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Research Paper

Selected Macroeconomic Performance IndicatorsandBalance of Payments Stability inNigeria

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ABSTRACT:*The study analyzed the relationship between selected macroeconomic performance indicators and the balance of payments in Nigeria. A BOP model was constructed and estimated for the Nigerian economy. In line with recent development in time series modeling, unit root test, test for cointegration, and error correction representation were performed using Nigerian data.* Furthermore, post-analysis diagnostics (serial correlation, stability and normality) tests were also conducted. *The cointegration results confirm that the BOP cointegrates with exchange rate, external debt, real gross domestic product, and foreign direct investment. This finding suggests that balance of payments instability in Nigeria could be explained by changes in these variables. The study recommends that to stabilize the BOP and put the Nigerian economy on the path of sustainable growth, the government has to reduce fiscal deficits, encourage private investment, and also design measures that would induce foreign direct investment, as these would stimulate non-oil exports, and address the external debt problem.*

KEYWORDS*-Macroeconomic Performance, Balance of Payments, Exchange Rates, External Debt, Stability.*

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I. INTRODUCTION

A community of world economies has been created due to improvements in transportation and communication facilities and global markets for goods and services. World trade, international investment, and flows of money between nations have deepened in the past few decades due to globalization and privatization. Consequently, the economic and financial systems of individual countries have become more interdependent.Almost all economies of the world have become more open. They export and import more. Small countries tend to be the most open of all, larger countries try less so, since it is rather easier for them to be more self-sufficient. Increasing openness has resulted from increasing exploitation of comparative advantage. As countries develop, they discover new and competitive ways of exploiting their resources. Exports expand. The income they earn can be spent on more imports. No real world economy exists in autarky. That is, every economy is an essential part of the world economy. This increasing openness has resulted from increasing exploitation of comparative advantage. Every country buys goods produced in other countries and also sells what it produces to other countries. This entails the exchange of goods and services across national boundaries using foreign currencies and is known as international trade. International trade is growing faster than domestic production and income almost everywhere in the world. The world economy is becoming fiercely competitive, but the rush of global events opens up opportunities as well. Specialized production and exchange yields enormous benefits. There is a general consensus among economists that openness to international trade stimulates economic growth and development. The export-led growth strategy is seen to be the channel through which sustained trade can become the engine of economic growth. The record that summarizes such international transactions is known as the balance of payments.

The Balance of Payments (BOP) is a comprehensive record of economic transactions of the residents of a country with the rest of the world during a given period of time. The record is so prepared as to provide meaning and measure to the various components of a country's external economic transactions. Therefore, the aim is to present an account of all receipts and payments with regards to goods exported, services rendered and capital received by residents of a country, and goods imported, services received and capital transferred by

residents of the country. The balance of payments of a country may be in balance in the sense of equality between total payments and total receipts. More generally, however, it shows either a surplus or a deficit. A country is said to have a deficit in its BOP if it has recorded a negative overall balance for the relevant period. But, if it has recorded a positive overall balance, it is said to have a surplus in the BOP. The BOP has three main parts. They are the current account, the capital and financial account, and the net errors and omission section. These records are maintained in order is to inform government of the international economic position of the country and to help it in making useful decisions on monetary and fiscal policy on the one hand, and trade and payments questions on the other.

The balance of payments mirrors the relative strength of a country's economy vis-à-vis her trading partners' economies. An analysis of the balance of payments is important because of its relationship with other sectors of the economy. Specifically, it occupies a unique place in the formulation and implementation of macroeconomic policies. In order to implement appropriate policy measures to improve the performance of the balance of payments, it is important to determine trends in the major determinants of the balance of payments performance. Some of these determinants are the exchange rates, external debt, real gross domestic product and foreign direct investment.

Nigeria's Balance of Payments has been under severe pressure since 1982 when the second oil shock occurred and debt burden became pronounced (Olisadebe, [1]). A close relationship exists between foreign exchange transactions and the balance of payments. While foreign exchange transactions reflect cash flow arising from international operations, the balance of payments look at the actual movement of goods, services, financial assets and liabilities(Obaseki, [2] andSobodu&Sotonwa, [3]). Using empirical trade experiences inmost Less Developed Countries (LDCs), Ayodele [4], Brada and Mende [5], Olopoena [6], were able show how countries with floating exchange rates achieved balance of payments equilibrium through exchange rate adjustments. Within a macroeconomic framework, certain basic relationships among key macroeconomic aggregates indicate the impact of the change in one variable on the other variables, and by implication, on the entire economy. Thus, with such a macroeconomic framework, it can be deduced that there is a close link between the exchange rates, external debt, real gross domestic product, foreign direct investment and the balance of payments.

It is therefore the focus of this study to find the causes of Balance of Payments fluctuation in Nigeria and suggest various ways of ameliorating this recurring phenomenon. To do this, the study is organized as follows: Section 2 provides the theoretical and empirical review of related literature. Section 3 is devoted to model specification, estimation techniques and procedures, and empirical investigation. Section 4 presents the concluding remarks.

II. THEORETICAL AND EMPIRICAL REVIEW

Theoretically, the conventional view of the BOP states that a nominal devaluation of currency will improve the balance of payments position. This view is rooted in the static and partial equilibrium approach to BOP determination, and is known as the Elasticity Approach (Duasa, [7]). This view is based on the substitution effects in consumption and production, necessitated by changesin relative prices (domestic versus foreign),as a result of devaluation. The model has been recognized in the literature as providing sufficient condition for improvements in the BOP as exchange rates are devalued.

In the early 1950s, authors such as Harberger [8], Meade [9], and Alexander [10]put forth a different approach to the BOP by shifting focus of economic analysis to the BOP. This approach is known as the absorption approach.The main tenet of this approach is the position that any improvement in trade balance requires an increase in income over total domestic expenditures. In other words, the absorption approach analyzes the economy from the view point of aggregate expenditures, in particular, the direct effect of exchange rates changes on relative prices, income and absorption, and ultimately on the balance of trade.

The monetary view of the BOP emerged towards the end of the 1950s. This approach emphasizes the fact that the BOP is essentially a monetary phenomenon (see Polak, [11] and Mundell, [12]). The BOP behaviouris analyzed from the point of view of the supply of, and the demand for money. In very simple terms, if the demand for money in an economy is more than its supply by the Central Bank, then the excess demand for money would be satisfied by inflows of money from abroad. In this case, the balance of payments will improve. On the other hand, if the Central Bank supplies more money than is demanded by the public, the excess supply of money is eliminated by outflows of money to other countries and this would worsen the balance of payments.

In an attempt to identify the causes of BOP fluctuation in Nigeria, the vulnerability of the economy to external shocks, external debt burden and debt servicing issues, exchange rate movements, and the level of inflow of foreign direct investment have remained the focal issues. Adjustments in the BOP through exchange rate variation rely upon the effect of the relative prices of domestic and foreign goods on the trade flows with the world (Thrillwall, [13]). This relative price, or terms of trade is defined by the ratio of export and import

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prices in domestic currency from the point of view of the country as a whole. It is the amount of imports that can be obtained in exchange for a unit of exports or the amount of exports required to obtain one unit of import. Variation in the terms of trade can be caused by changes in the prices expressed in the respective national currencies and alsoby exchange rate changes. Thrillwall [13] posits that a depreciation or devaluation in the exchange rate, at unchanged domestic and foreign prices in the respective currencies, makes domestic goods cheaper and more competitive on the international market and foreign goods more expensive in the domestic market.

Gbanador [14], contends that devaluation tends to make imports more expensive in domestic currency terms, which are not matched by a corresponding rise in export prices. This implies that the terms of trade will deteriorate. Deterioration in the terms of trade represents a loss of real national income and can lead to BOP crisis because more units of exports have to be given to obtain a unit of imports. Consequently, the terms of trade effects caused by devaluation lowers income. A devaluation of currency causes an increase in the import prices, and as a result, domestic prices jump. This leads to a reduction in the real value of wealth held in monetary form such that the real value of cash balance is reduced leading to unfavourable BOP.

Nigeria's external debt burden and servicing over the years have been blamed by several scholars and commentators on the economy for the negative profile of the country's BOP. Clearly, the Nigerian external debt obligation has been large and the interest payable kept rising over years. The implication of this circumstance is that debt service expenditure reduces wealth and the resources available to improve the country's economic activities, and this is detrimental to the BOP.If there is an increase in external debt, this would contract public saving and, since private saving is unlikely to rise as much as the rate of decrease in public saving, total national saving and investment would decline. The decline in investment would lead to slower growth in capital stock and potential output, and hence, the BOP.

In much of literature, Foreign Direct Investment (FDI), a key external sector variable, is seen as stimulating economic growth, and hence, the BOP. Khan, [15], analyzed FDI and economic growth: the role of the domestic financial sector, and found that FDI stimulates economic growth in both the short-run and long-run. In a similar study on the Indian economy, by Ray [16], a positive relationship was discovered between FDI and economic growth. A long-run relationship was also found to exist between the variables.

Berasaluce and Romero [17], analyzed economic growth and the external sector of Korea between 1980 and 2015. Exports, imports and Foreign Direct investment (FDI) were isolated as the proxies for the external sector. Evidence from the study suggests that export and FDI do not trigger economic growth in Korea. Nwaeze [18], examined selected external sector variables and macroeconomic stability in Nigeria for the period 1981 to 2016. The Autoregressive Distributed Lag (ARDL) approach was employed. The results revealed a positive and an insignificant relationship between external debt and economic growth, and a negative and insignificant relationship between FDI and economic growth. However, the relationship between exchange rate and growth was positive and significant. Thus, evidence from the study indicates a weak relationship between key external sector variables and economic growth in Nigeria for the period under review.

According to Turnovsky, [19], much of the early literature dealing with the effects of devaluation on the balance of payments restricted itself to the balance of trade (BOT) components. According to him, the 'elasticity approach', as it is called, was concerned with determining the conditions under which devaluation would lead to an improvement in the balance of payments, on the assumption that prices, income and interest rates remain fixed.

The balance of trade (BOT), expressed in terms of domestic currency equals

$$\mathbf{BOT = PX - QEM} \quad \text{----------} \quad (\mathbf{1})$$

$$\mathbf{SettingP = Q = 1, wehave}$$

$$\mathbf{BOT = X(E) - EM(E)} \quad \text{----------} \quad (\mathbf{2})$$

$$\mathbf{X'(E) > 0; M'(E) < 0}$$

Differentiating BOT with respect to E

$$\frac{\mathbf{dBOT}}{\mathbf{dE}} = \mathbf{X'(E) - EM'(E) - M(E)} \quad \text{----------} \quad (\mathbf{3})$$

Assuming that before devaluation, the balance of payments (trade) is in equilibrium, so that

$$X(E) = EM(E)$$

Equation (3) can be written in the elasticity form as

$$\boldsymbol{\varepsilon X + \varepsilon M > 1 - (4)}$$

Where

BOT = Balance of Trade
P = Domestic Price Level
Q = Foreign Price Level
E = Exchange Rate
X = Real Export Demand
M = Real Imports
εX = Price Elasticity of Demand for Exports
εM = Price Elasticity of Demand for Imports

Thus, (4) is the familiar Marshal-Lerner condition, asserting that devaluation will lead to an improvement in the balance of payments (trade) provided the sum of these two elasticities (the price elasticity of demand for exports and the price elasticity of demand for imports) exceeds unity.

Secondly, there is the capital account balance. This section of the balance of payments consists of the net flow of net reserves resulting from domestic residents' purchases of foreign assets and reciprocally, foreigners' investments in the domestic economy. As a first approximation, Turnovsky has specified the relationship as follows:

$$\boldsymbol{K = K(Y, r - F) - (5)}$$

$$\boldsymbol{K_1 > 0; K_2 > 0}$$

Where

Y = Output
K = Net Capital Inflow
F = Foreign (Exogenous) Rate of Interests

Equation (5) is justified on the argument that if the domestic interest rate rises relative to that abroad, foreigners will be encouraged to invest domestically, while domestic residents will also be stimulated to do the same. The net effect of this will be to increase the flow of foreign exchange into the domestic economy. If the interest differential falls, the opposite adjustment will take place.

Equation (5) can be re-written as

$$\boldsymbol{K = K(Y, r) - (6)}$$

Substituting equations (1) and (6) into the definition of the balance of payments, yields

$$\boldsymbol{BOP = PX\left(QE/P\right) - QEM\left(Y, r, QE/P, T\right) + K(Y, r) - - - - - - - - - - (7)}$$

Under the fixed exchange rate regime, E is fixed exogenously at $\bar{E}$ in which case

$$\boldsymbol{BOP = PX\left(Q\bar{E}/P\right) - Q\bar{E}M\left(Y, r, Q\bar{E}/P, T\right) + K(Y, r) - - - - - - - - (8)}$$

and by appropriate choice of units E = 1. With flexible exchange rates the exchange rate adjusts endogenously to maintain the balance of payments in equilibrium.

Hosek [20], had argued that the balance of payments is in equilibrium if the trade balance minus net capital flows equals zero. This requires that a balance of trade surplus be offset by net capital outflow or that a balance of trade deficit be offset by net capital inflows. Hence the argument in equation (7) becomes

$$\mathbf{PX}\left(\mathbf{QE}/_{\mathbf{P}}\right) - \mathbf{QEM}\left(\mathbf{Y}, \mathbf{r}, \mathbf{QE}/_{\mathbf{P}}, \mathbf{T}\right) + \mathbf{K}(\mathbf{Y}, \mathbf{r}) = \mathbf{0} - - - - - - - - - - (\mathbf{9})$$

The theoretical argument in favour of devaluation is that when a country devalues its currency, the value of that currency in terms of other currencies decreases, thus, making it possible for foreigners to buy more of the devaluing country's goods than before, and imports become more expensive (Powell, [21]). Recently, numerous studies have tested the Marshall-lerner condition. Bahmani-Oskooee and Niroomand [22] have tested the Marshall-Lerner condition in 30 developed and developing countries for the period 1960-1992. Gomes and paz [23]) and find the existence of a long-run relationship between the balance of BOP, exchange rates, foreign domestic income, and external debt for Brazil and Malaysia during 1965-2002.

The literature is replete with findings emanating from research works on the effect of the selected macroeconomic variables on economic growth, and hence, the BOP. As can be observed from the foregoing, empirical evidence from a significant number of the studies suggests that improvements in the selected macroeconomic variables improves the BOP.

III. MODEL SPECIFICATION, ESTIMATION TECHNIQUES AND EMPIRICAL INVESTIGATION

3.1 Model Specification

Not much is known about the contemporary relationship existing between BOP and other macroeconomic variables in Nigeria. Hence, the search for a reliable BOP model has continued to be an intensive activity. Our BOP model, therefore, combines the structuralist, monetarist, and fiscalist approaches. Given the structure of the Nigerian economy since financial deregulation and trade liberalization, as well as available empirical evidence on the Nigerian economy and other economies of the world, we specify the following BOPmodel:

$$\mathbf{BOP} = \mathbf{f}(\mathbf{EXR}, \mathbf{EXD}, \mathbf{GDP}, \mathbf{FDI}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{10})$$

The econometric model of the equation is stated in log-linear forms as:

$$\boldsymbol{BOP} = \boldsymbol{b_0} + \boldsymbol{b_1 EXR} + \boldsymbol{b_2 EXD} + \boldsymbol{b_3 GDP} + \boldsymbol{b_4 FDI} + \boldsymbol{\mu t} \ldots\ldots\ldots\ldots (\mathbf{11})$$

The a priori expectations are: $b_1 > 0$; $b_2 < 0$; $b_3 > 0$; and $b_4 > 0$

Where:
BOP = Balance of Payments; EXR = Exchange Rate; EXD = External Debt; GDP = Real Gross Domestic Product; FDI = Foreign Direct Investment; b_0 = intercept; b_1-b_4 = parameter estimates of the explanatory variables; and μ_t = Random error term.

Thus, the error correction model is specified as:

$$\Delta BOP = \alpha_0 + \sum_{i=1}^{a} m_1 \Delta BOP_{t-i} + \sum_{i=1}^{a} m_2 \Delta EXR_{t-i} + \sum_{i=1}^{a} m_3 \Delta EXD_{t-i} + \sum_{i=1}^{a} m_4 \Delta GDP_{t-i}$$

$$+ \sum_{i=1}^{a} m_5 \Delta FDI_{t-i} + \delta ECM_{t-1} + \mu_t + \quad \ldots\ldots\ldots\ldots..(12)$$

α_0= constant parameter; $m_1 - m_5$ = short-run coefficients of the lagged regressors; a = lag length; Δ = first difference operator; ECM = Error Correction Model; δ= coefficient of the ECM; μ_t = Random error term.

3.2 Estimation Techniques and Procedures

The econometric method employed covered the Ordinary Least Squares (OLS) method, the unit root test, the Johansen test for cointegration and the error correction mechanism. Post-analysis diagnostic tests were also conducted. They comprised the Breusch-Godfrey serial correlation LM test, the model stability test (CUSUM test), and the Jarque-Bera normality test. The Unit root test was employed to checkthe stationarity status of each of the variables in the model. We know from theory that if non-stationary time series are estimated at levels, it usually leads to spurious regression or nonsense correlation. Therefore, it is necessary to carry out unit root diagnostic test. the Augmented Dickey-Fuller (ADF) method was utilized for this purpose. The ADF model is stated as:

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$$\Delta W_t = \mu_0 + \mu_1 W_{t-1} + \sum_{i=1}^{K} \phi_i \Delta W_{t-i} + e_t \text{---------- (13)}$$

Where:

W_t= variables under consideration; μ_1 and ϕ_i = parameter estimates of the variables; k = lag length; Δ= First difference operator; and e_t = stochastic error term.

After establishing the stationarity of the data, the Johansen cointegration test was applied. The Cointegration test determines whether a long-run equilibrium relationship exist among the variables or not. Furthermore, the Error Correction Mechanism (ECM) was employed to estimate the short-run parameter estimates of the explanatory variables and the speed of convergence of the model.

3.3 Empirical Investigation

The empirical investigation was carried out in four phases viz: the unit root (stationarity) diagnostics test, the Johansen cointegration test, the ECM analysis, and the post-analysis diagnostic tests (comprising the Breusch-Godfrey serial correlation LM test, the CUSUM stability test, and the Jarque-Bera normality test). The study commences its empirical analysis with the unit root (stationarity) diagnostic test on the time series. The Augmented Dickey-Fuller (ADF) method was employed for this purpose. The results of the ADF test are presented in table 1 below:

Table 1: Results of ADF Unit Root (Stationarity) Test On the Variables (1981-2016)

Variable	ADF Statistic	Prob. Value	1%	5%	10%	Order of Integration	Conclusion
D(BOP)	-5.930026	0.0000	-3.639407	-2.951125	-2.614300	I(1)	Stationary
D(EXR)	-6.278498	0.0000	-3.639407	-2.951125	-2.614300	I(1)	Stationary
D(EXD)	-3.348955	0.0203	-3.639407	-2.951125	-2.614300	I(1)	Stationary
D(GDP)	-5.095495	0.0002	-3.639407	-2.951125	-2.614300	I(1)	Stationary
D(FDI)	-6.997319	0.0000	-3.639407	-2.951125	-2.614300	I(1)	Stationary

Source: Author's computation

The results in table 1 above indicate that all the variables were non-stationary at levels, but, became stationary at first difference. That is, they are all I(1) series.

The results above naturally led us to the test for long-run relationship among the variables, that is, the test for cointegration. Therefore, we conducted a Johansen cointegration test, to check whether or not, our model could survive both the trace and eigenvalue criteria for the existence of a long-run relationship among the variables. The results are presented in tables 2 and 3 below:

Table 2: Johansen Cointegration Test (Trace) Results for BOP Model

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.659914	99.68982	69.81889	0.0000
At most 1 *	0.500686	63.01888	47.85613	0.0010
At most 2 *	0.424060	39.40521	29.79707	0.0029
At most 3 *	0.321804	20.64565	15.49471	0.0076
At most 4 *	0.196603	7.442810	3.841466	0.0064

Trace test indicates 5 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 3: Johansen Cointegration Test (Maximum Eigenvalue) Results for BOP Model

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**

None *	0.659914	36.67094	33.87687	0.0226
At most 1	0.500686	23.61367	27.58434	0.1488
At most 2	0.424060	18.75956	21.13162	0.1040
At most 3	0.321804	13.20284	14.26460	0.0731
At most 4 *	0.196603	7.442810	3.841466	0.0064

Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The results obtained using the trace and maximum eigenvalue statistic indicate the existence of a long-run relationship among the variables. This led to the rejection of the hypothesis of no cointegration. Cointegration is a prerequisite for the error correction mechanism. Since cointegration has been established, it is pertinent to proceed to the error correction model. The first step in ECM is developing an over-parameterized model with the gradual elimination of the insignificant coefficients so as to obtain the parsimonious model. The results of the parsimonious error correction representation for BOP model are presented in Table 4 below.

Table 4: Results of the Parsimonious Model {Dependent Variable = D(BOP)}

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.681997	4.884876	1.367895	0.1903
D(BOP(-1))	-1.201826	0.241250	-4.981666	0.0001
D(BOP(-2))	-0.337478	0.168991	-1.997013	0.0631
D(EXR(-1))	26777.73	7380.017	3.628410	0.0023
D(EXR(-4))	-9980.381	5219.428	-1.912160	0.0739
D(EXD)	-903.7888	139.8376	-6.463131	0.0000
D(EXD(-1))	300.8534	132.0503	2.278324	0.0368
D(EXD(-3))	255.3169	137.3389	1.859028	0.0815
D(EXD(-4))	851.9108	154.5254	5.513080	0.0000
D(GDP(-1))	-356.0390	104.6265	-3.402952	0.0036
D(GDP(-2))	134.6162	81.74560	1.646770	0.1191
D(GDP(-5))	166.6671	81.57326	2.043159	0.0579
D(FDI(-1))	-132837.3	73516.27	-1.806911	0.0896
ECM(-1)	0.504956	0.201154	2.510290	0.0232

R^2 = 0.87; Adj. R^2 = 0.76; F-statistic = 8.06; Prob(F-statistic) = 0.0001

Source: Author's computation

The results of the parsimonious ECM above show that the lagged values of BOP have negative relationship with the current level of BOP. BOP at lag one is statistically significant, suggesting that the current value of BOP can also be explained by its past value.

The coefficient of EXR at lag 1 appears with a positive sign and is statistically significant even at 1 percent level. This result suggests that a positive relationship exists between BOP and EXR. That is, an increase in the exchange rate of the naira to the dollar would lead to an improvement in the BOP. This result conforms to apriori expectation. In theory, a depreciation or devaluation (increase in the exchange rate) of the domestic currency against the currencies of major trading partners is expected to stimulate local production. This increase in the exchange rate of the domestic currency is supposed to make goods produced domestically cheaper on the international market, and hence, more competitive. The resultant increase in foreign demand is expected to stimulate domestic production and improve the BOP, ceteris paribus. In this connection, and stemming from the results above, an increase in EXR would lead to an increase in BOP. However, the coefficient of EXR at lag 4 is not statistically significant at 5 percent level and also appears with the wrong sign.

The coefficients of EXD at lags 1 and 4 have a positive sign and are also significant at 5 percent significance level. These result are the short-run results and they conform to economic theory which postulates a positive relationship between EXD and production, and hence, BOP, in the short-run. In the short-run, higher external debt arising from government deficit budgeting tends to increase aggregate demand, stimulate productive activities, lower unemployment, and improve the BOP. This is the Keynesian impact of fiscal policy which operates by increasing actual output relative to potential output. The coefficient of the contemporaneous

value of EXD is also statistically significant but negatively signed. However, that of lag 3 is statistically insignificant.

GDP at lag 1 exerts a statistically significant but negative relationship on BOP. However, lags 2 and 5 are positively related to BOP but statistically insignificant. The coefficient of FDI at lag 1 appears with a negative sign and is statistically insignificant at 5 percent level. The coefficient of ECM is significant at 5 percent level of significance and is rightly signed. This further confirms the Johansen test results that the variables in the model are indeed cointegrated. Specifically, the ECM results show that the BOP model has about 50 percent speed of convergence or adjustment. That is, on annual basis, 50 percent of disequilibrium would be reconciled.

The results also suggest that the BOP model has a high fit, with a coefficient of determination, R^2 value of 0.87. This shows that the exogenous variables in the model explain 87 percent of total variation in BOP in Nigeria, and the remaining 13 percent are explained by variables not included in the model. Furthermore, the F-statistic of 8.06, with its probability value of 0.0001, provides basis to logically conclude that the overall results obtained are statistically significant.

As aforementioned, post-analysis diagnostic tests were also conducted. They comprised the Breusch-Godfrey serial correlation LM test, the model stability test (CUSUM test), and the Jarque-Bera normality test. The results are presented below:

Table 5: Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.442475	Prob. F(2,14)	0.2694
Obs*R-squared	5.125778	Prob. Chi-Square(2)	0.0771

Source: Author's computation

The Breusch-Godfrey Serial Correlation LM testresults above show evidence that the residual of the Error Correction Model (ECM) is not serially correlated. As can be observed, the corresponding p-value of the observed R^2, of 0.0771 (7.7%), is greater than 5 percent.

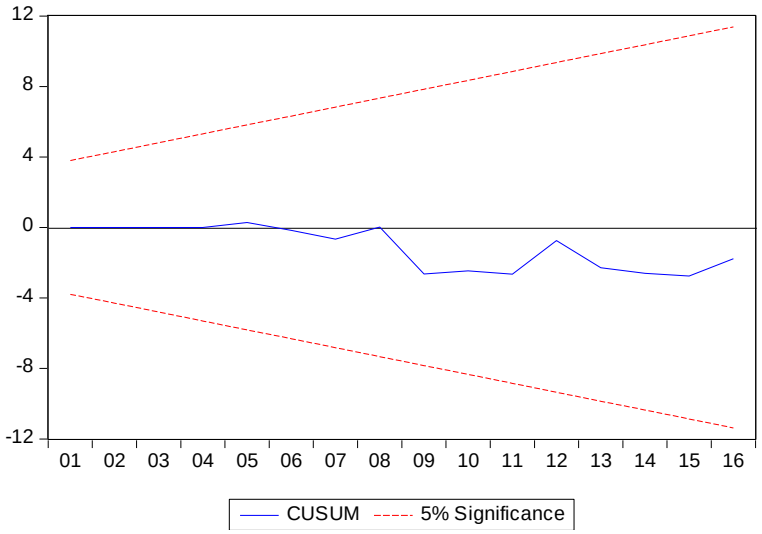

Figure 1: Model Stability Test (CUSUM Test)

Source: Author's Analysis

The results of the model stability test above, suggest that the model is stable. Stability of the model requires that the cumulative sum of squares stays within the 5 percent critical bound represented by the two red lines in the chart above.

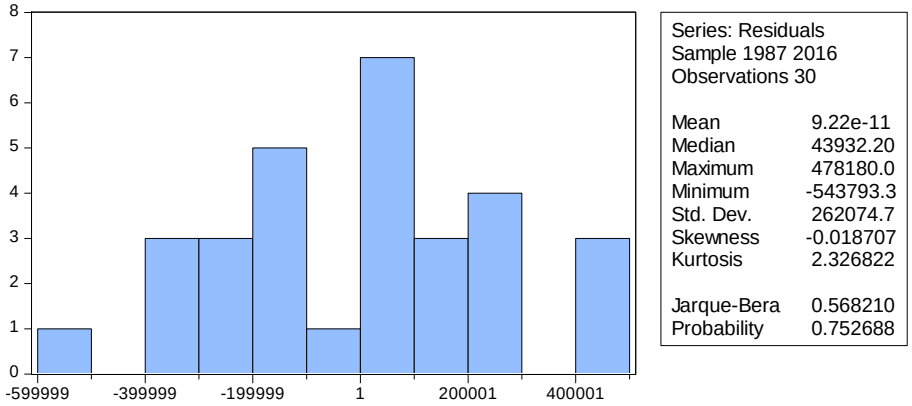

Figure 2: Jarque-Bera Normality Test Results

Source: Author's Analysis

The results of the post-analysis diagnostic tests in fig. 2 above indicate that the residuals are normally distributed with zero mean, with a JB probability value greater than 5 percent. Hence, the null hypothesis of residual normality is accepted.

IV. CONCLUDING REMARKS

The study has followed a systematic and logical process in discussing and analyzing the impact of macroeconomic aggregates on the BOP of Nigeria. Our empirical evidence revealed that all the times series utilized were non-stationary at their levels but became stationary at first difference. That is, they are all I(1) series. The cointegration results confirm that the BOP cointegrates with Exchange Rate, External Debt, Real Gross Domestic Product and Foreign Direct Investment.

From our analyses, the external sector of the Nigerian economy has been under severe pressure. This is necessitated by the fact that the value of the naira vis-à-vis other currencies has continued to fall, while total non-oil export remained negligible, thereby reducing foreign exchange earnings, increasing the debt burden and making the balance of payments to suffer severe pressure. To cushion this pressure and put the Nigerian economy on the path of sustainable growth, the government has to reduce fiscal deficits, encourage private investment in order to stimulate non-oil exports, and address the external debt problem. Finally, there is the need to consolidate this present deregulation exercise.

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