

Analysis of the Impact of Exchange Rate on Balance Of Payments in Nigeria

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ABSTRACT

This paper sort to analyse the impact of exchange rate on balance of payments positions in Nigeria, using the secondary data sourced from Central Bank of Nigeria Statistical Bulleting (1981-2021) in its analysis. The study employed Auto-Regressive Distributive Lag (ARDL) to estimate the short run and long run impact of Exchange Rate on Balance of Payment (BOP) in Nigeria. The Auto-Regressive Distributive Lag (ARDL) bound co-integration test showed a Long Run relationship between Exchange Rate and Balance of Payment in Nigeria. The empirical result eventually showed that exchange rate has negative and significant impact only in the long run in Nigeria. The study recommends that the policy makers should take keen interest on how best to improve the value of Nigeria's export to the world; this will help bring to equilibrium the exchange rates that play a crucial part in determining the balance of payments. Again, appropriate monitoring machineries should be set up to ensure judicious use of credit an available foreign exchange.

KEY WORD: Exchange Rate, Balance of Payment, Purchasing Power Parity, Model Specification, Co-integration Test

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I. BACKGROUND TO THE STUDY

Exchange Rate is the rate at which a country's currency exchanges for another or converted into another. In other words, it is the value of one country's currency in relation to another currency. Each country determines the exchange rate regime that will apply to its currency. For example, a country may be floating, pegged (fixed), or a hybrid. Government can impose certain limits and controls on exchange rates. Countries can also have a strong or weak currency. There is no agreement in the economic literature on the optimal national exchange rate (unlike on the subject of trade where free trade is considered optimal). Rather, national exchange rate regimes reflect political considerations. In floating exchange rate regimes, exchange rates are determined in the foreign exchange market, which is open to a wide range of different types of buyers and sellers, and where currency trading is continuous except on weekends. The spot exchange rate is the current exchange rate, while the forward exchange rate is quoted and traded today but for delivery and payment on a specific future date, (James, C. & Gordon, S. 2021).

An exchange rate is the value of one nation's currency versus the currency of another nation or economic zone. As of September, 2021, the exchange rate is 1.1720, meaning it takes \$1.1720 to buy €1. There is an ongoing debate by policy makers and academics on the appropriate exchange rate regime to achieve macroeconomic objectives of developing and emerging economies. The choice of exchange rate regime has as a wide range of effects on macroeconomic performance and balance of payment position of a country. Deliberate exchange rate appreciation by the monetary authority in an economy with less export could have detrimental effect on real sector, general price level and trade. Since the breakdown of the Bretton Woods' system in 1973, many developed and developing countries had adopted floating exchange rate system. The floating exchange rate regime though has its merits, however, it has resulted to several episodes of volatility in exchange rate with some implications for trade, external reserves, inflation, money supply and economic growth. Nigeria has witnessed several exchange rate policies and regimes; however, these policies had not led to the achievement of a favourable balance of payment position in the country. After the adoption of the Structural Adjustment Program (SAP) in Nigeria in 1986, the foreign exchange market was deregulated. The deregulation policies led to fluctuation in exchange rate. However, the monetary authority frequently intervenes in the foreign exchange market to reduce the extent of depreciation of naira. During the SAP period the balance of payment (BOP)

statistics recorded some deficits. Naira to dollar exchange rate depreciated from N0.99 per dollar in 1986 to N9.00 per dollar in 1990. During the same period, BOP recorded deficits. For instance, between 1985 and 1990, BOP deficits increased from N339.60 million to N4.51 billion. Although the current account was in surplus mainly through the revenue derived from the export of crude oil, a large amount of the deficits incurred were from the capital account. The deficits in the BOP were due to increase importation of food products, textiles, automobiles, machinery and equipment (James, C. & Gordon, S., 2021).

In the mid-1980, when Nigeria started recording huge balance of payments deficits and depletion of the foreign reserve, policy makers were in favour of devaluation of naira. This was expected to reduce pressure on external reserve as well as BOP. However, after the devaluation of naira, the economy was far from recovery. Available statistics from the Central bank of Nigeria (CBN) show that both the current and capital account recorded deficits in 1987, 1988 and 1989. Hence, exchange rate devaluation did not significantly improve external reserve, trade and economic performance in the country. Due to the continuous exchange rate volatility and deficits in balance of payment in Nigeria, the investigation on exchange rate dynamics and balance of payment in Nigeria is still subject to further findings because the persistence changes in exchange rate has increased uncertainty in international trade transactions in the country. After the establishment of the Central Bank of Nigeria (CBN) in 1958 and the enactment of exchange control acts in 1968, Nigeria operated fixed exchange rate regime. Over a decade, after the establishment of CBN, Nigeria's pound was used as the medium of exchange with easy convertibility to British pounds (Egwaikhide, 2015).

The development in the oil sector led to huge foreign exchange earnings in the country in the early 1970s. There was increased in foreign exchange receipts in the foreign exchange market (FEM). By 1975, Naira appreciated against US Dollar following the increased capacity of the CBN to manage foreign exchange from the proceeds derived from oil exploration. Also, the CBN embarked on deliberate action on Naira appreciation to enable the industrial sector to source its inputs from abroad and for the implementation of the Import Substitution Industrialization (ISI) strategy. The exchange rate as at 1980 was 0.54 naira to a dollar. The oil glut in early 1980s, led to crisis in the foreign exchange market. There was excessive demand for foreign exchange with low supply in the foreign exchange market due to the sharp fall in price of crude oil in the international market. As at June 2021, the exchange rate was N411.30 naira to dollar. Currently, precisely January 2022, the exchange rate for CBN N416.61, Access Bank N470.00, Foreign Exchange Market N413.47, MoneyGram N378.52, and Western Union N380.28. At this time, the CBN realized it cannot continue to operate a fixed foreign exchange regime this led to the abolishment of exchange control and some steps were taken to deregulate the foreign exchange market.

The further devaluation of the Naira fostered a market-oriented exchange rate arrangement which led to a fall in the premiums being captured in the parallel market and therefore narrowed the gap between the official and parallel market exchange rates. In 1999 the IFEM was reintroduced in order to improve inter-bank activities in the market. The exchange rate continued to depreciate and in 2001, the Naira-US\$ exchange rate stood at one hundred and eleven Naira. The foreign exchange and exchange rate management in Nigeria has undergone transformation over the years. It has moved from officially pegged exchange rate system between 1970 and 1985 to a market-determined system since 1986. The naira exchange rate is now determined through the foreign exchange market on the basis of demand and supply. The dollar is the intervention currency in the market; while the exchange rates of other currencies are based on cross reference to the naira - dollar exchange rate. The trade-weighted Nominal Effective Exchange Rate (NEER) indices for Nigeria represent the value of the Naira in terms of a weighted basket of currencies. The weights represent the relative importance of each currency to the Nigerian economy. In other words, it represents the share of each of the selected countries in Nigeria's total trade. Therefore, the NEER index measures the average change of the Naira's exchange rate against all other currencies (CBNSBR 2021).

A noteworthy fact about the balance of payments account disequilibrium is the persistent deficit on the services account. For instance, between 2020 and 2021, it rose from N16, 975.92m down to N2, 521.83m and till date, the existence of a deficit in the service account is a phenomenon common to Nigeria economy. As such, Nigeria's balance of payment (BOP) had started to show signs of adverse 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, (CBNSB, 2021).

2001 was also marked by large oil revenues as well as an improvement in the macroeconomic performance of the economy due to the banking sector reform. In early 2009, the Naira depreciated to the extent that the Naira-US\$ exchange rate stood at N170. Thereafter, the exchange rate of the Naira appreciated to one hundred and fifty Naira in 2012 and as at 2013, the Naira-US\$ exchange rate is one-hundred and sixty Naira (CBN report 2013).

Presently Dollar to Naira Exchange Rate as at January 12, 2022 is ₦414.61 in CBN, ₦470.00 in Access Bank, ₦413.47 in FX Market, ₦378.52 in Moneygram, and ₦380.28 in Western Union. US Dollar to Naira rate recently moves upwards 0.04% in CBN, 0.04% in Access Bank, 0.16% in FX Market, 1.99% in Moneygram. Dollar to Naira exchange rate has the lowest value of ₦378.52 at Moneygram as of 2020, now Dollar to Naira exchange rate has the highest value of ₦470.00 at Access Bank as of January 11, 2022 which is the most recent. While some have attributed the recent depreciation to the decline in the nation's foreign exchange reserves, others argued that the activities of speculators and banks are responsible for the recent decline in the value of the naira. In addition, the quest for higher profits in the face of the global economic meltdown is forcing some banks to engage in round-tripping (CBN report January, 2022).

1.3 Objective of the Study

The main objective of this study is to analyze the impact of Exchange Rate on the balance of payment in Nigeria. The sub-objectives include:

- 1.To determine the impact of exchange rates on balance of payment in Nigeria.

II. REVIEW OF RELATED LITERATURE

2.1 THEORETICAL FRAMEWORK

Exchange rate is one of the basic economic tools that are used to correct a number of economic misalignments facing nations. It has been widely applied in most structural adjustment programmes across the world. It has been used as a strategic policy vehicle for directing the direction of flow of economic resources (skilled labour, Capital, managerial know-how, and foreign exchange) into import and export sectors. However, for this to result to sustainable economic growth and development stability must be maintained in exchange rate regime (Schaling, 2008).

Moreover some countries use dual exchange rates systems because of their weak balance of payments situations, rather than devaluation of their currency, this approach sometimes prove costly from a political and social point of view. However, if managed properly, this dual exchange rate policy can be valuable for improving balance of payments of developing countries. These approaches include automatic price adjustment under gold standard, automatic price adjustment under flexible exchange rates (price effect), the elasticity approach, the absorption approach and the monetary approach (Oladipo, 2011).

The Purchasing Power Parity (PPP) in its simplest form asserts that in the long run, changes in exchange rate among countries will tend to reflect changes in relative price level. Kamin&Klau, (2003) are of the view that if exchange rates are floating, the observed movement can be explained entirely in terms of changes in relative purchasing power while if it is fixed, equilibrium can be determined by comparing satisfactory methods for: Explaining the observed movements in exchange rates for countries whose rates were floating, Determining equilibrium parity rates for whose countries whose surviving rates were out of line with post war market conditions, Assessing the appropriateness of an exchange rate. Despite criticisms of PPP theory, the theoretical foundation and explanation may sound reasonable and acceptable but its practical application in real situation may be an illusion, especially in the long run (Grigorianm, 2004).

2.2 EMPIRICAL FRAMEWORK

Different scholars and researchers have reviewed the determinants of balance of payments in different countries. Below are some of the international and local reviews carried out by researchers.

In recent period, Dare and Adekunle (2020) investigated how exchange rate policy affects balance of payment in Nigeria. They adopted Autoregressive Distributed Lag (ARDL) model, similar to Nwanosike et al (2017) and Olanipekun and Ogunsola (2017) to examine both the short run and long run relationship between the variables from 1985 to 2018. The result of ARDL revealed that exchange rate and trade openness have significant effect on balance of payment in Nigeria. The study further tested for direction of causality between balance of payment and exchange rate and the empirical result showed no causality between them.

Limbore and Moore (2019) examined the effect of exchange rates on balance of payments using secondary data from the RBI (Central Bank of India) covering the period of 2001 to 2018. Variables employed are export, import, trade account balance, current account balance and overall balance data which were analyzed using descriptive method. The study found that exchange rate was highly unstable which negatively influenced balance of payments.

Nwanekezie and Onyiro(2018) examined the effect of volatility in exchange rate on balance of payment in Nigeria between 1981 and 2016. However, the study ended up using error correction model (ECM) to estimate the relationship between exchange rate and balance of payment. Co-integration test was conducted using Johansen co-integration test and the result showed evidence of long run relationship between the variables. The ECM result showed that exchange rate has significant effect on balance of payment in Nigeria within the period of study.

Delimus, (2018) examined the effect of exchange rate on balance of payments in Nigeria from 1999 to 2016 using Autoregressive Distributed Lag (ARDL) approach. Findings from the study revealed that nominal exchange rate had significant effect on Nigeria's balance of payments.

Nwanosike, Uzoechina, Ebenyi, . & Ishiwu (2017) employed multivariate regression model to evaluate the effects of devaluation of domestic currency on balance of payments in Nigeria using Marshall-Lerner (ML) condition from 1970 to 2014. The result revealed that, devaluation of exchange rate had negative effect on balance of payments (BOP) through balance of trade mechanism.

Olanipekun and Ogunsola (2017) investigated how exchange rate changes affect total balance of payments, current account balance and capital account in Nigeria. They authors employed Autoregressive Distributed Lags (ARDL) bound co-integration to examine short-run and long effects of exchange rate on trade balance. It was found that exchange rate appreciation affects BOP and current account balance negatively. However, no statistically significant effect of exchange rate on capital account was obtained while inflation rate was found to have adverse effect on BOP in the country.

Lamsso and Masoomzadeh (2017) studied the impact of exchange rate on the balance of payments. The results supported the existence of the J - curve in Sweden, South Africa, Bulgaria, Iran, and Egypt such that increase in exchange rate deteriorates tourism income, and after the primary periods, the increase improves the tourism income.

Ogbonna (2016) examined the empirical relationship between the real exchange rate and aggregate trade balance of Nigeria. This study tests the Marshall Learner conditions to see if it is satisfied for Nigeria. The results suggest no co-integration for the trade balance model. The results further show that depreciation/devaluation improves trade balance and that Marshall-Lerner (ML) condition holds for Nigeria. This is in reversal with empirical the evidence for Nigeria has been inconsistent in either rejecting or supporting ML conditions. This is in line with Orji [2017] that shows a negative relationship between balance of payment and trade openness.

Imoughelle and Ismaila, (2015) showed that the exchange rate has affected the balance of payments in Nigeria; in addition, inflation has a negative effect on the balance of payments stability in Nigeria. (Osisanwo, 2015) in his argument, showed that an increase in gross domestic product and interest rates lead to a greater balance of payment in Nigeria. The balance of payments enhanced economic growth in Nigeria.

Ezirim (2012) investigated the interdependencies between exchange rates and inflation rates behavior in Nigeria. Using autoregressive distributed lag analytical framework, they found that exchange rates movements and inflation spiral are co-integrated, associating both in the short run and in the long run. Thus, indicating that in a regime of inflation targeting policy aimed at exchange rates manipulation becomes a proper monetary action, and vice versa. The present study includes interest rate as one of the explanatory variables given that it is one of the important monetary phenomena, which is a key driver of exchange rate in an economy.

Furthermore, to the best of our knowledge, none of the previous works reviewed, examined the impact of exchange rate on Balance of Payment (BOP) in Nigeria from 1981 to 2021 data statistics from Central Bank of Nigeria (CBN), and National Bureau of Statistic (NBS). For instance, Ezirim (2012) centered on exchange rate and balance of payment, Nwani (2012) only examined balance of payment crisis using demand for money, while Nwanosike et al (2017) examined the effect of devaluation of the domestic currencies on balance of payment. Therefore, this study is filling a gap as by analyzing the impact of Exchange Rate (EXR) on Balance of Payment (BOP) which other studies could not fill as regards to the scope.

III. METHODOLOGY

3.1 MODEL SPECIFICATIONS

Given that this study aims at analysing the impact of selected macroeconomic variables on balance of payments in Nigeria, the functional form of the model specification is specified as:

$$BOP = f(EXR) \dots\dots\dots (3.1)$$

Where: BOP = Balance of payment, EXR = Exchange rate

To estimate the above equation, we transformed the functional form into an estimated model as:

$$BOP_t = \alpha_0 + \alpha_1 EXR_t + \mu_t \dots\dots\dots (3.2)$$

The Auto Regressive Distributed Lag (ARDL) Model which uses a bounds test approach based on unrestricted error correction model (UECM) was employed here to estimate the effects of selected macroeconomic variables on balance of payment in Nigeria. The ARDL model was developed by Pesaran (1997) and used by Pesaran, et al (2001); Masron (2009); Owusu (2012), among others. The major advantage of this approach is based on the fact that it can be applied irrespective of whether the variables are I (0) or I (1). This approach also allows for the model to take a sufficient number of lags to capture the data generating process in a general-to-specific modelling framework. Although, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation, Banerjee et al., 1998 and Pesaran et al., 2001, have introduced bound testing as an alternative to test for the existence of co-integration among the variables. The bounds test procedure is

merely based on an estimate of unrestricted error correction model (UECM) using ordinary least squares estimator. Tang (2003) argues that the UECM is a simple re-parameterization of a general ARDL model. The ARDL model is stated as:

$$BOP_t = \alpha_0 + \sum_{i=0}^q \gamma_i BOP_{t-i} - i + \sum_{i=1}^q \beta_i EXR_{t-i} - i + \mu_{it} \dots \dots \dots (3.3)$$

In order to obtain the co-integrating equation, equation 3.3 is transformed into 3.4 as follows:

$$\Delta BOP_t = \alpha_0 + \sum_{i=0}^p \gamma_i \Delta BOP_{t-i} - i + \sum_{i=1}^q \beta_i \Delta EXR_{t-i} - i + \phi_1 ECT_t + \mu_{it} \dots \dots \dots (3.4)$$

Where $ECT_t = Y_t - \alpha_0 - \sum_{i=1}^p \gamma_i \Delta Y_{t-i} - \sum_{i=0}^p \beta_i \Delta X_{t-i}$ and $\phi = 1 - \sum_{i=1}^p \gamma_i \Delta Y_{t-i} \dots \dots \dots (3.5)$

The Bound test procedure used equations 3.4 and 3.5 into 3.6 as:

$$\Delta Y_t = - \sum_{i=1}^{p-1} \gamma_i Y_t * \Delta Y_{t-i} + \sum_{i=0}^p \beta_i \Delta X_{t-i} - \rho Y_{t-1} - \alpha - \sum_{i=0}^p \delta X_{t-i} + \mu_{it} \dots \dots \dots (3.6)$$

Then we test the existence of level relationship as $\rho = 0$ and $\delta_1 = \delta_2 = \dots = \delta_k = 0$

Where Δ = difference operator, μ = white noise error term.

3.2 UNIT ROOT AND CO-INTEGRATION TEST RESULTS

Since the validity of the ARDL approach relies on $I(0), I(1)$ or a combination of both, it is important to first determine the time-series properties of individual variable that enter equation (3.3). This is done to know whether the variables are integrated of order zero or one or even more. Given that unit root testing procedures have their own limitations. Two unit root tests were considered for this research. These are the non-parametric Philip-Perron (PP) test proposed by Phillips and Perron (1988) and the popular Augmented Dickey-Fuller (ADF) unit root test. Both the ADF and the PP test the null hypothesis that the series have unit root (variables not stationary).

3.3 DATA SOURCE AND ECONOMETRICS SOFTWARE.

The data used in this study obtained from Central Bank of Nigeria (CBN) statistical bulletin 2021, the bureau of statistics 2021. The E-views 10.0 software was used in analysing the data while the Ms-Excel was used to transport the data.

IV. DATA ANALYSIS AND INTERPRETATION

4.1 Unit Root Test

In this study, the Augmented Dickey-Fuller (ADF) unit root test was employed to test for the time series properties of the model variables. This is necessary as it helps to avoid spurious regression results. The ADF tests the null hypotheses that the series has a unit root (not stationary) as against the alternative that the variable has no unit root. The choice of lag length was based on Akaike and Schwartz-Bayesian information criteria and was selected automatically by E-views. The decision rule is to reject the null hypothesis if the ADF statistic value exceeds the critical value at a chosen level of significance (in absolute term). These results are presented in table 1 below.

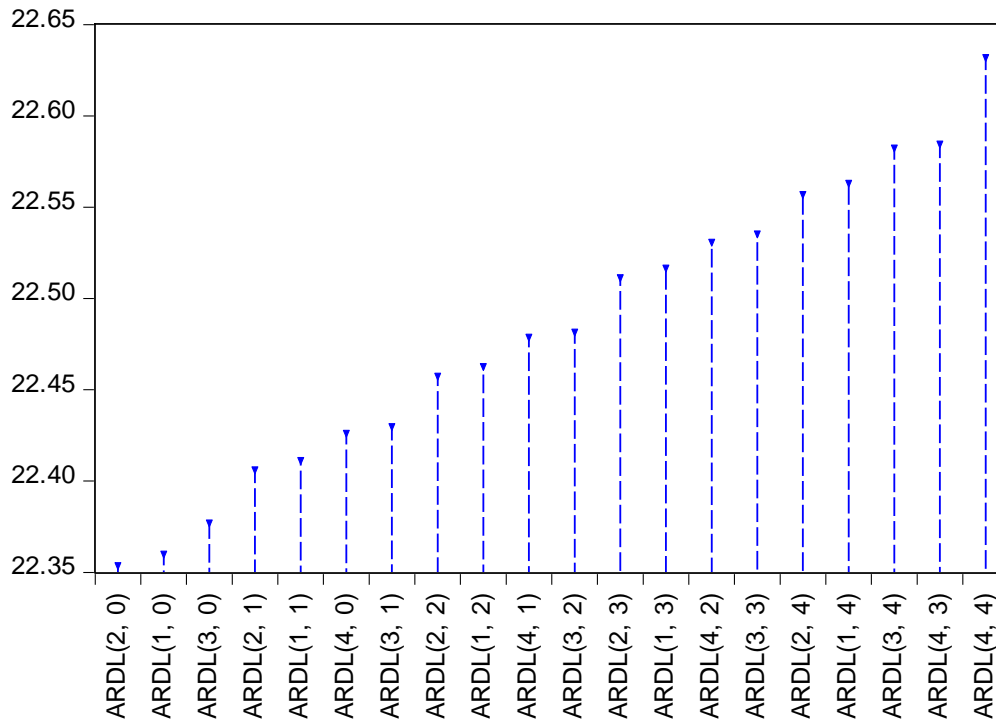
Table 1: Summary of ADF test results at 1% and 5% critical value

Variables	ADF Statistics		ADF Critical Value		Optimum Lag Length	Order of Integration	Remark
	Level	Ist Diff	1%	5%			
BOP	-3.961400		-3.605593	-2.936942	0	I (0)	Stationary
EXR	2.447229	-4.365077	-3.610453	-2.938987	0	I (1)	Stationary

Source: Computed by the Researcher with Eview 10

From table 1 above, observe that the variables EXR, was not stationary at level form but became stationary after first difference which implies that exchange rate is integrated of order one ($I \sim (1)$) whereas BOP was integrated of order zero ($I \sim (0)$) as it was stationary at level form. The decision was based on the fact the ADF statistics was greater than the critical values at 5% significance level. Since the variables are integrated of order one and zero and none of the variables is integrated of order two. We therefore, applied the ARDL bound co-integration test. But before we apply the ARDL bound co-integration test, we first determined the optimum lag length using Akaike information criteria. The result is shown in figure 1 below:

Figure 1: ARDL Optimum Lag Length Selection
Akaike Information Criteria



After twenty (20) models automatically generated, ARDL (2, 0) model was chosen based on Akaike information criteria.

4.2 ARDL Bound Cointegration Test

A necessary condition for testing ARDL bound co-integration test is that the variables be integrated of either of order one or zero or both (Pesaran, Shin and Smith, 2001). Since all the variables were integrated of order one and zero, we proceeded to estimate the ARDL bound test. The null hypothesis of ARDL bound co-integration is that the variables are not co-integrated as against the alternative that they are co-integrated. The decision rule is to reject the null hypothesis if the F-statistics is greater than the upper bound critical values at chosen level of significance. The result of the ARDL bound co-integration test is shown in table 2 below.

Table 2: ARDL Bound Co-integration Test Result

F-Statistics	K	Significance level	Critical Bound Value	
			10 (Lower Bound)	11 (Upper Bound)
7.276930	4	5%	3.62	4.16
		1%	4.94	5.58

Source: Author’s computation

From table 2 the F-statistics is greater than the upper bound at 1% level of significance. Thus, we reject the null hypothesis and conclude that there exists a long run relationship between balance of payment (BOP) and Exchange Rate (EXR) in Nigeria. Therefore, we estimate the parsimonious result of the relationships between BOP and the Exchange Rate in the country.

4.3 Autoregressive Distributed Lag (ARDL) Result

4.3.1. Short Run Parsimonious ARDL Result

The summary of Short Run Parsimonious ARDL result of the impact of selected macroeconomic variables on balance of payment in Nigeria is presented in table 3.

Table 3: Summary of Short Run Parsimonious ARDL Result
ARDL Model (2, 0, 3, 4, 1)

Dependent Variable D(BOP)				
Variables	Coefficient	Std. Error	t-statistics	Probability
D(BOP(-1))	0.232922***	0.161246	1.444513	0.1575
ECT(-1)	-0.737630***	0.174471	-4.227818	0.0002
R-squared = 0.339134; Adj R-Squared = 0.321273				

***[**] denotes significant of variable at 1% [5%] significance level respectively.

4.3.2 Long Run ARDL Result

The summary of Long Run ARDL result of the impact of Exchange Rate on Balance of Payment in Nigeria is presented in table 4

Table 4: Long Run ARDL Result

Dependent Variable BOP				
Variables	Coefficient	Std. Error	t-statistics	Probability
Constant	-11746.21***	5076.524	2.313829	0.0267
EXR	-27.42032***	32.49897	-0.843729	0.4046

***[**] denotes significant of variable at 1% [5%] significance level respectively.

Interpretation of Short Run Result

The result in table 4 shows the short run parsimonious result. The lag value of BOP is positively and insignificantly influencing its current value which suggests that an increase in the immediate past state of BOP will destabilize the present BOP in the country.

The coefficient of determination R-Square and its adjusted R-Square are 0.34 and 0.32 respectively. This shows a poorly fitted of the model and further suggests that about 34 % of the variations in BOP position is explained by changes in (exchange rate included in the model while the remaining 66% of the variations is captured by the error term. The coefficient of error correction term which measures the speed of adjustment to the long run equilibrium is appropriately signed and significant. Specifically, the coefficient of -0.737 implies that about 73.76% of the disequilibrium in the country's BOP is corrected every year. This further suggests that it takes one year and one month for any disequilibrium in BOP position to be corrected by the exchange rate.

Interpretation of Long Run Result.

The long run result in table 4 shows that exchange rate has a negative and insignificant impact on BOP position in Nigeria.

4.4: Discussion of Test of Hypothesis

Hypothesis 1

H₀: There is no statistical significant relationship between exchange rate and balance of payment in Nigeria.

From table 4 above, the probability value for exchange rate (EXR) is 0.4046 greater than 0.05. Since the p-value (EXR) is greater than 0.05, we accept H₀ and conclude that there is no statistical significant relationship between exchange rate and BOP in Nigeria.

4.5. Evaluation of Result based on Econometric Criteria (2nd order Test)

4.5.1 Breusch-Godfrey Serial LM Test for Auto- Correlation

The underlying assumption of autocorrelation is that the successive values of the random μ_t are temporally independent. The Breusch-Godfrey Serial Correlation statistics is used to test for the presence of autocorrelation of order q in the models.

Table5: Breusch-Godfrey tests

	F-Statistics	Probability
Breusch-Godfrey LM test for autocorrelation	0.771988	0.4703

From table 5 above, the probability value of B-Q statistics is greater than 0.05. Since the B-Q statistics is greater than 0.05, we reject the null hypothesis and therefore conclude that there exists no q order serial auto-correlation of stochastic errors terms in the model.

4.5.2 Test for Heteroscedasticity

The primary reason to test for heteroscedasticity after running for OLS is to detect violation of assumption OLS:5, which is one of the assumptions needed for the usual statistics accompanying OLS regression to be valid. The F – statistics can be used to verify this assumption, and the hypothesis is formulated as follow:

Hypothesis

H₀: (There is no heteroscedasticity, i.e. homoscedasticity)

H₁: (There is heteroscedasticity)

Decision Rule; Reject H₀ if the calculated F value is greater than the tabulated F value, otherwise accept H₀. The heteroscedasticity result is as presented in table 6:

Table 6: Breusch-Pagan-Godfrey Heteroskedasticity Test

F-statistic	0.422804	Probability	0.7378
Obs*R-squared	1.363944	Probability	0.7140

Following the above result, calculated F value = 0.422804 and its probability value = 0.7378. Therefore, since the calculated value of F is insignificant, we accept H₀ of homoscedasticity and conclude that the conditional variances of the error terms are equal. However, on the basis Observed R-Squared and Scaled explained SS, we conclude that the conditional variances of the terms are unequal.

4.5.3 Normality Test

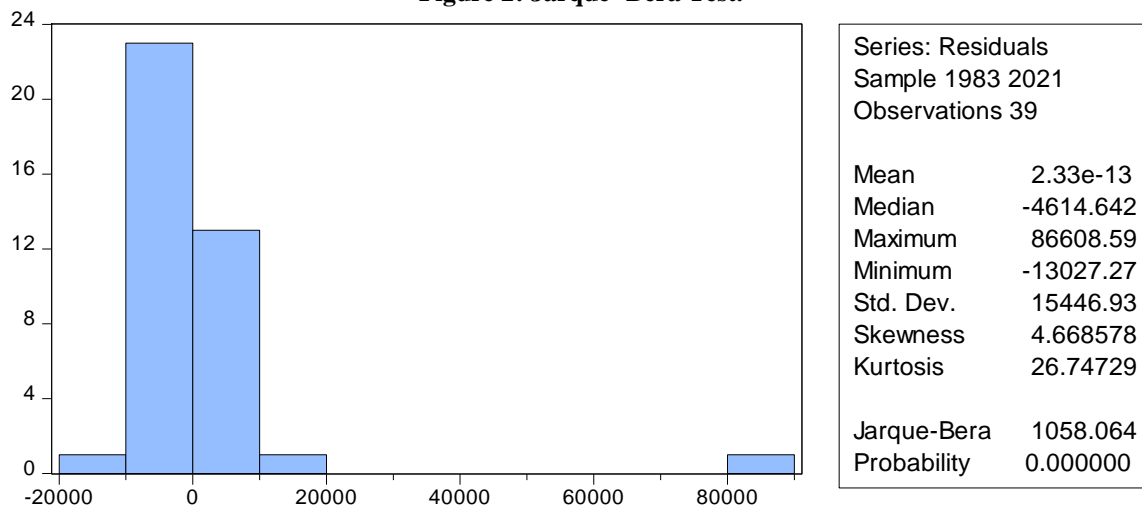
This test is to enable us determine whether the residual follows the normal distribution as postulated by classical OLS assumption. This is tested using the Jarque-Bera test. The hypothesis is formulated as follows:

H₀: $\mu = 0$ (Residual follow normal distribution)

H₁: $\mu \neq 0$ (Residual does not follow normal distribution)

The Jarque- Bera test result is presented in Figure 2 below:

Figure 2: Jarque- Bera Test.



Evidently, the null hypothesis cannot be rejected since the Jarque- Bera probability is 0.000000 (<0.05). Thus we reject H₀ and conclude that the residual did not follow normal distribution and that the assumption of normal distribution is hereby not satisfied.

4.5.4 Ramsey Reset Test

This test is used to test for model mis-specification. The hypothesis is formulated as follows:

H₀: Model is mis-specified

H₁: Model is not mis-specified

Table 7: Ramsey RESET Test

Ramsey RESET Test			
Equation: UNTITLED			
Specification: BOP BOP(-1) BOP(-2) EXR INF INF(-1) INF(-2) INF(-3)			
INTR			
INTR(-1) INTR(-2) INTR(-3) INTR(-4) MOS MOS(-1) C			
Omitted Variables: Squares of fitted values			
	Value	Df	Probability
t-statistic	2.013747	34	0.0520
F-statistic	4.055177	(1, 34)	0.0520

Evidently, the null hypothesis is inconclusive since the probability value of F-statistic is 0.0520 (= 0.05).

4.5.5 Multicollinearity Test: Multicollinearity test is used here to ascertain the violation of the assumption of randomness of the classical linear regression model. In carrying out the test, we made use of the correlation matrix table. The result is shown in table 7 below.

Decision Rule:

If the pair-wise or zero-order correlation coefficient between two explanatory variables is high, say in excess of 0.8, then multicollinearity is a serious problem (Gujarati and Sangeetha, 2007).

Table 7: Correlation Matrix. Series: EXR, INF, INTR and MOS

EXR	
EXR	1.000000

From the result in table 7, the exchange rate a partial correlation in the correlation matrix is 1.000000 and by implication it is greater than 0.8. Thus, there is no multicollinearity in the model.

V. CONCLUSION

Base on the empirical results in chapter 4, the summary of the findings are itemized as follows: 1. The ARDL Bound co-integration result shows evidence of long run positive and significant relationship between BOP and exchange rate on balance of payment in Nigeria.

5.1 POLICY RECOMMENDATION

The study recommends that the policy makers should take keen interest on how best to improve the value of Nigeria's export to the world, this will help bring to equilibrium the exchange rates that play an important role in determining the balance of payments.

The government needs to increase marketing of its exports, create awareness among local entrepreneurs of existing export market that need to be exploited while giving incentives to local industries producing for export as well as those companies that assemble locally which help curb demand for imports.

REFERENCES

- [1]. Central Bank of Nigeria Statistical Buletin (CBNSB) (2022)."Globalization and National Economic Development." Central Bank Annual Report, December.
- [2]. Central Bank of Nigeria Statistical Buletin (CBNSB) (2021)."Globalization and National Economic Development." Central Bank Annual Report, December.
- [3]. Dalimus, A., Obunike, J. & Muhammed, C. (2018). Effect of nominal exchange rate on Nigeria's balance of payment: 1986 – 2016. Benue Journal of Social Sciences. 4 (1), 34 – 52
- [4]. Ezirim, C. B., Edith A.A. & Michael I. M. (2012). Autoregressive Distributed Lag Analysis of Interdependencies between Inflation and Exchange Rates in Sub-Saharan Nigeria. The IABPAD Conference Proceedings Dallas, Texas, Vol. 9, No. 2, April 19-22, 2012, pp. 1082-1093.
- [5]. Grigorianm, D., Khachatryan, A., & Sargsyan, G. (2004). Exchange Rate, Money and Wages: What is Driving Prices in Armenia? IMF Working Paper, WPS 129.
- [6]. Imoughele, L. & Ismaila, M. (2015), Monetary policy and balance of payments stability in Nigeria, International Journal of Academic Research in Public Policy and Governance, 2(1), 1 15. Inflation and Exchange Rate Competitiveness. International Journal of Finance and Economics. Vol. 8: 167-184.

- [7]. Investopedia Team, peter L. and Ariel, K. (2021) “Argentina Just reinstated foreign currency restrictions”. The washing post. Retrieved 8 September 2019.
- [8]. Investopedia Team, Kenton, & Boyle (2021) www.investopedia.com/terms/b/bop.asp
- [9]. Iyoboyi, E. & Muftau, O. (2014). Impact of exchange rate depreciation on balance of payments: Emperical evidence from nigeria. *Cogent economics and finance*. 2:923323. Online: <http://dx.doi.org/10.1080/23322039.2014.923323>
- [10]. James, C. & Gordon, S. (2021) “Triennial Central Bank Survey”, Foreign (other countries) exchange turnover in April 2013: preliminary global result – monetary and economic department (PDF) Bis.org. Retrieved 23, December 2017.
- [11]. Kamin, S.B., & Klau, D. M. (2003). A Multi-Country Comparison of the Linkages between Inflation and Exchange Rate Competitiveness. *International Journal of Finance and Economics*, Vol. 8: 167-184
- [12]. Kandil, M., & Greene, J. (2002). The Impact of Cyclical Factors on the U.S. Balance of Payments. IMF Working Paper, WP/02/45.106 Central Bank of Nigeria Economic and Financial Review June 2019
- [13]. Keynes, J. M. (1971). A treatise on money: The applied theory of money. Vol.6 of The collected writings of John Maynard Keynes. London: Macmillan (for the Royal Economic Society).
- [14]. Koutsoyiannis, A. (1977). “Theory of Econometrics”, London: The Macmillan Press.
- [15]. Lamsso, M.S. & Masoomzadeh, S. (2017). Study of impact of exchange rate on tourism balance of payment in Countries with top tourist attractions (vector error correction approach). *International Journal of Tourism and Hospitality Review*. 4 (1), 10 – 20.
- [16]. Limbore, N.V. & Moore, S. P. (2019). Impact of exchange rate on balance of payment of India. *Review of Research*. 8 (7), 1-5
- [17]. Linear and Nonlinear Causal Linkages Pakistan Institute of Development Economics Islamabad (PIDE) Working Papers; No. 63.
- [18]. National Bureau of Economic Research Working Paper no.494. June. 1986. Speculative attack and the external constraint in a maximizing model of the balance of payments. *Canadian Journal of Economics* 19(February): 1-22.
- [19]. Nwanekezie, S. & Onyiro, H. (2018). Exchange rate volatility and the Nigerian balance of payment (1981 – 2016). Munich Personal Repec Archive, MPRA Paper No. 90562.
- [20]. Nwanosike, D.U., Uzochina, B., Ebenyi, G.D. & Ishiwu, V. (2017). Analysis of balance of payment trend in Nigeria: A test of Marshall-Lerner hypothesis. *Saudi Journal of Business and Management Studies*. 2 (5), 468-474
- [21]. Olanipekun, D.B. & Ogumsola, A.J. (2017). Balance of payment crises in Nigeria: The role of exchange rate. *International Journal of Economics, Commerce and Management*. 5 (5), 119 – 140.
- [22]. Osisanwo, G. B., Maku, O. E., Ajike, E. O., & Ekwunwu, T. K. (2015), Growth effect of balance of payments and monetary policy in Nigeria (1980-2013): A time series analysis, *Global Journal of Management and Business Research: A Administration and Management*, 15(8), 37-46.
- [23]. Pesaran, M.H. & Pesaran B. (1997). Working with Microsoft 4.0: interactive Econometric Analysis. Oxford, Oxford University Press
- [24]. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds Testing Approaches to the Analysis of Level Relationships. *Journal of Applied Econometrics*, 16(3), 289-326.
- [25]. Relationship in OECD Countries: Analysis of Panel Data. Anadolu University Review Committee for Balance of Payments Statistics (1965). The balance of payments statistics of the United States: A review and appraisal. Washington, D.C.: U.S. Government Printing Office. *Review of Economic Studies* 42(July):327-46.
- [26]. Tang, T.C. (2003). Japanese aggregate import demand function: Reassessment from the ‘Bound’ testing approuche; japan and the world economy. 15:419-436.

Ukangwa, Jane Uchechi, et. al. “Analysis of the Impact of Exchange Rate on Balance Of Payments in Nigeria.” *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, 27(07), 2022, pp.46-55