3283	Accept (Model correctly specified)
F-statistic	1.17283A	0.3283	
Breusch-Godfrey Serial Correlation LM Test F-statistic	1.762229	0.2828	Accept (No serial correlation)
Heteroscedasticity (Breusch-Pagan-Godfrey Test F-statistic	0.773048	0.7023	Accept (Residuals have constant variance)
Normality (Jarque-Bera) Test F-statistic	0.4751474	0.788537	Accept (Data normally distributed)

**Source: Computed from E-view**

## DISCUSSION OF FINDINGS

The results presented in the previous section are discussed here in detail.

### Balance of Payments Model

#### **Estimated Long-Run Regression Result.**

The estimated long-run regression result for the balance of payments model indicated that fiscal deficit has significant negative impact on balance of payment while exchange rate and interest rate have insignificant negative impact on balance of payments. On the other hand, degree of trade openness has significant positive impact on balance of payments while foreign direct investment and bank credit to the domestic economy have insignificant positive impact on balance of payments

#### **Estimated Short-Run Regression Result**

The short-run regression result for the balance of payments model showed that fiscal deficit in the current period has significant negative impact on BOPs while its lagged values in periods 1 and 2 have significant positive impact on BOPs. Exchange rate in the current period has significant negative impact on BOPs. Foreign direct investment in the current period and its lagged values in periods 1 and 2 have significant positive impact on BOPs. Degree of trade openness has significant positive impact on BOPs while its value lagged by one period has insignificant positive impact on BOPs. However, the lagged value of degree of trade openness in period 2 has insignificant negative impact on BOPs. Interest rate in the current period has significant positive impact on BOPs. Bank credit to the domestic economy has insignificant positive impact on BOPs while its value lagged by one period has insignificant negative impact on BOPs

The coefficient of multiple determination (R-squared) is 0.809117. This means that the explanatory variables jointly account for about 80 percent of the total variations in BOPs in Nigeria. The adjusted R-squared is 0.743479. This means that if additional explanatory variables are introduced into the model, the R-squared will reduce to about 74 percents. The Durbin-Watson statistic is 2.036760. This implies that the model is not affected by the problem of autocorrelation.

#### **External Reserves Model**

##### i. Estimated long-Run Regression Result.

The estimated long-run regression result for the external reserves model showed that fiscal deficit, exchange rate and interest rate have insignificant negative impact on external reserves. On the other hand, foreign direct investment, degree of trade openness and bank debit to the domestic economy have insignificant positive impact on external reserves.

##### ii. Estimated Short-Run Regression Result

The short-run regression result for the external reserves model indicated that fiscal deficit in the current period and its one-period lag have significant positive impact on external reserves. Exchange rate in the current period and its lagged value in period one have significant negative impact on external reserves. Foreign direct investment in the current and its lagged values in period one and two have significant positive impact on external reserves. Degree of trade openness in the current period and its lagged value in period one have significant positive impact on external reserves while its lagged value in period 2 has insignificant positive impact on external reserves. Interest rate in the current period has significant negative impact on external reserves while its lagged value in period 1 has significant positive impact on external reserves. Credit to the domestic economy in the current period and its value lagged by one period have significant positive impact on external reserves.

The R-squared is 0.893818. Hence, the explanatory variables are jointly responsible for about 89 percent of the total variations in external reserves. The adjusted R-squared is 0.839580. The Durbin –Watson statistic is 2.830058 implying that the model is not affected by the problem of autocorrelation.

The Granger causality test result for the balance of payments model indicated that there is no causality between balance of payments and any of the explanatory variables. For the external reserves model, the Granger causality test result showed bidirectional between foreign direct investment and external reserves, and a unidirectional causality from external reserves to bank credit to the domestic economy.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

Based on the finding from the study, the following conclusions are drawn.

- (i) Recall that the IMF recommended that developing countries should reduce fiscal deficit as to improve the balance of payments performance. Therefore, since the study showed that fiscal deficit has negative impact on the performance of Nigeria’s external sector, we therefore conclude that the IMF recommendation with regard to fiscal deficit is relevant and beneficial to the Nigerian economy.
- (ii) The IMF recommends that the official exchange rate should be devaluated. However, the results of the study showed that exchange rate has negative impact on the performance of Nigeria’s external sector. This implies that currency devaluation will worsen the performance of the external sector. We therefore conclude that IMF recommendation concerning currency devaluation will not be relevant and beneficial to Nigeria’s external sector development.
- (iii) The study established that foreign direct investment has positive impact on external sector performance. Also, the IMF recommends that the domestic economy should be opened to foreign

investments. Based on our finding, it is therefore concluded that the IMF recommendation concerning foreign direct investment is relevant to the Nigeria's external sector performance

(iv) With regard to degree of trade openness, the findings showed that trade openness has positive impact on external sector development. The IMF also recommends that the domestic economy should be opened to international trade. Therefore, we conclude that IMF recommendation concerning foreign trade is relevant and beneficial to Nigeria's external sector performance.

(v) It is established from the study that interest rate has negative impact on external sector development. However, the IMF recommends that the interest rate should be raised to reduce bank credit expansion. We therefore conclude that the outcome of this study with regards to interest rate is not in support of IMF recommendation.

(vi) Concerning bank credit to the domestic economy, our findings showed that it has positive impact on external sector development. But the IMF recommends credit control in order to curb inflationary pressure. Our conclusion is that the outcome of the study on bank credit to the domestic economy does not support IMF recommendations.

### **Policy Recommendations**

Based on the conclusions drawn from the study, the following policy measures are recommended.

(i) There is the need for the Nigerian government to reduce its reliance on deficit financing in line with the IMF recommendation. To achieve this, there is the need for the government to broaden its fiscal space by exploring and exploiting alternative sources of revenue apart from oil.

(ii) Instead of deliberately devaluing the naira in order to improve external sector performance, the government should allow market forces to determine the exchange rate to a large extent. In other words, the country should adopt a managed floating exchange rate policy.

(iii) The Nigerian government should encourage the inflow of foreign investments in line with the IMF recommendation. To this end, policies that will make the country's macroeconomic environment to be more conducive to foreign investments should be implemented.

(iv) In line with the IMF recommendation, Nigeria should open up the economy to international trade. However, to benefit from the increased trade openness, the country should improve the capacity of the economy to produce more quality products that will be competitive in the international market.

(v) The interest rate should be lowered to enable investors get access to loanable funds.

(vi) The government through the Central Bank of Nigeria should encourage the banks to grant more credit to private sector investors. In other words, credit to the domestic economy should be increased. Also, through special directives, the CBN should advise the banking sector to direct more credit to preferred sectors of the economy.

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