Nigeria's Current Account Determination under Changes in Government Fiscal Policy and Exchange Rate Volatility (1970-2015)

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Author's contribution

The sole author designed, managed literature searches, analyzed, interpreted result, prepared and proof read the manuscript.

Original Research Article

ABSTRACT

In the face of current account imbalances, exchange rate volatility, fluctuation in lending rate and inflation, development and growth of the economy could be hampered. These calls for better informed and evaluated macroeconomic policies to take care of economic and financial challenges. With this scenario in mind, the long run linkage between current account, fiscal policy and exchange rate volatility was evaluated for a period of forty five years from 1970 to 2015. Secondly, whether fiscal policy and exchange rate volatility determines Nigeria's current account position was also ascertained. The data were diagnosed for heteroskedasticity, serial correlation, Ramsey Reset and multicollinearity. Johansen co-integration was used in evaluating the long run linkage, short run and long run dynamics by VAR error correction model and determinants of current account by granger impact assessment analysis. The result of the Johansen co-integration revealed that current account, fiscal policy and exchange rate volatility amidst fluctuation in prime lending rate and inflation are connected in the long run. The negative normalised coefficient depicted that rising fiscal deficit and exchange rate volatility will in the long run tremendously affect the current account

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position of Nigeria. The granger impact assessment analysis disclosed that fiscal policy and exchange rate are not determinant of Nigeria's current account. The study put forward that Federal Government of Nigeria should stop further budget deficit and ensure stability in the exchange rate. In addition, Central Bank of Nigeria should reduce the minimum rediscount rate which determines the prime lending rate.

1. INTRODUCTION

Nigeria like other developing countries, has over the years engaged in international trade in order to earn foreign exchange for the development and growth of economy. Notwithstanding the huge revenue from crude oil export, the level of development attained is not commensurate with her earnings from crude oil sales. In addition, her current account has virtually remained on the deficit side. Consequently, an assessment of the balance of payment by specifically looking at the current account section is indisputable. This is attributed to the fact that the values of a country's export and imports are contained in the current account. The adoption of Keynesian economic postulations was premised on the need to sustain the pace of economic growth and development within the environment of shallow and weak entrepreneurial class [1]. A temporary increase in government spending will increase both the fiscal deficit and the current account deficit, a case of twin deficits while an undying increase in government spending will have no effects on the current account while its effects on the fiscal balance will depend on the mode of financing the extra spending [2]. [3] observed that reduction of fiscal deficits will reduce current account balance deficits stemming from the idea that internal fiscal balance may most likely, produce external imbalance. The fiscal policy decision of the government with deep respect to fiscal deficit over the years has been rising continuously thus, affecting the current account position of Nigeria.

A pertinent issue raised in most scholarly works on the subject matter of this study tends anchor on the significant effect of exchange rate and government fiscal policies in improving current account. Over the years, Nigerian government has formulated and implemented various economic policies geared towards enhancing the current account position. For instance, National Economic Empowerment Development Strategy became operational in 2003 for promulgation of economic policies that would drive economic growth and development and with much emphasis on improving Nigeria earnings from international trade. In the face of current account imbalances, exchange rate volatility, depleting external reserve and the two component of government expenditure that should influence economic growth has turned out to affect the gross domestic product, unemployment, inflation and aggregate demand negatively [4]. This calls for better informed and evaluated macroeconomic policies to take care of the aforementioned economic and financial challenges. No country irrespective of its global importance, appears immune to crisis and as such, there should be serious re-visitation to the rules and regulation governing the mechanics of the economy points an impeccable policy intervention. Danger signals emanating from early historical facts should not be relied upon as old rule of valuation no longer apply and that stems from "Lucas Critique". The Lucas Critique, named from Robert Lucas, known for his work on macroeconomic policy making argued that it is naïve to try to predict the effects of a change in economic policy entirely on the basis of the relationships observed in historically data, especially aggregated historically [5].

The need to examine the dynamics of current account balances in a developing country such as Nigeria should be a continuous and consistent exercise because, of the role current account position plays in maintaining external balance of Nigeria [6]. According to [7], assessing the link between exchange-rate misalignments and current-account imbalances is of crucial importance for two main reasons. First, if current-account imbalances receive a lot of attention in the perspective of global imbalances reduction, current-account surpluses or deficits become truly problematic only when the current account diverges from its fundamental level. Second, there is no consensus in the literature regarding whether current-account imbalances mainly result from currency misalignments. [8] noted that the emergence of large global current account imbalances over the past decade has triggered a controversial academic as well as policy debate about their causes and likely

adjustment. It is against these backdrops and among various school of thoughts on sustainable growth and development argue that favourable and stable current account, exchange rate and government expenditure are ideal given early and timely policy response. These they address on microeconomic level. Furthermore, popular studies on determinants of current account imbalances and exchange rate movements have centred on compartmentalized approach which is erroneous as the benchmark of proposals for exchange rate management should align with the benchmark policy actions on current account to ensure improvement on the balance of payment for an ultimate external sector balance. The first object of this study therefore, is to examine the long run linkage between current account, fiscal policy and exchange rate volatility. Secondly, to ascertain whether fiscal policy and exchange rate volatility determines Nigeria's current account position. Subsequently, the null hypotheses are stated as:

1. Fiscal policy expressed via fiscal deficit does not determines the Nigeria's current account position.
2. Volatility in exchange rate does not determine Nigeria's current account position.

Following the background of the subject matter in section one, the remainder of this study is structured as follows. Section two dealt with concise conceptual clarification, theoretical background and empirical studies. Section three presents the methodology and data while section four features the data analysis and empirical results. Section five concludes the study with some recommendations.

2. REVIEW OF RELATED LITERATURE

2.1 Conceptual Clarification

Current account imbalance has always been a great concern as it triggers up disturbances in the areas of tax on capital movement, and government expectation effect on dollar depreciation. Current account is an integral component of balance of payment and part of macroeconomic models used for the health status of a nation. It records the values of exports and imports that is; the flows of trade in goods and services. Typically, it is expected to balance based on the trade balance theory. The question on its implications rests on the causative effect on exchange rate. The current account

imbalance arising from partial equilibrium prices income inelasticity of demand for exports and imports calls for exchange rate management. In Nigeria, the current account had a mix account as transfers account recorded surplus in 2012 as a result of remittances from Nigerians abroad which increased by 0.90% from 3,435.1 billion to 3,467.0 billion in 2013. Deficit recorded in the service account narrowed by 7.5% from 3,392.7 billion in 2012 to 3,137.6 billion in 2013. The goods account was volatile too as analysis revealed that crude oil and gas exports earnings decreased by 0.9% in 2013 [9].

Several attempts by government of Nigeria to improve well-being of her citizens and enhanced economic development have resulted in increased government spending, substantial part of such spending are financed from borrowing leading to rising fiscal deficit. Government spending has broader objective to achieve macroeconomic stability via maintenance of domestic stability (stable inflation, reduced unemployment rate, balanced budget) and external stability (current account, capital account, external debt sustainability and external reserve build up). Increase in government spending would give rise to inflationary tendencies and current account imbalances if the accompany policy intervention for the relevant sector are not prescribed. This accounted for the reason that [10] argued that as a general rule, expenditure changing policies have the most direct and qualitative strong influence on the current account. In contrast, expenditure switching policies affects the exchange rate significantly but, have only a limited impact on the current account adding that fiscal policy has a comparative advantage over monetary policy as an instrument for current account adjustment as opposed to domestic aggregate demand stabilization policy.

Exchange rate as the price with which a country's currency is exchanged with another is expected to be stabilized for market based monetary management. Countries are expected to maintain an exchange rate variability of not more than 10.0% and not less than 5.0% with expectation that any country with floating exchange rate above this bench mark should take appropriate policy actions to prevent the volatility of their exchange rate by keeping them within the prescribed fluctuation margin and manage their exchange rate very well to avoid overvaluation and depreciation [11].

2.2 Theoretical Background

Current account among countries have been long been the focus of neo-colonial and modern growth theories. The growth theory is of the view that international trade among countries is an engine of growth and has tremendous benefit to all countries engaged in it. These benefits include increased production, acquisition of new ideas and technology, poverty reduction and employment generation among others. These benefits have not been prevalent in Nigeria due to inability of locally produced to compete favourably with their foreign counterparts, concentration on non-technology driven products and non-diversification of the economy from oil dependent has contributed to low level of global trade [9].

Countries in bilateral and multilateral trade to a large extent place significant restriction on goods that are imported from countries with significant trade surpluses as remedies but all of these have limited effect on the current account balance of either countries. In response to the current account imbalances in Nigeria, the fiscal policy thrust of the Federal Government of Nigeria in 2013 focused on fiscal consolidation with inclusive growth in order to strengthen the nation's financing and enhanced job creation. The consolidated expenditure of the government was also enhanced to offset overall deficit. All of these rested on the foundation of macroeconomic stability, structural reforms and institutions and investment in priority sectors of the economy [11].

In continuation of addressing the current account imbalances, the budget of 2013 was structured to achieve among other objectives; to minimize the impact of external shocks on the economy particularly with respect to the price of crude oil which is Nigeria's main revenue earner, diversifying the oil base and reducing government borrowing [9]. These policies have been earlier applied by USA, Japan and Germany in the past in addition to tax policy on capital movement fiscal policy, government expenditure and monetary policy on current account [12,13]. The scenario in Nigeria affected the Naira to US dollar, up till now no explanation has been given as to how much must the US dollar come down in order for the current account deficit to disappear. This question cannot be answered unless the reason for Naira depreciation is specified.

2.3 Empirical Studies

Udah [1] investigated the macroeconomic policy, non-policy and financial sector variables that influence current account movements. To do this, the paper used three methodologies: the Granger Causality test, co-integration test and the variance decomposition and impulse response function. The results showed that causality is bidirectional between current account balance and budget deficit, this support the 'twin deficit hypothesis'. The Granger Causality test also revealed the existence of a unidirectional causality of current account balance with exchange rate. The causality runs from exchange rate to current account balance. The paper also found a unidirectional causality that runs from current account to trade openness. The study found that exchange rate, monetary policy credibility and budget deficit are the important macroeconomic variables that influence current account movement.

[8] analysed the role of asset prices in comparison to other factors, in particular exchange rates, as a driver of the US trade balance. It employs a Bayesian structural VAR model that requires imposing only a minimum of economically meaningful sign restrictions. The result revealed that equity market shocks and housing price shocks have been major determinants of the US current account in the past, accounting for up to 30% of the movements of the US trade balance at a horizon of 20 quarters. By contrast, shocks to the real exchange rate have been less relevant, explaining about 9% and exerting a more temporary effect on the US trade balance. The findings suggested that large exchange rate movements may not necessarily be a key element of an adjustment of today's large current account imbalances, and that in particular relative global asset price changes could be a potent source of adjustment.

Chandar and Rohan [14] explored the dynamics of Jamaica's current account and the real effective exchange rate. Short-run and long run responses were investigated. The results broadly suggest that the real exchange rate does not play a significant role in determining the major elements of the Jamaican current account. The overriding policy issue that arises from these observations is the usefulness of the real exchange rate as a tool for correcting Jamaica's external imbalance, as well as a metric that signals losses or gains in competitiveness.

Ibrahim [6] assessed the determinants of current account balance in Nigeria between the period of 1960 and 2013. Using structural vector autoregressive scheme, the study observed that there were eight important determinants of current account balance in the country within the period of study; the demographic factor, real effective exchange rate, level of financial deepening, net foreign asset/ liabilities, country's process of democracy, liquid liabilities and the square of relative income.

Gnimassoun and Mignon [7] studied current-account imbalances by paying a particular attention to exchange-rate misalignments. They relied on a nonlinear model linking the persistence of current account imbalances to the deviation of the exchange rate to its equilibrium value. Estimating a panel smooth transition regression model on a sample of 22 industrialized countries, result showed that persistence of current-account imbalances strongly depends on currency misalignments. More specifically, while there is no persistence in cases of currency undervaluation or weak overvaluation, persistence tends to augment for overvaluations higher than 11%. In addition, whereas disequilibria are persistent even for very low overvaluations in the euro area, persistence is observed only for overvaluations higher than 14% for non-Eurozone members.

Umeora and Ibenta [3] examined the effect government fiscal deficits have on Current Account Balance which has balance of payments as its proxy. In macroeconomic systems, variables are known to be interlinked so that some have countervailing effects on others. For this reason, interest rate and exchange rate were incorporated into the study. Secondary data were collected from CBN Statistical Bulletin. Hypotheses are tested using Ordinary Least Squares (OLS) method. The results of the study showed that government fiscal deficits do not affect current account balance indicating a possible absence of the existence of twin-deficits hypothesis in Nigeria. It also reported that exchange rate has significant positive effect on current account balance while interest rate has negative significant effect on current account balance.

Oseni and Onakoya [2] determined the effects of fiscal policy shocks on the current account as well as the dynamic interactions among fiscal policy shocks and current account with the other macroeconomic variables: real output, real

interest rate and exchange rate for Nigeria over the periods 1980:1-2010:4. The results of the study indicated that the expansionary fiscal policy shock has a positive effect on output, exchange rate and negative impacts on current account balance and interest rate.

Eguren-Martin [15] using a panel of 180 countries over the 1960–2007 period analysed whether exchange rate regimes affect the flexibility of the current account as originally proposed by Friedman (1953). The research found a robust evidence that flexible exchange rate arrangements do deliver a faster current account adjustment among non-industrial countries. Additionally, evidence suggests that exports respond to expenditure-switching behaviour by consumers when faced with changes in international relative prices. There was mixed evidence of credit acting as an additional avenue of influence.

Herrmann [16] examined the relationship between the exchange rate regime and the pace of current account adjustment. The panel data set includes 11 catching-up countries from central, eastern and south-eastern Europe between 1994 and 2007. The exchange rate regime is measured by a continuous z-score measure of exchange rate volatility. Based on a basic autoregression estimation, the results indicate that a more flexible exchange rate regime significantly enhances the rate of current account adjustment.

Uneze and Ekor [17] evaluated the determinants of current accounts balance in Nigeria with emphasis on oil-related variables, using the Johansen-Julius VAR co-integration estimation, the impulse response function and the variance decomposition analysis. The results showed that oil price, oil balance and oil revenue are positively related with the current account, with only oil wealth having a significant negative impact in the long-run. The findings also revealed that the impact of oil price on the current balance is only significant in the short-run. The variance decomposition analysis indicated that the variance in the current account is better explained by own shocks followed by shocks to oil price, oil balance and fiscal balance.

Wanjau [18] investigated the effect of real exchange on current account balance and additionally investigate whether the rate of import growth in Kenya is consistent to balanced economic growth as stipulated in Thirlwall law.

The data were subjected to Stationarity test using Augmented Dickey Fuller (ADF) test and Phillip Perron test. Co-integration and Error correction model was applied to analyse short run and long run dynamic. The model was subjected to heteroskedasticity test and serial correlation test and an appropriate model used in the estimation. The results showed that Marshal-Lerner-Conditions hold in Kenya and the J-curve phenomena is supported by data. Secondly import growth rate is significantly higher than the level consistent with long run growth of the economy.

3. METHODLOGY

This study employed the Johansen co-integration approach in assessing the long run linkage between current account, fiscal policy and exchange rate volatility. In determining the determinants of current account in Nigeria, test of causality was applied using a time series data from 1970 to 2015. This closes the gap in previous studies as it used up-to-data on the variables concerned. The Data were sourced from Central Bank of Nigeria statistical bulletin of 2005 and 2015. The data were diagnosed of serial correlation, multicollinearity, heteroskedasticity and rightful specification. The dependent variable is Current Account (CA) position of Nigeria within the period of the study. The independent variables are Exchange Rate Volatility (ERV) and Fiscal Deficit (FD) which is a measurement of government fiscal policy. The exchange rate volatility in the context of this study is the official exchange rate of Nigerian Naira (₦) against the United States of America Dollar ($). Prime Lending Rate (PLR) and Inflation Rate (IFR), Gross Domestic Product Growth (GDP) and Money Supply (MS) were added as control variables capable of affecting economic activities in the country which in turn influence current account position. It is suggested to introduce control variables in a model to cater for other factors that might influence the dependent variable. Political Instability (POL) is a dummy variable introduced to take care of military coups that took place within the time frame of this study.

3.1 Model Specification

The model of [17] where current account balance was expressed as a function of oil price, oil wealth, oil balance and oil revenue was adopted. Nevertheless, the model was vehemently modified to incorporate the variables that reflect the subject matter of this study. Accordingly, the model of this study is expressed in its functional form as:

$$CA = f(FD, ERV, PLR, IFR, GDP, MS, POL) \quad (3.1)$$

Econometrically logging variables in the model, we have:

$$LogCA_t = a_0 + a_1 LogFD_t + a_2 LogERV_t + a_3 LogPLR_t \\ + a_4 LogIFR_t + a_5 LogGDP_t \\ + a_6 LogMS_t + a_7 LogPOL_t + \varepsilon_t \quad (3.2)$$

Where: CA_t, FD_t, ERV_t, PLR_t, IFR_t, GDP_t, MS_t and POL_t are current account position, fiscal deficit, exchange rate volatility, prime lending rate, inflation rate, gross domestic product growth, money supply and political instability respectively in year t; α_0 is the coefficient constant; $\alpha_1 - \alpha_7$ are the coefficients of independent variables: CA_t, FD_t, ERV_t, PLR_t, IFR_t GDP_t, MS_t and POL_t in year t; and ε_t is the error term in year t.

4. DATA ANALYSIS AND EMPIRICAL RESULTS

4.1 Descriptive Statistics

Table 4.1 discusses the descriptive statistics summary of the variables in the model. Thus, the mean, median, minimum, maximum, standard deviation and number of observation among others. The series shows the mean of 517173.0, -16067.57, 55.11670, 59.60370, 18.27848, 21819.35, 2797.068 and 0.130435 for current account, fiscal deficit, exchange rate volatility, prime lending rate, inflation rate, gross domestic product growth, money supply and political instability respectively. The median are 352.0000 for current account, -1034.600 for fiscal deficit, 19.59225 for exchange rate volatility, 16.74500 for prime lending rate, 12.50000 for inflation rate, 19774.09 for gross domestic product growth, 138.2250 for money supply and 0.000000 for political instability. The maximum and minimum values are 4891700 and -3033500 for current account, 32049.40 and -285104.7 for fiscal deficit, 217.7900 and 0.546400 for exchange rate volatility, 2071.000 and 6.000000 for prime lending rate, 72.80000 and 3.200000 for inflation rate, 69023.93 and 4.220000 for gross domestic product growth, 18901.30 and 0.980000 for money supply and 1.000000 and 0.0000 for political instability respectively. On the other hand, the standard deviation are 1452387,

Table 4.1. Summary of descriptive statistics

	CA	FD	ERV	PLR	IFR	GDP	MS	POL
Mean	517173.0	-16067.57	55.11670	59.60370	18.27848	21819.35	2797.068	0.130435
Median	352.0000	-1034.600	19.59225	16.74500	12.50000	19774.09	138.2250	0.000000
Maximum	4891700.	32049.40	217.7900	2071.000	72.80000	69023.93	18901.30	1.000000
Minimum	-3033500.	-285104.7	0.546400	6.000000	3.200000	4.220000	0.980000	0.000000
Std. Dev.	1452387.	49152.10	66.48365	303.2182	15.61736	21219.27	5201.132	0.340503
Skewness	1.397856	-4.125846	0.734573	6.554815	1.812332	0.703356	1.908499	2.194691
Kurtosis	5.415530	21.46545	1.957533	43.98532	5.688014	2.461572	5.323979	5.816667
Jarque-Bera	26.16403	784.0379	6.219824	3549.012	39.03026	4.348430	38.27652	52.13387
Probability	0.000002	0.000000	0.044605	0.000000	0.000000	0.113697	0.000000	0.000000
Sum	23789957	-739108.4	2535.368	2741.770	840.8100	1003690.	128665.1	6.000000
Sum Sq. Dev.	9.49E+13	1.09E+11	198903.4	4137357.	10975.59	2.03E+10	1.22E+09	5.217391
Observations	46	46	46	46	46	46	46	46

Source: Computer output data using E-views 8.0

49152.10, 66.48365, 303.2182, 15.61736, 21219.27, 5201.132 and 0.340503 for current account, fiscal deficit, exchange rate volatility, prime lending rate, inflation rate, gross domestic product growth, money supply and political instability respectively. All the variables concerned are positively skewed toward normality except for fiscal deficit. The p-value of the Jarque-Bera is statistically significant at 5% level of significance suggesting that all the variables in the model are normally distributed according to basic econometric assumption except for, gross domestic product growth.

4.2 Diagnostic Test

4.2.1 Serial correlation LM test

In compliance with basic econometric assumption that variables in a model should be free from autocorrelation, the serial correlation LM test was conducted. The p-value of the Breusch-Godfrey serial correlation test in Table 4.2a is significant at 5% significance level implying that the variables in the models are not serially correlated.

Table 4.2a. Serial correlation LM test result

F-statistic	3.716497	Prob. F(2,39)	0.0101
Obs*R-squared	17.18341	Prob. Chi-Square(2)	0.0042

Source: Computer output data using E-views 8.0

4.2.2 Heteroskedasticity test

Another important of assumption of classical linear regression is that the variance of the residuals should not increase with fitted values of response or dependent variable, that is, variables in a stated model should free heteroskedasticity related problem in order not to affect the

outcome of the regression result. The p-value of the model in Table 4.2b is significant at 5% level of significance indicating that the model is not encumbered by heteroskedasticity problem.

Table 4.2b. Breusch-Pagan-Godfrey Heteroskedasticity test result

F-statistic	12.89824	Prob. F(4,41)	0.0000
Obs*R-squared	34.03226	Prob. Chi-Square(4)	0.0001
Scaled explained SS	36.95593	Prob. Chi-Square(4)	0.0000

Source: Computer output data using E-views 8.0

4.2.3 Ramsey RESET specification

In the quest to ensure that model is well specified econometrically, the Ramsey Reset test was performed and the result revealed that the model was well specified as confirmed by the p-value of F-statistic at 5% significance level in Table 4.2c.

Table 4.2c. Ramsey RESET specification result

	Value	df	Prob.
t-statistic	2.037287	40	0.0497
F-statistic	4.150540	(1, 40)	0.0497
Likelihood ratio	5.212713	1	0.0224

Source: Computer output data using E-views 8.0

4.2.4 Multicollinearity test

In an attempt to ensure that the introduction of the control variables in addition to fiscal deficit and exchange rate does not result to multicollinearity in the model, the correlation matrix was analysed. The correlation between gross domestic product growth and money supply is 0.88 and that is the highest correlation

between the control variables and dummy variable included in the model, hence multicollinearity does not exist by the introduction of political instability as a dummy in addition to other control variables.

4.3 Unit Root Test

In this study effort to ensure that the variables are not hindered by stationarity defect connected with most annual data, the unit root test via Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) Test were performed. The result as presented in Table 4.3a and 4.3b revealed that the variables have unit root.

4.4 Short Run Linkage

To test the short run linkage between current account, fiscal deficit and exchange rate volatility, ordinary least square estimation was carried out and outcome presented in Table 4.4. The outcome shows that fiscal deficit, gross domestic product growth, political instability and exchange rate volatility have positive relationship with current account while inflation rate, prime lending rate and money supply have negative relationship with current account however, the relationship between money supply and current account is statistically significant at 5% level of significance. The coefficient of the constant

Table 4.2d. Correlation matrix

	CA	FD	ERV	IFR	PLR	GDP	MS	POL
CA	1.00	0.15	0.42	-0.20	-0.07	0.42	0.29	-0.14
FD	0.15	1.00	0.04	-0.09	0.04	0.02	0.15	-0.01
ERV	0.42	0.04	1.00	-0.30	0.18	0.92	0.82	-0.29
IFR	-0.20	-0.09	-0.30	1.00	-0.04	-0.17	-0.26	0.16
PLR	-0.07	0.04	0.18	-0.04	1.00	0.08	-0.02	-0.06
GDP	0.42	0.02	0.92	-0.17	0.08	1.00	0.88	-0.28
MS	0.29	0.15	0.82	-0.26	-0.02	0.88	1.00	-0.21
POL	-0.14	-0.01	-0.29	0.16	-0.06	-0.28	-0.21	1.00

Source: Computer output data using E-views 8.0

Table 4.3a. ADF test result

Variables	ADF test statistic	Test critical value at 1%	Test critical value at 5%	Order of integration /remark
CA	-4.603145 (0.00)*	-3.588509	-2.929734	1(1)/Stationary
FD	-4.397600 (0.00)*	-3.584743	-2.928142	1(0)/Stationary
ERV	-5.120609 (0.00)*	-3.588509	-2.929734	1(1)/Stationary
PLR	-6.659908 (0.00)*	-3.584743	-2.928142	1(0)/Stationary
IFR	-3.326695 (0.02)**	-3.584743	-2.928142	1(0)/Stationary
GDP	-5.692255 (0.00)*	-3.588509	-2.929734	1(1)/Stationary
MS	-4.583583 (0.00)*	-3.632900	-2.948404	1(1)/Stationary
POL	-6.309898 (0.00)*	-3.584743	-2.928142	1(0)/Stationary

Source: Computer Output using E-view 8.0.
Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively.

Table 4.3b. PP test result

Variables	PP test statistic	Test critical value at 1%	Test critical value at 5%	Order of integration /remark
CA	-4.298476 (0.00)*	-3.588509	-2.929734	1(1)/Stationary
FD	-4.271570 (0.00)*	-3.584743	-2.928142	1(0)/Stationary
ERV	-5.120609 (0.00)*	-3.588509	-2.929734	1(1)/Stationary
PLR	-6.659885 (0.00)*	-3.584743	-2.928142	1(0)/Stationary
IFR	-3.302097 (0.02)**	-3.584743	-2.928142	1(0)/Stationary
GDP	-5.748918 (0.00)*	-3.588509	-2.929734	1(1)/Stationary
MS	-12.53924 (0.00)*	-2.619851	-1.948686	1(2)/Stationary
POL	-5.594377 (0.00)*	-2.617364	-1.948313	1(0)/Stationary

Source: Computer Output using E-view 8.0.
Note: In determining the truncation lag for PP test, the spectral estimation method selected is Bartlett kernel and Newey-West method for Bandwidth, p-values are in parentheses where (*) and (**) denote significance at 1% and 5% respectively

suggest that holding fiscal deficit, exchange rate, prime lending rate, gross domestic product growth, money supply, political instability and inflation constant, current account position would be down by ₦44752.12 million. A unit increase in fiscal deficit would result to ₦1.52 million rise in current account. This agrees with the finding of [6] but refutes the result of [3] in Nigeria. A percentage volatility in exchange would amount to ₦2041.22 million up surge in current account. This confirms the results of studies conducted in Nigeria by [1], [6] and [3]. A unit rise in inflation rate would decrease current account balance by ₦1505.48. A percentage rise in prime lending rate would result to a 46.39 million reduction in current account and in unison with the works of [6] and [3]. A percentage increase in gross domestic product growth increases the current account by ₦24.87 million while a percentage increase in money supply reduces the current account by ₦165.71 million. Political instability experienced in the country within the period covered by this study does not deter affects current account performance rather it improved current account by ₦58, 552.36 million each time there was military coup.

The Adjusted R-squared is an insinuation that only 54.68% changes in current account was as a result of changes in fiscal policy and exchange rate volatility. This is significant at 5% significance level as revealed by the p-value of the F-statistic of 0.00 in Table 4.4. Conversely, the Durbin Watson value of 1.95 is quite close to the benchmark of 2.0 suggesting therefore, that there is no autocorrelation problem among the residuals. That notwithstanding, the serial correlation test in Table 4.2a shows that the variables in the model are not serially correlated. The serial correlation LM test is preferred to Durbin Watson in testing autocorrelation in any stated model. The result of the serial correlation LM test overrides any value of Durbin Watson with respect to autocorrelation in a model.

4.5 VAR Lag Order Selection Criteria and Long Run Linkage

4.5.1 VAR lag order selection criteria

Prior to estimating the long run linkage between current account, fiscal deficit and exchange rate volatility, the optimal level of time lag was ascertained using the Vector Auto Regression model. The essence of this test is to ensure the reliability of long run linkage between variables of interest. The lag order selected automatically the computer E-view software 8.0 is three (3) as summarized in Table 4.5a.

4.5.2 Long run linkage

The unit root test as in Table 4.5b suggested that the variables are free from stationarity defects thus, allowing for analysing the long run linkage

Table 4.4. OLS regression for current account, fiscal policy and exchange rate dependent variable: Current account

Variable	Coefficient	Std. error	t-statistic	Prob.
C	-44752.12	336416.9	-0.133026	0.8950
FD	3.362516	3.231434	1.040565	0.3054
ERV	3975.957	6450.883	0.616343	0.5418
IFR	-5738.426	10918.16	-0.525585	0.6026
PLR	-239.5217	540.7802	-0.442919	0.6606
GDP	24.87382	25.36091	0.980794	0.3336
MS	-165.7076	74.78016	-2.215930	0.0335
POL	58552.36	469225.4	0.124785	0.9014
CA(-1)	0.940430	0.186912	5.031411	0.0000
CA(-2)	-0.215412	0.209593	-1.027763	0.3113
R-squared	0.641698	Mean dependent var		540677.1
Adjusted R-squared	0.546853	S.D. dependent var		1481398.
S.E. of regression	997220.4	Akaike info criterion		30.66005
Sum squared resid	3.38E+13	Schwarz criterion		31.06555
Log likelihood	-664.5210	Hannan-Quinn criter.		30.81043
F-statistic	6.765777	Durbin-Watson stat		1.958772
Prob (F-statistic)	0.000017			

Source: Computer output data using E-views 8.0

between current account, fiscal deficit and exchange rate volatility in the context of Nigeria data. The result of the Johansen co-integration test in Table 4.5b depicts that the trace and max-eigenvalue test indicate the presence of five (5) and four (4) co-integrating equations respectively at 5% level of significance. The implication of this result is that current account, fiscal deficit and exchange rate volatility are linked in the long run. In other words, there is a long run relationship between current account position, fiscal policy and exchange rate volatility in Nigeria.

4.5.3 Normalized Co-integrating equation

The negative normalised coefficient of -12.2156 and -16614.15 in Table 4.5c and 4.5d for fiscal policy and exchange rate volatility is indication that rising fiscal deficit and exchange rate volatility will in the long run tremendously affect the current account position of Nigeria. The fact that rising fiscal deficit and exchange rate volatility does not negatively relates with current account position in the short run as shown in Table 4.4 should not amount continuous and increasing deficit and depreciation of the exchange rate.

Table 4.5a. VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2766.919	NA	1.56e+46	129.0660	129.3937	129.1868
1	-2484.053	447.3222	6.22e+41	118.8862	121.8352	119.9737
2	-2405.410	95.10369	4.31e+41	118.2051	123.7754	120.2593
3	-2214.816	159.5667*	3.14e+39*	112.3170*	120.5087*	115.3379*

*Source: Computer analysis using E-views 8.0. * indicates lag order selected by the criterion, LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion.*

Table 4.5b. Johansen Co-integration result for CA, FD, ERV, PLR and IFR

Unrestricted Co-integration rank test (Trace) CA, FD, ERV, PLR and IFR				
Hypothesized number of CE(s)	**Eigen value**	**Trace statistic**	**0.05 critical value**	**Prob.****
None *	0.803801	269.4088	159.5297	0.0000
At most 1 *	0.743143	197.7493	125.6154	0.0000
At most 2 *	0.715334	137.9431	95.75366	0.0000
At most 3 *	0.504142	82.65976	69.81889	0.0034
At most 4 *	0.452171	51.79525	47.85613	0.0204
At most 5	0.382236	25.31639	29.79707	0.1504
At most 6	0.087864	4.123810	15.49471	0.8933
At most 7	0.001755	0.077280	3.841466	0.7810
Unrestricted Co-integration rank test (Maximum eigen value CA, FD, ERV, PLR and IFR				
Hypothesized number of CE(s)	**Eigen value**	**Maximum eigen statistic**	**0.05 critical value**	**Prob.****
None *	0.803801	71.65948	52.36261	0.0002
At most 1 *	0.743143	59.80629	46.23142	0.0011
At most 2 *	0.715334	55.28329	40.07757	0.0005
At most 3	0.504142	30.86451	33.87687	0.1098
At most 4	0.452171	26.47886	27.58434	0.0687
At most 5 *	0.382236	21.19258	21.13162	0.0490
At most 6	0.087864	4.046529	14.26460	0.8544
At most 7	0.001755	0.077280	3.841466	0.7810

Trace test and Max-eigenvalue test indicate 5 and 4 co-integrating eqn(s) respectively at the 0.05 level;
* denotes rejection of the hypothesis at the 0.05 level; **MacKinnon-Haug-Michelis (1999) p-values.

Table 4.5c. 1 Co-integrating equation(s)

CA	FD	ERV	IFR	PLR	GDP	MS	POL
1.000000	[-12.2156]	[4131.953]	[18730.69]	[-1249.431]	[-2.663939]	[137.8664]	[-319362.6]
	(3.42480)	(4995.63)	(7895.56)	(473.275)	(17.0484)	(50.8531)	(402741.)

Source: Computer analysis using E-views 8.0. The Normalised Co-integrating coefficients are in [ ] while the standard error in ( )

Table 4.5d. 2 Co-integrating equation(s)

CA	FD	ERV	IFR	PLR	GDP	MS	POL
1.000000	0.000000	[-16614.15]	[1610.164]	[4440.521]	[7.182823]	[186.8134]	[-39023.24]
		(4825.37)	(7946.66)	(475.741)	(15.6916)	(48.5415)	(403607.)
0.000000	1.000000	[1698.332]	[1401.533]	[-465.7949]	[-0.806083]	[-4.006930]	[-22949.34]
		(465.371)	(766.397)	(45.8817)	(1.51334)	(4.68147)	(38924.9)

Source: Computer analysis using E-views 8.0. The Normalised Co-integrating coefficients are in [ ] while the standard error in ( )

Table 4.5e. Vector error correction model

Variables	Coefficient	Standard error	t-Statistic
C	546962.9	226172	2.41835
D(CA(-1))	0.619426	0.13778	4.49579
D(CA(-2))	-0.484242	0.13756	-3.52028
D(FD(-1))	1.071508	2.73354	0.39198
D(FD(-2))	-3.095731	2.08604	-1.48402
D(ERV(-1))	753.1822	11228.8	0.06708
D(ERV(-2))	-39563.60	15647.7	-2.52840
D(PLR(-1))	4916.354	6721.53	0.73143
D(PLR(-2))	2782.631	6983.99	0.39843
D(IFR(-1))	941.1620	527.472	1.78429
D(IFR(-2))	2437.127	398.284	6.11907
D(GDP(-1))	8.190545	43.7352	0.18728
D(GDP(-2))	24.20380	41.8195	0.57877
D(MS(-1))	-1052.327	284.694	-3.69634
D(MS(-2))	-169.3528	312.604	-0.54175
D(POL(-1))	-6057.789	232758	-0.02603
D(POL(-2))	36929.18	237736	0.15534
ECM (-1)	-0.023234	0.00834	2.78521

Source: Computer analysis using E-views 8.0

4.5.4 Short run dynamics

If it is confirmed that there is a long run linkage between variables of interest, it is advisable to also test the speed of adjustment in the short run. This speed of adjustments was determined using the VAR Error Correction Model (VECM) and disclosed in Table 4.5e. The error correction model of VAR determines whether or not all the variations in dependent variable is as a result of the co-integrating vectors trying to return to equilibrium and the error correction term that captures this variation. The error correction coefficient is negative which is the expected sign reflecting that there is a tendency by the model to correct and move towards the equilibrium path following disequilibrium in each period and by implication, there are adjustments to instability in the short term. Only 2.32% of the error generated in the previous year is corrected in the current year.

4.5.5 Variance decomposition

This study undertook the variance decomposition test to determine whether it is fiscal policy or exchange rate volatility that exerts greater influence on current account. From the result in Table 4.5f, it is crystal clear that exchange rate volatility is greater in explaining the variations in current account compared to fiscal policy. Variation in current account are more attributed to changes in current account itself.

4.6 Current Account Determinants

In evaluating whether fiscal policy and exchange rate volatility in the presence of uncertainty and fluctuation in prime le ding rate and inflation rate, the granger impact assessment test was estimated and the outcome disclosed in Table 4.6. From Table 4.6, there is unidirectional relationship between current account and exchange rate volatility at 5% significance level. Causality runs from current account to exchange rate volatility. This implies that exchange rate volatility does not significantly affect current account position that is, exchange rate volatility is not a determinant of current account in Nigeria within the period studied. This result is sharp contrast to the finding of [1] that exchange rate is a significant factor for enhancing Nigeria's current account position but agrees with the work of [14] that exchange rate does not determine current account balance in Jamaican economy. However, it is current account position that determines exchange rate volatility. The implication of insignificant p-value of F-statistic is that fiscal policy is also not a determinant of current account within the period covered. Another relevant outcome of the granger impact analysis is that prime lending rate is a determinant of current account in Nigeria as evidenced by the F-statistic of 26.77 and p-value of 0.00 (significant at 1% level of significance). Furthermore, current account position exerts significant effect on money supply in Nigeria. Gross domestic product growth and military coups significantly does not affect current account position.

Table 4.5f. Variance decomposition of current account

Period	S.E.	CA	FD	ERV	IFR	PLR	GDP	MS	POL
1	590628.5	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	1351654.	96.32345	0.198761	2.338518	0.043053	0.510617	0.029194	0.525270	0.031139
3	1768210.	85.01242	1.780505	2.961732	0.170716	8.893454	0.334036	0.533915	0.313217
4	2153394.	74.32012	2.015621	3.485825	0.128149	16.74227	1.417189	1.499768	0.391060
5	2350150.	67.59653	4.631534	7.233040	0.143580	16.56057	1.828883	1.573349	0.432513
6	2507758.	62.93556	5.733120	9.703745	0.264145	17.47168	1.880009	1.565387	0.446349
7	2718637.	57.60856	8.741476	13.58732	0.224847	16.29725	1.724617	1.433978	0.381955
8	2856133.	53.99580	11.35235	12.91955	0.229126	18.12635	1.619763	1.410947	0.346115
9	2999608.	50.74568	11.72314	11.73987	0.213729	22.16549	1.497104	1.587247	0.327733
10	3094986.	49.26273	11.53335	11.20496	0.217508	24.29120	1.436792	1.686952	0.366503

Source: Computer analysis using E-views 8.0.

Table 4.6. Granger causality test current account, fiscal policy and exchange rate

Null hypothesis:	Obs	F-statistic	Prob.	Remarks
FD does not Granger Cause CA	44	0.13354	0.8754	No Causality
CA does not Granger Cause FD		0.39599	0.6757	No Causality
ERV does not Granger Cause CA	44	1.06662	0.3540	No Causality
CA does not Granger Cause ERV		3.47904	0.0407	Causality
PLR does not Granger Cause CA	44	26.7743	0.0000	Causality
CA does not Granger Cause PLR		0.40494	0.6698	No Causality
IFR does not Granger Cause CA	44	0.02049	0.9797	No Causality
CA does not Granger Cause IFR		0.53465	0.5901	No Causality
GDP does not Granger Cause CA	44	0.15662	0.8556	No Causality
CA does not Granger Cause GDP		0.45747	0.6362	No Causality
MS does not Granger Cause CA	44	0.73722	0.4850	No Causality
CA does not Granger Cause MS		33.8885	0.0000	Causality
POL does not Granger Cause CA	44	0.10586	0.8998	No Causality
CA does not Granger Cause POL		0.68025	0.5124	No Causality

Source: Computer analysis using E-views 8.0

4.7 Test of Hypothesis

4.7.1 Decision criteria

If the F-statistic in Granger causality test is greater than 0.05, the null hypothesis is accepted. On the contrary, if the F-statistic in Granger causality test is less than 0.05, the null hypothesis is rejected.

The granger impact assessment result in Table 4.6 upheld the null hypothesis that fiscal policy and volatility in exchange rate are not determinants of Nigeria's current account. This null hypothesis would not be rejected on the bases that p-values of F-statistic for fiscal policy and exchange rate volatility are insignificant at 5% level of significance.

5. CONCLUSION

This study evaluated the long run linkage between current account, fiscal policy and exchange rate volatility amidst fluctuation in prime lending rate and inflation rate over a period of forty five years that is, from 1970 to 2015. Additionally, whether fiscal policy or exchange rate volatility determines of Nigeria's current account was assessed. The data for the analysis were sourced from the Central Bank of Nigeria statistical bulletin of 2005 and 2015 respectively. The data were diagnosed for heteroskedasticity, serial correlation, Ramsey Reset and multicollinearity. Johansen co-integration was used in evaluating the long run linkage, short run and long run dynamics by VAR error correction model and determinants of current account by granger impact assessment analysis. The result of the Johansen co-integration in Table 4.5b revealed the current account, fiscal policy and exchange rate volatility amidst fluctuation in prime lending rate and inflation are connected in the long run. The negative normalised coefficient in Tables 4.5c and 4.5d depicted that rising fiscal deficit and exchange rate volatility will in the long run tremendously affect the current account position of Nigeria. The granger impact assessment analysis in Table 4.6 disclosed that

fiscal policy expressed and exchange rate are not determinants of Nigeria's current account. The variance decomposition in Table 4.5f envisaged that exchange rate volatility is greater in explaining the variations in current account compared to fiscal policy. The null hypotheses that fiscal policy and exchange rate volatility does not determine current account in Nigeria would not be rejected on the premises that the p-values of F-statistic for fiscal policy and exchange rate volatility are insignificant at 5% level of significance.

6. RECOMMENDATIONS FOR PRESCRIPTION AND LIMITATIONS

6.1 Recommendations for Prescription

Considering the negative influence of fiscal deficit and exchange rate volatility on current account in the long run, government should stop further budget deficit and ensure stability in the exchange rate. With respect to the significant impact of prime lending rate on current account, the Central Bank of Nigeria should reduce the minimum rediscount rate which determines the prime lending rate. A lower prime lending rate will lead to increased economic production which in turn improves the current account position.

6.2 Limitation

The analysis in this study was performed using up to date time series data, the use of quarterly data is suggested for further studies. Furthermore, independent assessment of other macroeconomic factors on current would bring out macroeconomic fundamentals that its management could be a priority to the government as significant impact of them would be established statistically. The effect of import restriction placed on certain commodity on current account position few months after the inauguration of president Muhammed Buhari in 2015 was not accounted for in this study.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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