

## Naira to Dollar Exchange Rate Fluctuations and Nigeria's Balance of Payment



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**ABSTRACT:** The authors analyze how changes in the value of the naira affect the country's overall trade surplus or deficit. The 2020 edition of the Central Bank of Nigeria Statistical Bulletin was consulted for data on the country's balance of payments, exchange rate, trade openness, and inflation rates. Exchange rate, exchange rate fluctuation, trade openness, and inflation rate are the independent variables, and the balance of payments (BOPs) is the dependent variable. The model's variables' stationarity was determined using the ADF unit root test method. The results of the tests show that after the first difference, the balance of payment and the inflation rate stabilized, while the actual exchange rate, exchange rate fluctuation, and the degree of trade openness all remained stable at their respective levels. The study's dependent and independent variables' long-term relationship was estimated using an autoregressive distributed lag bounds test. There is a long run link between the study's dependent and independent variables, as evidenced by the estimates' F-statistics value of 4.85, which is larger than the lower and upper critical bounds of 3.23 and 4.35. Estimates also reveal that in the long run, the balance of payment in Nigeria is positively impacted by exchange rate fluctuations and the real exchange rate, while it is negatively impacted by inflation and trade openness. As a result, the study suggests that government should subsidize farmers who produce export goods in order to reduce the volatility of naira to dollar exchange rate. The national government should put aside more funds to increase the nation's foreign reserve in order to reduce the volatility of the currency exchange rate. Rigid taxes on imported goods are one way to prevent heavy reliance on them.

**KEYWORDS:** Balance of Payments, exchange rate, Naira to Dollar exchange rate fluctuation, Trade openness.

### 1. INTRODUCTION

Exchange rate plays an important part in international economic transactions since no nation can remain in autarky (also known as a closed economy without any form of foreign trade) due to the variable factor endowments that exist in each nation (Echekoba, 2017). The fact that the price systems of two distinct countries are connected by the exchange rate, which enables international trade to conduct direct comparisons of items that are being traded, is the primary reason for the significance of the exchange rate. In other words, it connects prices in home markets with prices in global markets.

Due to the devastating effects that it has on the economy of underdeveloped countries like Nigeria, fluctuations in exchange rates have recently taken the spotlight as the primary topic of discussion in contemporary publications on international finance. Exchange rate fluctuations have a domino impact on a number of other economic factors, including unemployment, inflation, interest rates, and the amount of money in circulation, amongst others. These statistics provide light on the significance of currency exchange rates to the overall economic health of any nation that engages in international trade of goods and services (Oladipupo and Onotaniyohuwo, 2011). When an economy's imports are higher than its exports, the nation's currency will have a negative balance of payments, which will lead to a devaluation of that nation's currency relative to the currencies of other countries that participate in international trading, and vice versa (Nkemdilim and Azuka, 2021). As a consequence of this, countries who want to achieve their macroeconomic objectives of having healthy external balances, which are represented in their balance of payments (BOP) situation, find that it is absolutely necessary to articulate an exchange rate strategy.

According to Jose and Anders (2021), the term "balance of payments" refers to the profit and loss account of a nation in relation to the economies of other nations. They made the observation that there are three components that make up the balance of payments account. These components are the financial account, the capital account, and the current account. Jhingan (2012) also

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noted that credit entries are the default designation for transactions that involve payments made to a country by nonresidents of that country. Debt entries are those that involve payments made by a country to individuals who do not dwell there.

It is necessary that a country controls and regulate its transactions from time as it goes a long way in determining the level of growth and development of an economy. To do this therefore, close attention ought to be paid to vital macroeconomic variables especially the exchange rates. Meade (1951) pointed out that to maintain both internal and external balance, a country must control both its aggregate expenditure and its exchange rate.

The fluctuations in Nigeria's exchange rate may affect its balance of payment position. The Nigerian BOP has experienced major fluctuations over the years. Exchange rate in Nigeria was ₦0.61, ₦0.67 and ₦0.72 while BOP was (₦3,020.8m), (₦1,398.3m) and (₦301.3m) in 1981, 1982 and 1983 respectively. The exchange rate has since been on the increase, averaging ₦226 from 2013-2018. BOP on the other hand has been on an unstable negative trend, averaging (₦1,284m) from 2013 to 2017 (CBN, 2018). As at 2019 and 2020, Nigeria's average monthly exchange rate stood at N307.00 and N381 to \$1 while its balance of payments stood at N-15.8bn and N-17.0bn. Depreciation in a nation's currency is supposed to encourage export and discourage import (Jhingan, 2016), thereby improving the balance of payment, however, the Nigeria BOP has still been in deficit despite the devaluation and depreciation of the Naira.

## 2. LITERATURE REVIEW

Several studies have been conducted to investigate the effects that shift in the balance of payments and exchange rates have on economies. Despite the large number of empirical studies that have been conducted on the topic, it is still unclear how changes in exchange rates affect a country's overall balance of payments. Ruth (2020) used secondary annual data that she collected from the CBN and NBS in an effort to estimate the influence that shifts in the exchange rate have on the pace of economic growth in Nigeria. The study reveals, via the use of the classical least regression model and the ordinary least square approach, how significant swings in exchange rates are to the overall expansion of Nigeria's economy. Additional findings from the study indicate that factors such as interest rate, inflation rate, trade, and currency rate may all have a direct influence on the expansion of the economy in Nigeria. Given the information presented above, the research comes to the conclusion that there is a requirement to create an efficient exchange rate regime given that fluctuations in exchange rates have a direct impact on the economy. However, while this empirical study and the one we are currently conducting share many similarities, they are not the same. They have various dependent or explanatory factors that are distinct.

Using annual data on exchange rate, trade openness, imports, exports, and balance of payment for the period 1981-2015, Okeke (2018) explored the impact of exchange rate on balance of payment in Nigeria. The data used for this investigation covered the period from 1981 to 2015. The Statistical bulletin published by the Central Bank of Nigeria served as the repository for the time series data. The dependent variable in this study was the balance of payments, and the independent variables were the other variables. During the course of the research, an Ordinary Least Square (OLS) technique was utilised, and a unit root analysis was carried out to determine whether or not the variables were stationary. In order to determine the directions of causality, the Granger causality test was also carried out. The findings of the study indicate that exchange rate and export have positive correlations with Nigeria's balance of payment. The findings also indicate that import and trade openness have negative relationships with Nigeria's balance of payment. Accordingly, one of the recommendations made by the study was that the government of Nigeria should, to the greatest extent possible, stimulate the local manufacture of the majority of the items that are imported into Nigeria. Import substitutes are one option for accomplishing this goal.

The most evident disadvantage of this study is that it was based on data the results of which may now be obsolete due to more recent developments in Nigeria's balance of payment position. This is one of the study's clear flaws. The method of data analysis that was used in the study is unable to generate robust and dependable results, which are necessary for the creation of successful policies.

Nwanekezie and Onyiro (2018) investigated the effect that fluctuations in the currency rate have on Nigeria's balance of payments. They used annual data ranging from 1981 to 2016 for their study. The primary objective of the study was to determine the degree to which fluctuations in currency rates had an effect on Nigeria's balance of payment. In order to accomplish this, the study applied the cointegration and ECM method to the process of analysing annual aggregate data for the time period spanning 1981 to 2016. The ADF unit root test, which was used to determine the stationarity level of the data, showed that all of the variables became stationary after the first difference. As a result, the Johansen-Juselius co-integration technique was utilised in order to test whether or not the variables in the model have any long-run relationships with one another. The findings of the cointegration test

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indicated the presence of a link between the variables over the long term. According to the findings of the research, the systematic shifts in Nigeria's balance of payments could be accounted for by the country's nominal exchange rate, inflation rate, real interest rate, and total government expenditure. These factors are considered independent variables. The dependent variable is Nigeria's balance of payments. The findings of the study also demonstrated the existence of a long-term connection between fluctuations in the value of the naira and Nigeria's overall balance of payments. As a result, the study suggested a number of different things, including discouraging an excessive dependency on imported items and encouraging the export of commodities that are created domestically. In addition, it was suggested that the economy of Nigeria be diversified, and that the development of entrepreneurial activity be encouraged throughout the country, in order to accomplish this goal.

Mohammed and Nuhu (2020) also analyse the impact of exchange rate on balance of payment in Nigeria utilising annual data that was taken from World Bank development indicators for the time frame extending from 1986 to 2019. During the course of the data analysis, quantile regression and the Granger causality method were utilised. According to the findings of the quantile regression, the balance of payment is negatively impacted by both the openness of the economy and the currency rate, while it is positively impacted by foreign direct investment. The outcome of the Granger causality test revealed that there is a unidirectional chain of causation running from the exchange rate to the balance of the balance of payments. According to the findings of the study, the Central Bank of Nigeria should develop a more effective analytical framework in order to preserve a stable exchange rate. In addition, amongst other recommendations, the research suggests that the money currently in circulation should be managed correctly.

In a manner not dissimilar to this, Ehekoba (2017) investigates the influence that changes in exchange rates have on Nigeria's balance of payments. Publications from both the CBN and NBS Service provided the data (1990 to 2013) used. In this particular study, the methods of analysis that were utilised included multiple regression and the unit root test. The findings of the study indicated that fluctuations in foreign exchange rates, in general, have an effect on several of the variables that are used to measure the economy's overall health. According to the findings of the study, in order to stimulate growth in non-oil exports, it is essential for the government to strike an appropriate balance between its monetary and fiscal policies. According to the findings of the study, a market-driven exchange rate is the most effective way to address imbalances in Nigeria's balance of payments, and it also has the potential to boost exports.

The obvious limitation of the three (3) preceding studies is that the technique of data analysis that was used may have affected their outcome. The Auto-regressive Distributive lag (ARDL) co-integration approach was utilized in the current empirical study.

In their analysis, Nkemdilim and Azuka (2021) examined annual time series data ranging from 1986 to 2019 in order to investigate how persistent exchange rate variations effect economic performance in the nation. The (ARDL) technique was utilized in the research so that the authors could investigate both the short-term and the long-term effects that fluctuations in the exchange rate have on the rate of economic expansion in Nigeria. The findings of the study showed that factors such as inflation rate, net direct foreign investments, and exchange rate all had a statistically significant negative influence over the long run on Nigeria's overall economic growth. According to the findings of the study, significant swings in the country's currency exchange rate are detrimental to the country's efforts to expand its economy. On the basis of this information, it was recommended in the study that Nigeria should diversify her exports in the agriculture and agro-investment sectors. Additionally, it was recommended that the foreign exchange system should be influenced by the state through reforms that would curb the negative effects that an erratic foreign exchange rate system would have on the economy of Nigeria.

The authors of the previous study model, Nkemdilim and Azuka, used economic growth as the dependent variable in their model, whereas the dependent variable in the model of our study is balance of payment. It is vital to take note of this difference.

The relationship that exists between exchange rate volatility and non-oil exports was evaluated by Uduakobong and William (2018) who employed annual data spanning the time frame from 1970 to 2015. It was revealed that it will require four (4) years for Nigeria's non-oil export to adjust back to equilibrium. It is important to note that while this empirical study and the one we are currently conducting share some similarities, they are not the same. They have various explanatory factors that are distinct.

### **3. METHODOLOGY AND SOURCE OF DATA**

#### **A. Research Methodology**

The research design utilized in this study is the post-hoc research design. This study strategy is employed when the researcher aims to establish a cause-and-effect relationship between independent and dependent variables (Kerlinger, 1970).

#### **B. Model Specification**

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The Mathematical Model for this research is given as:

$$BOPs = f( EXCHFL, RER, TROP, INFL) \dots\dots\dots 1$$

Expressing the above functional relationship into an econometric model, we have:

$$BOPs = \beta_0 + \beta_1 EXCHFL + \beta_2 RER + \beta_3 TROP + \beta_4 INFL + \mu \dots\dots\dots 2$$

Where:

BOPs = Balance of payments

EXCHFL= Exchange rate fluctuation

RER = Real exchange rate

TROP = Trade openness

INFL = Inflation rate

$\mu$  = Error term

$\beta_0$ = Constant term/ Intercept

$\beta_1, \beta_2, \beta_3, \beta_4$  = Coefficients of the independent variables

### C. Method of Data Analysis

The study examines the impact of naira to dollar exchange rate fluctuation on balance of payment in Nigeria. The study employed balance of payment as the dependent variable while inflation, naira to dollar exchange rate fluctuation, real exchange rate, and trade openness are employed as the independent variables. In order to have a proper analysis, the estimated regression results are based on the Auto-regressive Distributive lag (ARDL) co-integration approach developed by Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001).

## 4. PRESENTATION AND DISCUSSION OF RESULTS

### A. Presentation of Results

The table that follows is an example of a test known as the unit root test. This test is used to determine whether or not the data that were gathered for the research are stationary.

**Table 4.1 ADF Unit Root Test Result**

Variable	ADF Statistics		Order of Integration
	Level	1 <sup>st</sup> difference	
<b>BOP</b>	-2.873356-3.516817		I(1)
<b>EXFLU</b>	-4.592940	-	1(0)
<b>RER</b>	-3.989784	-	I(0)
<b>INFL</b>	-2.718358	-4.904566	I(1)
<b>TROP</b>	-3.352122	-	I(0)

Source: Author's computation

NOTE: \*, \*\* means 1% and 5% significance

The sequence of integration of the variables in this study is shown to be inconsistent throughout.

Balance of payment and inflation rate are stationary at 1<sup>st</sup> order difference 1(1), while exchange rate fluctuation, real exchange rate and trade openness were stationary at level 1(0). In light of this information, the Autoregressive Distributed Lag (ARDL) approach was utilized to estimate the values of the model's parameters. It also serves as the foundation for the application of the ARDL Bounds Test, which is used to determine whether or not there is a connection that exists between the variables over the long run.

### B. ARDL Bound Test

The ARDL Bound co-integration test is used to determine the degree to which the investigated time series variables are cointegrated.

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Table 4.2 ARDL Bound Test

Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	4.847657	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.82	3.67
5%	3.33	4.25
2.5%	3.79	4.79

Source: Authors computation

From the results presented in table 4.2, the F-statistics is greater than the lower and upper bound value at 5% level. As a consequence of this, there is a link between the variables of the model in the long term.

### C. ARDL Long Run Model

The long-run and short-run estimates for the model parameters are presented in Tables 4.3 and 4.4, respectively, below.

Table 4.3: Summary of Long Run Coefficient Using ARDL Mechanism

Dependent Variable: BOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
BOP(-2)	-0.686099	0.228299	-3.005269	0.0067
EXFLU	16796.42	4896.833	3.430058	0.0034
RER	253.6534	148.987	1.70252	0.1034
RER(-1)	-244.6381	175.5655	-1.39343	0.1781
RER(-2)	246.0738	125.8641	1.955075	0.064
INFL	-1493.87	536.6042	-2.783932	0.0111
INFL(-1)	1132.814	461.2056	2.456201	0.0228
INFL(-2)	-881.2769	363.499	-2.424427	0.0244
TROP	-13.2469	562.8075	-0.023537	0.9814
C	-15936.08	27702.14	-0.575265	0.5712

$R^2 = 0.733671$  Adjusted  $R^2 = 0.676673$  D.W. = 2.274989 F-stats. = 4.036166 Prob.(F-stats) = 0.004025

Source: Author's computation using E-view 9

Substituting these values into our regression model, we have:

$$\text{BOPs} = -15936 + 16796.42\text{EXFLU} + 253.6534\text{RER} - 1493.870\text{INFL} - 13.24690\text{TROP} + \mu$$

### D. Interpretation of Result of Long-run ARDL Model

According to the coefficient of determination, which is a measure of how well the model fits the data, and which is shown by the R-square (R2) statistic, the independent variables were responsible for explaining 73% of the observed variations in the balance of payment. It is considered that the error term,, accounts for the remaining 27% of the mystery that cannot be solved. Additionally, its adjusted equivalent is 0.676, which indicates that around 67.6 percent of the expansion in Nigeria's balance of payment may be attributable to the explanatory variable.

The coefficient for the constant term is 15936.08, which is negative. When all other independent variables are considered to be zero, the number suggests that the BOP will decline by around 15936.08 units. The fluctuation in exchange rate showed a coefficient of 16796.42. According to the figure presented, a change of one unit in the currency exchange rate will likely result in a change of around 16796.42 units in the BOP in Nigeria. According to the findings, the real exchange rate had a coefficient of

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253.65; this indicates that an increase of one unit in the real exchange rate will lead to a rise of around 253.65 units in BOP in Nigeria in the long run. The current value of the inflation rate coefficient is -1493.87, which indicates that an increase of one unit in the INFL will result in a fall of about 1493.87 units in the BOP. In the long term, there is a negative connection between trade openness and the balance of payment, with a coefficient of -13.2469 units; however, this relationship does not satisfy the standards for statistical significance at the 5% level of significance because its p-value is 0.9814. It goes against the theoretical postulation that there is a link between the openness of trade and the balance of payments. In principle, we anticipate that increased trade openness will have a constructively large impact on the stimulation of the balance of payment; yet, the results report otherwise.

The F-statistic for the study came in at 4.036, and its p-value was 0.004025, which indicates that the model had a good overall significance for the study. In a similar vein, the p-value for the model was 0.004025. In other words, the explanatory factors are concurrently crucial in anticipating changes in the balance of payment in Nigeria as well as fluctuations in the currency rate. In addition, the fact that the value of the Durbin-Watson statistic, which was calculated to be 2.27, was obtained illustrates that the model that was utilized did not include any serial correlation.

### E. ARDL Short Run Model

The short-run output of a parsimonious error correction model (ECM) parameters are presented in Tables 4.4

**Table 4.4: Summary of ECM/Short Run Coefficient Using ARDL Mechanism**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BOP(-1))	0.457784	0.223857	2.04498	0.055
D(BOP(-2))	-0.754281	0.186378	-4.04706	0.0007
D(EXFLU)	15652.73	3978.32	3.93451	0.0015
D(RER)	241.699	107.3597	2.2513	0.0364
D(RER(-1))	-40.6156	126.808	-0.32029	0.7522
D(RER(-2))	247.5529	102.2009	2.42222	0.0256
D(INFL)	-1204.885	538.4676	-2.23762	0.0374
D(INFL(-1))	1097.129	306.6295	3.57803	0.002
D(INFL(-2))	-138.334	440.247	-0.31422	0.7568
D(TROP)	560.9542	555.6978	1.00946	0.3254
ECM(-1)	-0.987474	0.327059	-3.01925	0.0071
C	-783.7033	4237.755	-0.18493	0.8552

*Source: Authors Computation*

According to the short-run estimates, about 98% disequilibrium will be adjusted. Notice also that the coefficient of the ECM has a negative sign as expected and is significant at 5% probability level. Short-run estimates in Table 4.4 further showed that, real exchange rate (RER) had a parameter estimate of 241.699 with p-value of 0.0364, whereas trade openness (TROP) had a parameter estimate of 560.9542 with p-value of 0.3254. Both of these estimates are presented in the context of an examination of the relationship between the two variables. This indicates that real exchange rate and trade openness have positive link with balance of payment in the short-run period. The implication of this finding is that in the short-run a percentage increase in both real exchange rate and trade openness will contribute to balance of payment in Nigeria, to the tune of 241.699 percent and 560.9542 percent respectively.

### F. Discussion and Policy Implications of Findings

For the purpose of this investigation, quantitative techniques such as the Auto-regressive Distributive lag (ARDL) co-integration and the ARDL Bound Test approach were utilized to determine whether or not shifts in the value of the currency exchange rate have had an effect on the balance of payments in Nigeria over the time span under consideration. Following is what we found out as a consequence of our investigations:

i. The exchange rate, had a favourable impact on the balance of payments but did not have a substantial bearing on the situation throughout the time frame under consideration. This indicates that in order to maintain a stable BOP in the country, the monetary authorities have been relying more on policies aimed at reducing expenditures as opposed to policies aimed at switching

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expenditures, such as a devaluation of the country's currency. This is because policies aimed at reducing expenditures tend to have a longer-term effect. The implication here is that a devaluation of currency has the effect of encouraging export and discouraging import. As a result of this, more naira will be demanded on the foreign exchange market for the purpose of importing goods made in Nigeria, which will result in an increase in the exchange rate. This will result in a more favourable situation for Nigeria's balance of payments if the trend continues. This is feasible due to the fact that the value of the Nigerian Naira is rising in comparison to the Dollar in particular and other currencies around the world. As a result, the cost of the nation's exports will go down while the cost of its imports will go up, causing consumers to shift their spending away from international products and toward domestic ones. The country's balance of payments and current account will benefit as a result of this development.

ii. The findings of the study also demonstrated that the balance of payment in Nigeria is considerably and adversely related to the country's inflation rate. By implication, this indicates that the rate of inflation in Nigeria has the potential to have a negative influence on the country's balance of payment.

iii. From the model estimates, trade openness (TROP) coefficient is -13.24690 which show that if the degree of TROP increases by 1 percent, the balance of payments (BOPs) decreases by about 13.25 percent. This estimation does not support the a priori hypothesis of a positive link between TROP and BOPs. This inverse relationship between BOPs and TROP could be attributed to opening Nigerian economy to advanced nations at a tender stage. Nigerian economy export mainly primary products and exchange for finished products with advanced nations of the world. It goes to show the effect of unregulated openness to trade and overdependence on importations of consumable goods and services both in the short run and long run.

iv. Table 4.4's results demonstrate that at the 5% level of significance, the ECM coefficient is -0.987474. This means that almost 98% of the BOPs' inequilibrium from the prior year were resolved this year. A long run equilibrium link between Nigerian BOPs and the independent variables of this study model is indicated and confirmed by the importance of the ECM value. Furthermore supporting the fact that 98% of the previous year's disequilibrium was rectified is the reliability of the mistake correction approach. This suggests that during the study period, Nigeria's BOPs and economic growth tended to be induced by real exchange rate and other factors.

## 5.0 CONCLUSION AND RECOMMENDATIONS

### A. Conclusion

This research work has been able to estimate the impact of naira to dollar exchange rate fluctuation on balance of payment in Nigeria ranging from 1986-202. Justified conclusions were drawn based on the findings of the research.

First, exchange rate fluctuation had positive impact on balance of payment in the short run and in the long run during the period of study. Second, inflation had negative and significant impact on balance of payments at both short run and long run period in Nigeria. Trade openness impact positively and insignificantly on balance of payments in the short-run period, it impact negatively and insignificantly on balance of payments in the long run period.

### B. Recommendations

In connection to the findings of this research, the following recommendations are suggested:

- i. Government should encourage production of export products by providing subsidies to farmers that produce export commodities in order to minimize the level of exchange rate fluctuations in the economy.
- ii. Federal government should save more money to boost the country's foreign reserve, as this will help curb exchange rate fluctuations in the country.
- iii. High dependence on import should be discouraged by imposing stern tariffs on import items.

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