

# Modeling The Determinants Of Balance Of Payments Performance In Nigeria

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## Abstract

This study assessed the determinants of balance of payment performance in Nigeria using time-series data for period the 1975-2012. The determinants of balance of payment performance in the areas of money supply, exchange rate, real interest rate, terms of trade, openness of economy, gross capital formation and political instability were sourced from the Kenya Economic Surveys, Central Bank of Kenya (CBK) reports, Kenya statistical abstracts and World Bank (WB) and International Monetary Fund (IMF) publications data. The determinants of balance of payment performance were used as the independent variables while the Balance of Payments (BOP) for Nigeria was used as the dependent variable. The unit root test showed that the data were integrated at order one while the long run relationship among the variables were confirmed using the Johansen cointegration test. Estimates of the Error Correction Model showed that the determinants of balance of payment performance on Money Supply (MS2), Terms of Trade (TOT), Exchange Rate Fluctuation (EXCH) have positive relationship with the determinants of balance of payment performance in Nigeria with terms of trade having significant impact on balance of payment performance. The determinants of balance of payment performance on Gross Capital Formation (GCF), Real Interest Rate (RIR), Openness of the Economy (OE), Political Instability (POL) were found to be negative. The joint test of significance revealed that the determinants of balance of payment performance have joint impact on an open economy of the balance of payments in Nigeria. Based on the findings, we concluded that the balance of payment performance contributed to the improvement and enhancement of terms of trade, gross capital formation, real interest rate in the open economy in Nigeria.

**Keywords:** Balance of Payment, Error Correction Model, Cointegration, Unit root test

## 1. INTRODUCTION

The concept of balance of payment was discussed in 1960s and 1970s by Mundell (1962), Fleming (1962) and Johnson (1972). It was an improvement on the Keynesian model of income determination in an open economy. Balance of payments account is composed of four main elements namely; current account balances, capital and financial account balances, balancing items (errors and omissions) and reserves balances.

In the recent times, Nigeria has been faced with sharply declining oil revenue which provides approximately 90% of the nation's foreign exchange, with a crushing debt services burden resulting from the inability of the nation to tailor its import needs to the available foreign exchange and resultant to severe pressures on the balance of payment in the past few years (Nwanosike, 2010).

Balance of payment is needed in a country because it will give an account of import of a country and this will act as signal for some domestic policies. For example, if the amount spent on importation of consumable goods is too high, domestic policies may be needed towards restriction or setting up of import substitutions industry. On the export side, BOP tells us our export composition and the extent to which a country depends on certain commodities for our foreign exchange earnings. Moreover, it provides the basis for comparison of trade relations among countries so as to know if a country is incurring deficit or surplus. Furthermore, it provides historical data on import and export overtime and this could be used for planning purposes. It also provides statistics for the net foreign investment component of the national income (Afolabi, 1999).

Moreover, Central Bank of Nigeria (2013) noteworthy fact about the balance of payments account disequilibrium is the persistent deficit on the services account. Between 1950 and 1974, it rose from N12.0m to N1, 314.7m and from 1993 till date, the existence of a deficit in the service account is a phenomenon common to Nigeria economy.

Imoisi et al (2013) said that Nigeria's balance of payment had started to show signs of disequilibrium having been managed over the years within a policy framework of direct control. Following the sudden collapse of international oil prices in 2014 and the consequent fall in foreign exchange receipts, controls were tightened. However, the controls proved counterproductive as it became clear that the economy could not be managed within a policy framework that placed heavy reliance on direct controls.

Income balances are made up of items such as compensation of employees, interest, rent, profits, dividends and royalties received from foreign countries and paid out to foreign countries. Items that make up transfers account balances are gifts, grants and reparation receipts and payments to foreign countries. Transfers can be government transfers or private transfers. Government transfers are normally given either for economic, political or humanitarian reasons (Mannur, 2012).

Marshall, (1923) and Lerner (1944) argued that exchange rate changes restore equilibrium in balance of payment (BOP) by devaluing a country's currency. They stated that when the sum of price elasticity of demand for exports and imports in absolute terms is greater than unity, devaluation will improve the country's balance of payments (BOP). The reason according to Marshall – Lerner is that devaluation reduces the prices of exports in terms of foreign currency and at the same time cheapens exports & imports dearer, thus have corrective effect on balance of payments (BOP).

## 2. METHODOLOGY

This section describes the model specified for the problem, the variables used and their definitions. Factors identified to have impact on balance of payment (gross capital formation, money supply, terms of trade, exchange rate, openness of the economy and political instability ) were regressed on the yearly balance of payments in Nigeria. Annual Time Series Data covering the period of 1975 to 2012 were obtained from Kenya Economic Surveys, Central Bank of Kenya (CBK) Reports, Kenya statistical abstracts and World Bank (WB) and International Monetary Fund (IMF) publications data.

In order to purge the data of spurious results, Augmented Dickey Fuller (ADF) unit root test was conducted and the result necessitated the test for the long run relationship among the variables (co-integration) using the Johansen cointegration test approach, as specified in Granger and Newbold (1977). The model coefficients were estimated using the Error correction model technique.

### 2.1 Model Specification

In order to effectively analyze the relationship between BOP and its determinants, models of (Eita, 2012; Osoro, 2013) were employed. These models specified that BOP and its determinants were explored in each variable based on their lags of all the variables utilized by the model.

The model is a linear one of the form

$$BOP = (X_1), \tag{1}$$

where; BOP= Balance of Payment ,  $(X_1)$  =set of chosen explanatory variables

The chosen variables are reflected in the model as

$$BOP = f ( GCF, MS_2, TOT, EXCH, RIR, OE, POL) \tag{2}$$

where BOP = Balance of Payment GCF = Gross capital formation ,  $MS_2$  =Money Supply , TOT =Terms Of Trade ,

EXCH = Exchange Rate Fluctuation, RIR = Real Interest Rate OE = Openness of the Economy POL = Political Instability

In order to estimate equation, we specify it in econometric form as:

$$BOP_t = \beta_0 + \beta_1 GCF_t + \beta_2 MS_{2t} + \beta_3 TOT_t + \beta_4 EXCH_t + \beta_5 RIR_t + \beta_6 OE_t + \beta_7 POL_t + \varepsilon_t \tag{3}$$

where  $\beta_0$  = Intercept and  $\beta_i$  (where  $i=1,2,3,4,5,6,7$ ) are parameters to be estimated and  $\varepsilon_t$  = error term

However, a log-linear form is more likely to find evidence of a deterrent effect than a linear form, we therefore log-linearized equation as:

$$\ln BOP_t = \beta_0 + \beta_1 GCF_t + \beta_2 MS_{2t} + \beta_3 TOT_t + \beta_4 EXCH_t + \beta_5 RIR_t + \beta_6 OE_t + \beta_7 POL_t + \varepsilon_t \tag{4}$$

$$\ln = \text{natural log of their respective variables} \tag{5}$$

The Error Correction Model represents the short run model estimates and the equation is specified thus:

$$\Delta(\text{BOP})_{t-1} = \beta_0 + \beta_1 \Delta(\text{GCF})_{t-1} + \beta_2 \Delta(\text{MS2})_{t-1} + \beta_3 \Delta(\text{TOT})_{t-1} + \beta_4 \Delta(\text{EXCH})_{t-1} + \beta_5 \Delta(\text{RIR})_{t-1} + \beta_6 \Delta(\text{OE})_{t-1} + \beta_7 \Delta(\text{POL})_{t-1} + \text{ECM}(-1) \quad (6)$$

where “ $\Delta$ ” represents the first difference operation of the variables, ECM (-1) is the one period lag of the model residual and  $U_t$  is the disturbance or error term. The parameters  $\beta_1$  to  $\beta_7$  are the short run coefficients of the model while the coefficient of ECM (-1) is the long run speed of adjustment of the model. The sign of the coefficient of ECM (-1) should be negative and significant as well for holding the long run equilibrium (Dhungel, 2014).`

### 2.2 Unit Root Test

The presence of trends and unit roots are detected from the slowly decaying autocorrelation function in univariate process which indicates non-stationarity. Consider AR<sub>(p)</sub> model so that

$$Y_t = \phi_1 Y_{t-1} + \phi_2 Y_{t-2} + \dots + \phi_p Y_{t-p} + \varepsilon_t \text{ which can be written as}$$

$$\psi(L)y_t = \varepsilon_t \quad (7)$$

where  $\psi(L) = 1 - \phi_1 L - \phi_2 L^2 - \dots - \phi_p L^p$  is a polynomial in lag L.

If the root of the characteristic equation  $\psi(L) = 0$  are all greater than unity in absolute term, then  $y_t$  is stationary, otherwise  $y_t$  is non stationary.

### 2.3 Dickey-Fuller test

The Dickey-Fuller test affirms if  $\phi = 0$ . In this model of the data  $y_t = \beta_t + \phi y_{t-1} + e_t$ , which is written as  $\Delta y_t = y_t - y_{t-1} = \beta_t + \gamma y_{t-1} + e_t$ . It is written this way so we can perform a linear regression of  $\Delta y_t$  against t and  $y_{t-1}$  and test if  $\gamma$  is different from 0. If  $\gamma = 0$ , then we have a random walk process. If not and  $-1 < 1 + \gamma < 1$ , then we have a stationary process. Given the model

$$y_t = \beta y_{t-1} + \varepsilon_t \quad (8)$$

Subtracting  $y_{t-1}$  from both sides, we have

$$y_t - y_{t-1} = \beta y_{t-1} - y_{t-1} + \varepsilon_t$$

$$\Rightarrow \Delta y_t = (\theta - 1) y_{t-1} + \varepsilon_t$$

$$= \delta y_{t-1} + \varepsilon_t \quad (9)$$

Testing for  $\theta = 1$  is equal to testing for  $\delta = 0$

The following regression equations and the associated error terms are considered for unit root test:

$$\Delta y_t = \delta y_{t-1} + \varepsilon_t \quad (10)$$

$$\Delta y_t = \beta_0 + \delta y_{t-1} + \varepsilon_t \quad (11)$$

$$\Delta y_t = \beta_0 + \delta y_{t-1} + \beta_1 t + \varepsilon_t \quad (12)$$

### 2.4 Augmented Dickey-Fuller (ADF) test

The ADF test belongs to a category of tests called ‘Unit Root Test’, which is the proper method for testing the stationarity of a time series. The Augmented Dickey-Fuller test checks through these models:

$$\Delta y_t = (\rho - 1)y_{t-1} + \sum_{j=1}^n \beta_j \Delta y_{t-j} + \varepsilon_t \quad (13)$$

$$\Delta y_t = \alpha + (\rho - 1)y_{t-1} + \sum_{j=1}^n \beta_j \Delta y_{t-j} + \varepsilon_t \quad (14)$$

$$\Delta y_t = \alpha + \delta_t + (\rho - 1)y_{t-1} + \sum_{j=1}^n \beta_j \Delta y_{t-j} + \varepsilon_t \quad (15)$$

*Hypotheses Tests are specified as :*

$$H_0 : \rho = 1 \quad \text{vs} \quad H_1 : \rho < 1$$

$$H_0 : \alpha = 0 \quad \text{vs} \quad H_1 : \alpha \neq 0$$

$$H_0 : \gamma = 0 \quad \text{vs} \quad H_1 : \gamma \neq 0$$

*The test statistic is specified as :*

$$T_\rho = \frac{\hat{\rho}}{S.E.(\hat{\rho})} \quad \square \quad ADF(I, n, \alpha) \text{ is compared with the appropriate value of Dickey Fuller table}$$

The null hypothesis for the tests is that the data are non-stationary, and it is rejected for this test so that we want a p-value of less than 0.05.

## 2.5 Co-integration

Co-integration studies the long-run equilibrium in multivariate non-stationary time series. A multivariate process that is non stationary by differentiation, and the resulting series can be modelled by uni-variate techniques. Even though, it is possible to treat all processes at the same manner before carrying out further analysis, it is not so straight forward in a multivariate case. The modern approach is to have a linear combination of non stationary variables that is stationary, and such variables are said to be co-integrated (Shittu and Yahaya, 2011).

Co-integration technique analyzes the joint movement of economic variables and their departure from equilibrium overtime. It expresses the relationship that exists between two non-stationary series for which the stochastic relationships are bounded. Its emphasis is on the following:

- (a) It established a link between two non stationary series by obtaining a linear combination which gives integration of order zero  $[I(0,1)]$ .
- (b) It helps to establish relationship among non stationary series such that the relationship is reasonable, sensible and of statistical importance.
- (c) It specifies the Error Correction Model (ECM).

Co-integration test is performed in this study using Johansen methodology which offers two tests for testing the number of co-integrating relationships: the trace test and the eigen-value test. The trace test tests the null hypothesis that there are at most  $r$  co-integrating relationships. That is, rejecting the null means that there are more than  $r$  co-integrating relationships. The test itself computes the trace statistic, and compares it with critical values. Critical values have been computed by several different sources, including Johansen himself. The trace test rejects the null if the trace statistic exceeds the critical value.

The eigen-value test tests the null hypothesis of  $r$  versus  $r + 1$  co-integrating relationships. The test rejects the null hypothesis if the eigen-value test statistic exceeds the respective critical value  $T$ .

Consider two economic series  $X_t$  and  $Y_t$  such that their co-movement is described as

$$Y_t = \beta X_t = w_t \quad (16)$$

$$Y_t = \alpha X_t = \varepsilon_t \quad (17)$$

where  $w_t = w_{t-1} + \varepsilon_{1t}$

$$\varepsilon_t = \rho \varepsilon_{t-1} + \varepsilon_{1t}$$

From equation (17),

$$X_t = \frac{\varepsilon_t - Y_t}{\alpha} \quad (18)$$

Substituting (18) in (16) to have

$$\begin{aligned} Y_t &= w_t - \beta X_t \\ &= w_t - \frac{\beta(\varepsilon_t - Y_t)}{\alpha} \\ \Rightarrow \alpha Y_t &= \alpha w_t - \beta \varepsilon_t + \beta Y_t \\ \Rightarrow Y_t &= (\alpha - \beta) w_t - \beta \varepsilon_t \\ \Rightarrow Y_t &= \alpha(\alpha - \beta)^{-1} w_t - \beta(\alpha - 1)^{-1} \varepsilon_t \quad (19) \end{aligned}$$

Thus  $\{Y_t\}$  and  $\{X_t\}$  are linearly dependent on  $w_t$  and the cointegrating vector is  $(1: \alpha)$ , the long run equilibrium.

### 2.5.1 Johansen Procedure

Testing for co-integration in the multivariate case amounts to determining the rank of a series,  $\pi$ , where we effectively need to determine the number of non-zero eigenvalues in  $\pi$ . Johansen (1988) established a novel method for determining the number of eigenvalues in a maximum likelihood framework. It suggests that one should order the eigenvalues such that  $\lambda_1, \lambda_2, \dots, \lambda_n$  where  $\hat{\lambda}_1$  is the first eigenvalue. To test the null hypothesis that there are at most  $r$  co-integrating vectors that would then amount to testing,  $H_0 : \hat{\lambda}_i = 0$  for  $i = r + 1, \dots, n$ ,

where only the first  $r$  eigenvalues are non-zero. For instance, if  $n = 2$  and  $r = 1$  as in the first example, the first eigenvalue,  $\hat{\lambda}_1$  will be non-zero and the second  $\hat{\lambda}_2$  will be zero.

In the three variable case, when  $n = 3$  and  $r = 2$ , the first two eigenvalues are non-zero and the third,  $\hat{\lambda}_3$  is zero. By adding more variables, this pattern will continue until  $n = r$ . Therefore, when the series has rank zero, then there is no long-run relationship, so all the eigenvalues are equal to zero.

To calculate the estimate for the appropriate rank, we will describe two test statistics, which include the trace statistic and the maximum eigenvalue statistic. The trace statistic specifies the null of hypothesis,  $H_0$ , for  $r$  cointegration relations as,

$$\lambda_{\text{trace}} = -T \sum_{i=r+1}^n \log \left( 1 - \hat{\lambda}_i \right), r = 0, 1, 2, \dots, n-1, \quad (20)$$

where the alternative hypothesis is that there are more than  $r$  co-integration relationships. The maximum eigenvalue statistic for the null hypothesis of at most  $r$  co-integration relationships is then computed as,

$$\lambda_{\text{max}} = -T \sum_{i=r+1}^n \log \left( 1 - \hat{\lambda}_{r+1} \right), r = 0, 1, 2, \dots, n-1, \quad (21)$$

where the alternative hypothesis is that there are  $r+1$  co-integration relationships.

For both tests, the asymptotic distribution is non-standard and depends upon the deterministic components (constant and trend), just as in the case of the univariate Dickey-Fuller test for unit roots. Tabulated critical values can be found in Johansen (1988) and Osterwald-Lenum (1992). In both cases, the calculated test statistics must be greater than tables to reject null hypothesis.

## 2.6 Error Correction Model (ECM)

Where a co-integrating relationship may be used to define an equilibrium relationship, the time paths of co-integrated variables are influenced by the extent of any deviation from the long run equilibrium. If the variables are co-integrated, then they will return towards the equilibrium values, although they need not actually attain these values at a particular point in time. What is essential is that there is a force that will draw the variables towards the equilibrium values, so that the deviation from equilibrium is not permanent.

The deviation of a co-integrated variable from the path of equilibrium may be modelled with the aid of an error correction representation. Engle and Granger (1987) formalised the connection between this dynamic response to the errors and co-integration in the Engle-Granger representation theorem, which states that two variables are co-integrated if, and only if, there exists an error correction mechanism for one set of variables.

Consider  $X_1$  and  $X_2$  as share prices that are co-integrated. If it is assumed that the gap between the prices during the current period of time is relatively large, when compared to the long-run equilibrium values. In this case, the low

priced share  $X_2$  must rise relative to the high priced share  $X_1$ . This can be accomplished by either an increase in  $X_2$  or a decrease in  $X_1$ , an increase in  $X_1$  with a larger decrease in  $X_2$ , or a decrease in  $X_1$  with a smaller decrease in  $X_2$ .

The regression that describes the relative movements in the two in the two prices could then take the form:

$$P_{1,t} = \beta_1 P_{2,t} + \mu_t \quad (22)$$

If the errors,  $\mu_t$ , are stationary then they may be described by the autoregression:

$$\mu_t = \phi \mu_{t-1} + \varepsilon_t \quad \text{with } |\phi| < 1 \quad (23)$$

Hence after writing equation (22) as  $\mu_t = P_{1,t} - \beta_1 P_{2,t}$ , and substituting it in equation (23), we have

$$\begin{aligned} P_{1,t} - \beta_1 P_{2,t} &= \phi_1 (P_{1,t-1} - \beta_1 P_{2,t-1}) + \varepsilon_t & (24) \\ P_{1,t} &= \beta_1 P_{2,t} + \phi_1 (P_{1,t-1} - \beta_1 P_{2,t-1}) + \varepsilon_t \end{aligned}$$

Adding and subtracting  $P_{1,t-1}$  and  $P_{2,t-1}$  on both sides, we have

$$\begin{aligned} \Delta P_{1,t} &= -(1 - \phi_1)(P_{1,t-1} - \beta_1 P_{2,t-1}) + (\beta_1 \Delta P_{2,t-1}) + \varepsilon_{1,t} & (25) \\ &= \alpha (P_{1,t-1} - \beta_1 P_{2,t-1}) + \varepsilon_{1,t} \end{aligned}$$

where  $\alpha = -(1 - \phi_1)$ , while  $\beta_1 \Delta P_{2,t}$  is stationary and  $\varepsilon_{1,t} = (\beta_1 \Delta P_{2,t} + \varepsilon_{1,t})$ .

Thus large persistence in the autoregressive error would imply a slow speed of adjustment. This is error correction mechanism (ECM), which describes the manner in which the variables return to equilibriums. Assuming the two share prices are CI (1,1), then their respective error mechanism is written as

$$\begin{aligned} \Delta P_1 &= \alpha_1 (P_{2,t-1} - \beta_1 P_{1,t-1}) + \varepsilon_{1,t} & (26) \\ \Delta P_2 &= \alpha_2 (P_{2,t-1} - \beta_1 P_{1,t-1}) + \varepsilon_{2,t} \end{aligned}$$

### 3.0. RESULTS

**Table 3.1: Results of ADF Unit root test of Stationarity**

Variables	Maxlag (SIC)	ADF test statistic @ Levels	ADF test statistic @ First Difference	Critical Value @ 1%, 5%, or 10%	Remark
LNBOB	9	0.431915	-10.92542	-3.632900	Stationary@ Order 1
LNGCF	9	-3.275113	-9.131953	-3.626784	Stationary@ Order 1
LNMS2	9	-0.209635	-6.652903	-3.626784	Stationary@ Order 1
LNTOT	9	-3.492581	-7.066385	-3.626784	Stationary@ Order 1
LNEXCH	9	-0.394984	-5.469337	-3.626784	Stationary@ Order 1
LNRIR	9	-3.673223	-8.266280	-3.632900	Stationary@ Order 1
LNOE	9	-2.310574	-6.623463	-3.626784	Stationary@ Order 1
LNPOL	9	-5.726961	-1.612072	-2.976263	Stationary@ Order 1

The unit root tests at significance level and at first difference are summarized in table 3.1 above. It can be seen that BOP, Gross Capital Formation (GCF), Money Supply (MS2), Terms of Trade (TOT), Exchange Rate Fluctuation



(EXCH), Real Interest Rate (RIR), Openness of the Economy (OE) and Political Instability (POL) are all stationary at first difference and are therefore integrated of order I(1). Since none of the variables are integrated of order I(0), and since the order of integration of the variables are not of mixed order [i.e. not I(1) and I(0)], we test for the existence of long run relationship amongst the variables using the Johansen co-integration test.

**Table 3.2: Results of Johansen Co-integration Test**

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE (s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.928979	258.0935	159.5297	0.0000
At most 1 *	0.748896	162.8814	125.6154	0.0000
At most 2 *	0.645970	113.1334	95.75366	0.0019
At most 3 *	0.576822	75.75190	69.81889	0.0155
At most 4	0.479569	44.79325	47.85613	0.0943
At most 5	0.328368	21.28172	29.79707	0.3403
At most 6	0.162979	6.952111	15.49471	0.5832
At most 7	0.015093	0.547495	3.841466	0.4593

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon – Haug – Michelis (1999) p - values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE (s)	Eigenvalue	Max – Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.928979	95.21208	52.36261	0.0000
At most 1 *	0.748896	49.74803	46.23142	0.0202
At most 2 *	0.645970	37.38149	40.07757	0.0976
At most 3 *	0.576822	30.95865	33.87687	0.0155
At most 4	0.479569	23.51154	27.58434	0.1527
At most 5	0.328368	14.32960	21.13162	0.3386
At most 6	0.162979	6.404616	14.26460	0.5619
At most 7	0.015093	0.547495	3.841466	0.4593

Max – eigenvalue test indicates 2 cointegrating eqn (s) at the 0.05 level

\*denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon – Haug – Michelis (1999) p – values

Table 3.2 above shows the co-integration test result. The Trace statistic and the Max – Eigen statistic both indicate different 4, 2 co-integrating equations at 5% level. The existence of 4, 2 co-integrating equations confirm that there is a long run relationship amongst the variables. Therefore, this leads to the estimation of the model parameters using the Error Correction Model (ECM).

**Table 3.3: Error Correction Model Result**

<b>Error Correction Model</b>				
<b>Included observations : 36 after adjustments</b>				
<b>Variable</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t - Statistic</b>	<b>Prob.</b>
C	-0.561342	0.25370	-2.21260	0.001101

D(GCF)	-0.403459	0.19619	-2.05650	0.004046
D(MS2)	0.021891	0.18198	0.12029	0.083001
D(TOT)	0.038136	0.17040	0.22380	0.007272
D(EXCH)	0.090327	0.20843	0.43337	0.296808
D(RIR)	-0.198409	0.17762	-1.11707	0.001318
D(OE)	-0.325241	0.32482	-1.00129	0.751143
D(POL)	-0.175710	0.23255	-0.75558	0.485321
ECM (-1)	-0.282196	0.21814	-1.29363	0.000000
R-squared	0.559609	Mean dependent var		3439.750
Adjusted R-squared	0.407166	S.D. dependent var		34336.12
F-statistic	3.670941	Akaike info criterion		23.43308
Log likelihood	-411.7954	Schwarz criterion		23.87294

#### 4.0 DISCUSSION OF RESULTS

A cursory examination of the Error Correction Model estimates above shows that the short run coefficients of Money Supply (MS2), Terms of Trade (TOT), Exchange Rate Fluctuation (EXCH) are positive while Gross Capital Formation (GCF), Real Interest Rate (RIR), Openness of the Economy (OE), Political Instability (POL) are negative.

The determinants of balance of payments performance in Money Supply (MS2) means that for every unit increase in balance of payments on money supply in Nigeria increases by 0.021891 units annually. This implies a direct relationship between determinants of balance of payments performance and money supply in Nigeria for the period reviewed. However, this direct relationship was not found to be significant.

The positive and significant coefficient of the determinants of balance of payments performance in Terms of Trade (TOT) means that for every unit increase in determinants of balance of payments performance on terms of trade in Nigeria increases significantly by 0.038136 units annually. This shows that determinants of balance of payments performance in terms of trade helped significantly to grow the balance of payments in Nigeria.

Again, the coefficient of Exchange Rate Fluctuation shows that a unit increase in determinants of balance of payments performance in Exchange Rate Fluctuation (EXCH) increases the balance of payments by 0.090327 units. This shows a direct relationship between determinants of balance of payments performance and Exchange Rate Fluctuation in Nigeria. Moreover, this direct relationship was not found to be significant in growing the balance of payments in Nigeria.

More so, the determinants of balance of payments performance in Gross Capital Formation (GCF) show a negative relationship with balance of payments performance in Nigeria decreasing it by 0.403459 units. Based on the result obtained, it means that the determination in an open economy has not done enough balance of payments in Nigeria.

Moreover, the determinants of balance of payments performance in Real Interest Rate (RIR) show a negative relationship with balance of payments performance in Nigeria, decreasing it by 0.198409 units. This shows that determination in an open economy has not helped significantly to grow the balance of payments in Nigeria.

Furthermore, the determinants of balance of payments performance in Openness of the Economy (OE) show a negative relationship with balance of payments performance in Nigeria decreasing it by 0.325241 units. Based on the result obtained, it means that the determination in an open economy has established enough balance of payments in Nigeria. However, the determinants of balance of payments performance in Political Instability (POL) show a negative relationship with balance of payments performance in Nigeria, decreasing it by 0.175710 units. Based on the result obtained, it means that the determination in an open economy has not done enough balance of payments in Nigeria.

The joint test of hypothesis revealed that the determinants of balance of payments performance have joint significant effect on an open economy of the balance of payments in Nigeria.

The result shows that the ECM (-1) is negative and significant. The Error Correction coefficient of 0.282196 is the speed of adjustment of the model from the short run equilibrium to long run equilibrium. This implies that 28% of the error is corrected in each time period. The speed of adjustment implies that it will take about two years to correct all errors / deviations and bring the economy of Nigeria back to equilibrium.

The adjusted coefficient of determination of 0.5596 implies that about 56% of the economy in Nigeria is accounted for by determinants of balance of payments performance in Nigeria. This represents a fairly good fit.

#### **4.0 CONCLUSION AND RECOMMENDATION**

Our study is to identify the factors that affect the balance of payment performance in Nigeria. The study has led to the formulation of a model using secondary data obtained from the Kenya Economic Surveys, Central Bank of Kenya (CBK) Reports, Kenya statistical abstracts and World Bank (WB) and International Monetary Fund (IMF) publications data. Based on the analysis, we conclude that the balance of payment performance contributed to the improvement and enhancement of terms of trade, gross capital formation, real interest rate in the open economy in Nigeria. Even though money supply, terms of trade and exchange rate fluctuation have contributed positively to the development of balance of payment, it has not significantly affected the generality of the people in terms of economic growth and development based on balance of payment in Nigeria.

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