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Asymmetric Impact of Exchange Rate on Balance of Payment in Nigeria

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ABSTRACT

Maintaining a stable exchange rate is key to attaining macroeconomic objectives for any emerging economy like Nigeria. Thus, an unstable exchange rate may lead to economic instability and uncertainty in the investment climate of an economy like Nigeria. Over time Nigeria has been faced with unstable exchange rates. persistent economic challenges and an unfavourable balance of payments. In the pursuit of these macroeconomic goals, Nigeria has implemented various exchange rate regimes, including fixed, floating, and a unified exchange rate system. However, these goals remain a challenge to the economy. It is against this backdrop that this study employed the Nonlinear Autoregressive Distributed Lag estimation technique to analyze the asymmetric impact of exchange rate fluctuations on Nigeria's balance of payments. Additionally, it considers the impact of control variables such as real interest rates, gross fixed capital formation, trade openness, trade policies, financial deepening, natural resources, and trade balance. Findings from this study revealed that the exchange rate has an asymmetric impact on the balance of payments in Nigeria. Other control variables were statistically insignificant but contributed positively to the balance of payment in Nigeria. Therefore, the research suggested that to improve the balance of payments of the country, Nigeria's monetary authorities; the Central Bank of Nigeria (CBN), should implement exchange rate policies that will promote domestic investment and encourage export activities. Interest rate policies that would encourage domestic investments are necessary. This can be achieved through reducing the monetary policy rate which is a driver of banks' interest rate. This will further encourage loanable funds for investment, hence a favourable balance of payment in Nigeria. Furthermore, the Federal Government through the Ministry of Petroleum and Natural Resources should leverage international oil prices to enhance export activities and strengthen the balance of payments.

INTRODUCTION

The balance of payments (BOP) of a nation provides a statistical repository that shows a country's economic relationships globally. BOP is influenced by broader macroeconomic factors such as inflaion Gross Domestic Product (GDP) and exchange rates. Global economies are interlinked through international trade and connections, creating a symbiotic interdependence that necessitates exchange of commodities between countries. The diversity of currencies between countries, makes exchange rate become a crucial mechanism for facilitating transaction transactions. Exchange rate serve as a bridge that connects different monetary systems, enabling commerce between countries. Oladipupo & Ogbenovo (2011) emphasized the significant role of exchange rate in international diplomacy, as they facilitate the flow of goods and services by determining relative currencies values.

Maintaining equilibrium in the BOP is a primary goal of exchange rate policy, although this objective is intertwined with the broader economic context. Trade imbalances, often linked to import expenditures, do not always indicate excessive imports over exports. Instead, they may result from the need to complement domestic goods with imports that are not available locally. Thus, a standardized exchange rate framework is essential for smooth global trade relationships. The linkage between the exchange rate and BOP is further influenced by inflation, as price fluctuations impact exports and imports. For example, a lower exchange rate can boost exports, while a higher rate may encourage imports (Usman & Bukar, 2020). The BOP evaluates a country's trading position and overall economic condition, making it a crucial external performance measure. Exchange rates and BOP correlate not just with trade but also with foreign investment and financial inflows, both of which are essential for long-term economic growth. (Agundu *et al.*, 2013). In Nigeria, efforts to manage exchange rate instability have been complicated by economic disparities, particularly the overvaluation of the naira. This overvaluation has hindered export promotion and economic diversification, as Nigeria's economy remains heavily reliant on oil exports while neglecting the agricultural and industrial sectors.

Currency fluctuations in Nigeria, especially with major global currencies, underscore the challenges of an oil-centric economy. Government interventions aimed at controlling currency appreciation have been insufficient to achieve long-term stability, resulting in erratic exchange

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rates that adversely affect the BOP. However, Nigeria has implemented various exchange rate regimes, including fixed, floating, and a unified exchange rate system since the 1960s, as it aims to maintain exchange rate stability essential for achieving a favourable balance of payments and fostering economic growth. Despite various policy measures, exchange rate volatility persists, posing a significant challenge to Nigeria's economic prospects. This situation highlights the need for a realistic exchange rate framework that reflects the underlying economic conditions.

Nigeria's foreign exchange market is deeply influenced by supply and demand dynamics, as overreliance on crude oil makes the country vulnerable to external shocks such as oil theft and volatility of prices of crude oil. This vulnerability reduces foreign reserves, exacerbating exchange rate uncertainties and weakening the BOP. Moreover, strict regulations and complex procedures related to foreign remittances further limit the foreign exchange supply, leading to issues like exchange rate misalignment and arbitrage. These challenges result in high import costs and the potential for a current account deficit.

High exchange rates can also cause imbalances in the capital account by putting pressure on foreign reserves and raising interest rates. These complexities have led to a fluctuating BOP in Nigeria, alternating between surplus and deficit since the 1980s. The complex relationship between the foreign exchange rates and Nigeria's larger macroeconomic environment is shown in the BOP's continuous volatility.

In light of these complications, this study examined, the dynamic relationship between the dollar exchange rate and BOP through an analysis of Nigeria's current, capital, and financial account balances. The relationship between exchange rate and BOP is still complicated and poorly understood despite a plethora of empirical data, necessitating more research. Therefore, by offering information that can guide policy choices and support the development of a more resilient Nigerian economy in the face of international economic crises, the inquiry added to our understanding.

The subsequent sections of the article explored theoretical and empirical literature, detailed methodology, presented empirical findings, and offered conclusions with implications for policy and future research. Through a more thorough analysis, this research offered valuable insights that can guide policy and foster economic stability in a globally interconnected environment.

LITERATURE REVIEW

Conceptual Framework

Exchange rates, which show how much one country's currency is worth in relation to another, are crucial in international trade and economic exchanges. Imoisi (2012) defines it as the relative cost between two currencies, whereas Lothian (2001) defines it as a country's currency worth on the international market. There are essentially two types of exchange rates: nominal and real. Nominal rates represent the market value of currencies, whereas real rates account for inflation and display the purchasing power of products between two countries.

Exchange rates are vital because they impact the cost of imports and exports, influencing a nation's economy. A depreciating currency, like the naira, makes imports more expensive and exports cheaper, potentially boosting export sales but also leading to higher import costs. Conversely, a stronger currency can harm export competitiveness. Exchange rate fluctuations affect various economic factors, including interest rates, inflation, and employment levels, making exchange rate management crucial for economic stability.

Balance of payments (BOP) which is record of a nation's economic transactions with other countries is significantly influenced by the exchange rate. Effective exchange rate management can stabilize prices and impact employment, investment, and wealth distribution. In Nigeria, the naira's devaluation in the 1980s aimed to address BOP deficits but faced challenges owing to the country's reliance on agriculture and crude oil, highlighting the complexity of using exchange rate adjustments as a policy tool. The BOP records all transactions between residents and non-residents, including trade, financial claims, and transfers and overall interactions with the global market (CBN, 2016; Ocheuje, 2021).

Empirical Review

The importance of effective exchange rate management in promoting economic growth cannot be overstated, as it influences key financial indicators and a nation's overall economic health. Thus, ongoing research remains critical for understanding and improving economic outcomes. Agu *et al.* (2023) used the Autoregressive Distributed Lagged model (ARDL) to examine how non-oil exports affected Nigeria's BOP between 1981 and 2020. They discovered that Nigeria's BOP was positively impacted by non-oil exports, pointing to a possible route towards economic stability. Though the effect was not statistically significant, the exchange rate did have a negative impact on the BOP. In light of Nigeria's historical reliance on non-oil exports prior to the discovery of crude oil, the authors suggested a move towards non-oil sectors in order to generate a surplus in the BOP.

Using the ARDL estimate technique, Yusuf *et al.* (2023) examined the impact of currency rate depreciation on Nigeria's BOP from 1981 to 2021. They demonstrated how exchange rate depreciation significantly affects BOP over the short and long terms, validating the Marshall-Lerner condition, which postulates that, in some circumstances, exchange rate depreciation might increase BOP. They promoted the use of import substitution as a means of boosting domestic manufacturing and raising the BOP.

Conversely, Pamogho *et al.* (2023) utilized the Ordinary Least Squares method, Granger Causality, and GARCH models to analyse the relationship between BOP disequilibrium and economic growth in Nigeria. They found that while BOP did not significantly impact growth, exchange rate fluctuations has significant negative effect. This suggests that addressing structural BOP issues and implementing effective exchange rate management could positively influence Nigeria's economic growth. Similarly, Patrick (2023) found that the exchange rate's impact on Nigeria's BOP was weak and negative.

Further analysis by Chigozie & Uko (2022) using an Indirect Least Squares estimation method revealed negative relationships between exchange rate and BOP in Nigeria. Additionally, Mesagan *et al.* (2022) used NARDL framework to analyze the impact of exchange rate asymmetries on trade and output growth in eight large African countries. They found that both currency appreciation and depreciation had complex effects on trade and output, with generally negative long-term impacts on trade balance but short-term positive effects from depreciation.

Maku *et al.* (2023) used Vector Error Correction Mechanism (VECM) to examine the connection between macroeconomic fundamentals and currency rates in a study that was specifically focused on Nigeria. They concluded that the real exchange rate's depreciation was a major factor in the short- and long-term downturn in the performance of the national economy. This emphasises how crucial it is to handle exchange rates and other economic fundamentals carefully to foster growth.

Using the ARDL technique, Nguyen *et al.* (2022) examined how the exchange rate affected Vietnam's BOP and discovered a sizable positive influence of the foreign exchange rate on the BOP. Using a similar technique of analysis, Pablo *et al.* (2023) looked at how exchange rate variations affected inflation in the Philippines and found that they had an impact on actual inflation rates. This suggests that the BOP has a unidirectional impact on the exchange rate, inflation, interest rates, and GDP growth. Similarly, Oriavwote (2022), evaluated the influence of the real effective exchange rate on Nigeria's BOP from 1996 to 2021 using the Error Correction framework and discovered a long-term, positive, and significant effect.

Nwachukwu (2021) employed the VECM to examine the effects of exchange rate fluctuations on Nigeria's BOP. The findings indicated a positive link between the two variables. Per the study, promoting political and industrial stability would be beneficial for boosting domestic investment and further stabilising the BOP. Using s similar technique, Agus (2020) applied a VECM to study Indonesia's BOP, findings from their study revealed that exchange rates, national income, interest rates, and inflation have a significant influence on BOP in the long term, with exchange rates and inflation having negative effects. Udayanga (2019) analyzed Sri Lanka's BOP determinants and found that money supply and exchange rate were the most negatively influential, while reserve assets and and managing the exchange rate to prevent future BOP deficits. export income had the most positive effects. The study recommended boosting export income

Despite these varied findings, the literature shows no consensus on effectiveness of exchange rate policies on BOP. Some studies, such as those by Yusuf *et al.* (2023) and Mesagan *et al.* (2022), found positive impact of exchange rate depreciation, while others, like Maku *et al.* (2023), highlighted negative impacts on economic performance. These inconsistencies underscore the need for further research, particularly in the Nigerian context, where exchange rate crises have been a recurring challenge. Revisiting these studies with updated data and incorporating relevant control variables could enhance understanding and guide more effective economic policy interventions.

The paper is grounded in the BOP theory developed by Hume, Alexander, Mundell and Johnson in 1952, 1968, and 1975, respectively. This theory is based on monetary approach to BOP, which posited that BOP is primarily a monetary phenomenon. According to this perspective, changes in a nation's money supply are central to understanding and analyzing its BOP (Gureech, 2014; Udayanga, 2019).

The theory was later modified to stress the importance of exchange rates as a key monetary factor influencing the BOP. In the context of Nigeria, the economy has experienced significant fluctuations in exchange rates, leading to various macroeconomic challenges, including BOP disequilibrium, inflationary pressures, and economic growth crises. This invesigation builds on the monetary approach by exploring the asymmetric effects of exchange rate fluctuations on Nigeria's BOP, arguing that these fluctuations are a critical factor in understanding the country's economic dynamics.

MATERIALS AND METHODS

Model Specification

Based on the above framework, Udayanga (2019) specified a multiple regression of the form which shows the determinants of the balance of payment:

$BOP_t=\beta_0+\beta_1BOP_{(t-1)}+\beta_2EXR_t+\beta_3EGR_t+\beta_4IR+\beta_5RA_t+\beta_6EX_t+\beta_7IM_t+\beta_8MS_t+\varepsilon_t$..1

Where:

BOP_t = Balance of payment, BOP_{t-1}= pass changes in the balance of payment, MS = Money Supply, EGR = Economic Growth, IR = Inflation Rate, RA = Reserve Assets, EX = Export Income, IM = Import Expenditure, EXR = Exchange Rate, t = time variant.

To reflect the gap found in the current research, the model in equation 1 was modified to include some more simplified variables that are free from the possibility of multicollinearity and serial correlation. As a result, the following is the present model's stochastic form:

$BOP_t=\beta_0+\beta_1BOP_{(t-1)}+\beta_2EXR_t+\beta_3IR+\beta_4GFC_t+\beta_5TOP_t+\beta_6TRP_t+\beta_7FID_t+\beta_8NAR_t+\beta_9TBL_t+\varepsilon_t$...............................2

The model in equation 2 includes control variables such as Real Interest Rate (IR), gross fixed capital formation (GFC), Trade Openness (TOP), Trade Policies (TRP), Financial Deepening (FID), Natural Resources (NAR), Trade Balance (TBL). IR is to measure how the difference in interest rate can affect capital flows. High interest rates may attract foreign investment and discourage domestic investment, hence leading to capital inflow and potentially a surplus in the capital and finance account. The influence of GFC which represents investment in fixed assets and capital goods has a multifaceted influence on the balance of payments (BOP) by affecting various components of the BOP. TOP was added to the model to investigate the significance of the Nigerian economy being open to foreign trade. It is considered that open economies expand more quickly than relatively closed ones. TRP such as tariffs or quotas can impact positively on the BOP. A trade policy that encourages import substitution can encourage export over import, which may lead to a favourable BOP, hence, a balance of payment. Due to the availability of data, the paper proxied trade policy by tariff. FID accounts for the increased provision of financial services with a wider choice of financial instruments and institutions. It shows how development of Nigeria's financial sector, which encompasses the banking system, stock markets, bond markets, insurance companies, and other financial intermediaries. FID can have a profound effect on BOP by enhancing export capacity, attracting foreign investment, increasing access to credit, and stabilizing the financial system. The availability and price of natural resources can impact a country's trade balance, especially if it is a significant exporter or importer of these resources. In this paper, natural resources (NAR) were proxied by crude oil prices. The paper recognizes the significance of oil resources as the mainstay of Nigeria. Therefore, its significance on the balance of payment cannot be over-emphasized. The TBL is a crucial component of the current account. It reflects the difference between exports and imports of goods and services. While trade surpluses have a positive impact on the BOP, deficits have a negative impact. In equation 2, t is time-variant and ε is the error term normally distributed, without serial correlation and heteroscedasticity.

On the assumption that the dependent variables may respond both positively and negatively to the independent variable, the paper employed the NARDL estimation technique as used by Mesagan *et al.* (2022).

The NARDL Model Specification

Let the BOP_t model be the balance of payment at time t, and X_{it} represent the independent variable (EXR,) the NARDL model is formulated as:

$$\Delta BOP_t = \alpha + \sum^{p}_{(i=1)} \delta_i \Delta BOP_{(t=i)} + \sum^{p}_{(i=1)} \beta_i^{+} \Delta X_{it}^{+} + \sum^{p}_{(i=1)} \beta_i^{-} \Delta X_{it}^{-} + \varepsilon_t \quad \text{......3}$$

Where:

BOP_t is the Balance of Payment at time t and X_{it} represents the independent variable, Δ is the first difference, X_{it}^{+} and X_{it}^{-} are both positive and negative changes in X_i, β_i^{+} and β_i^{-} are both the short-run coefficients for the positive and negative changes in the independent variable. δ_i are the coefficients for the lagged dependent variable and ε_t.

$$BOP_t = \phi_0 + \sum_{i=1}^{p} \phi_i^{+} X_{it}^{+} + \sum_{i=1}^{p} \phi_i^{-} X_{it}^{-} + \mu_t \quad \text{......4}$$

Where:

Φ_i^{+} and Φ_i^{-} are the long-run coefficient for the positive and negative changes in the independent variable on the dependent variable.

RESULTS AND DISCUSSION

Table 1: Descriptive Statistics

	LNBOP	LNEXR	RINR	LNGFC	LNTOP	LNTRP	FID	LNNAR	LNTBL
Mean	2.263	4.006	1.389	29.712	16.872	2.831	14.590	3.636	27.126
Median	2.107	4.744	2.046	29.701	16.744	2.950	12.899	3.341	27.057
Maximum	3.827	5.066	18.180	29.989	18.514	4.514	23.137	4.761	30.228
Minimum	0.086	1.512	-31.453	29.431	15.180	2.234	8.464	2.765	23.559
Std. Dev.	1.145	1.181	11.172	0.136	1.056	0.525	4.641	0.725	1.814
Skewness	-0.095	-0.736	-0.939	0.189	0.090	1.036	0.706	0.406	-0.125
Kurtosis	1.672	1.995	4.118	2.817	1.735	4.949	2.092	1.529	1.946
Jarque-Bera	1.949	3.438	5.173	0.192	1.769	8.763	3.052	3.059	1.272
Probability	0.377	0.179	0.075	0.909	0.413	0.013	0.217	0.217	0.530
Observations	41	41	41	41	41	41	41	41	41

Source: Author's Computation using Eviews 10

The paper estimated standard deviation to measure the variability of each variable from their average values. The interest rate had the highest standard deviation, indicating the most variability, while gross fixed capital formation had the lowest. The main independent variable, the exchange rate, had a standard deviation of 1.18. Most variables, except for interest rate and financial deepening, showed low variability, with standard deviations ranging between 1 and 2, suggesting that data points were clustered around the mean. However, the interest rate and financial deepening showed higher variability, with data points more spread out from their mean.

The skewness results indicated the degree of asymmetry around the average value. Positive skewness values suggested that the distributions were skewed to the right, while negative skewness indicated a left-tailed distribution. The kurtosis values revealed that all variables, except for interest rate and trade policies, were platykurtic, meaning they had light-tailed distributions with fewer extreme values. In contrast, interest rate and trade policies were leptokurtic, with heavy-tailed distributions, indicating more extreme values. Finally, the Jarque-Bera test showed that all variables, except for trade policy, were normally distributed.

Table 2: Augmented Dickey Fuller (ADF) Unit Root Test

Variables	At Level	Critical Values	Prob	At First Diff	Critical values	Prob	Remarks
BOP	-0.438	-2.976	0.889	-6.526	-2.976	0.000	I(1)
EXR	-1.265	-3.521	0.883	-5.819	-3.524	0.000	I(1)
INR	-5.615	-3.520	0.000	-13.145	-3.520	0.000	I(0)
GFC	-2.825	-2.937	0.064	-4.957	-2.937	0.000	I(1)
TOP	-0.338	-2.937	0.978	-3.595	-2.937	0.010	I(1)
TRP	-2.529	-2.951	0.118	-8.686	-2.954	0.000	I(1)
FID	-2.226	-3.521	0.463	-5.863	-3.524	0.000	I(1)
NAR	-0.810	-2.933	0.806	-4.997	-2.937	0.000	I(1)
TBL	-3.152	-3.030	0.040	-1.388	-3.120	0.555	I(0)

Source: Author's Computation using Eviews 10

The results of ADF tests in Table 2 showed that the variables are integrated of different order of I(0) and I(1) without I(2). This is evidenced as the probability values of ADF are less than 0.05 (5%). The order of integration, however justified the use of NARDL which is an upshoot of ARDL model.

Table 3: Lag Order Selection Criteria
Endogenous variables: LNEXR RINR LNGFC LNTOP LNTRP FID LNNAR BOP

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-456.598	NA	233.828	28.157	28.520	28.280
1	-330.432	183.514*	6.050*	24.389*	27.655*	25.488*
2	-267.253	61.264	13.594	24.440	30.607	26.514

Source: Author's Computation using Eviews 10

AIC, SC, and HQ are most often used as model selection criteria. Lag 1 is the optimal lag length based on all the given parameters. The Table uses an asterisk (*) to indicate which fit is best in each category. As a result, Table 3's results indicated that the optimal lag time for the model containing the designated endogenous variables is 1.

Table 4: ARDL Bounds Test for Cointegration

F-Bounds Test Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	8.444963	10%	1.8	2.8
K	9	5%	2.04	2.08
		2.5%	2.24	3.35
		1%	2.5	3.68

Source: Author's Computation using Eviews 10

From Table 4, the F-statistic which is 8.444963 is higher than the upper and lower bound limits which are 2.04 and 2.08 at 5% critical level of significance. This suggests a long run equilibrium relationship among the variables employed in the NARDL model.

Table 5: Wald Test for Asymmetric Effect
Equation: NARDL05

Test Statistic	Value	Df	Probability
t-statistic	2.164	4	0.016
F-statistic	20.435	(1, 4)	0.000
Chi-square	20.435	1	0.000

Null Hypothesis: C(2)=C(3)
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2) - C(3)	20.511	9.479

Source: Author's Computation using Eviews 10

In testing the null hypothesis of no asymmetry in the relationship between the variables. This means that the positive and negative changes in the independent variable have the same effect on the dependent variable. Against the alternative hypothesis that there is an asymmetry in the relationship between the variables. That is, the positive and negative changes in the independent variable have different effects on the dependent variable. By using the Wald test of asymmetry, the result in Table 5 shows that the null hypothesis is rejected because all test statistics' p-values (t, F, and Chi-square) are less than their critical values at 0.05. As a result, we can conclude that positive and negative changes in the exchange rate have different effects on Nigeria's balance of payments. Meaning, that the exchange rate overtime has an asymmetric impact on the balance of payment in the Nigerian context.

Table 6: NARDL Short-Run Result
Dependent Variable: D(LNBOP)
Selected Model: ARDL(1, 1, 1, 1, 1, 1, 1, 1, 1, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEXR_POS)	1.938	0.511	3.791	0.019
D(LNEXR_NEG)	9.130	5.448	1.676	0.169
D(RINR)	0.022	0.007	2.990	0.040
D(LNGFC)	0.075	0.400	0.186	0.861
D(LNTOP)	-0.891	0.221	-4.031	0.016
D(LNTRP)	0.091	0.157	0.578	0.594
D(FID)	0.042	0.033	1.298	0.264
D(LNNAR)	3.879	0.524	7.409	0.002
D(LNTBL)	0.177	0.100	1.776	0.151
CointEq(-1)*	-0.511	0.244	-4.139	0.014
R-squared	0.888	Durbin-Watson stat		2.754
Adjusted R-squared	0.817	F-statistic		5.357
S.E. of regression	0.236	Prob(F-statistic)		0.002

Source: Author's Computation using Eviews 10

The result in Table 6 displays short-term outcomes of the NARDL model, where BOP is dependent variable. The model that has been chosen is the ARDL (1, 1, 1, 1, 1, 1, 1, 1, 1). The positive change in the exchange rate has probability of 0.019 and coefficient of 1.938, according to the data, showing positive impact on BOP which is statistically significant at 1%. This research outcome is in conformity with Yusuf *et al.* (2023), Oriavwote (2022), Nguyen *et al.* (2022), and Nwachukwu (2021) findings. Consequently, a positive increase in the dollar-to-naira exchange rate will lead to a 1.94 percent gain in balance of payments in Nigeria's. Furthermore, a negative change in the exchange rate has a 9.130 coefficient and a probability value of 0.169. However, Nigeria's balance of payments is still unaffected by the negative shift in the dollar to naira exchange rate. On the other hand, the exchange rate in Nigeria increases by around 9.13 percent for every 1% decline. This conclusion contradicts the findings of Agu *et al.* (2023) and Chigozie & Uko (2022), who proposed a negative association between exchange rate and BOP. However, the findings align with the views of Agus (2020) and Oriavwote (2022) that exchange rate significantly influenced the BOP.

The change in the real interest rate has an estimated coefficient of 0.022, indicating a substantial and positive influence with a p-value of 0.040, according to the estimated coefficients of other control variables. This corresponds to Agus (2020). The change in capital formation is expected to have a coefficient of 0.075. With p-value of 0.861, the estimate is not statistically significant. With p-value of 0.016, the change in terms of trade is significantly negative, as indicated by the coefficient of -0.891. In other words, the Nigerian balance of payments decreases by 0.89 percent for every 1% increase in terms of trade. The coefficient for the trade policy change is 0.091, and the p-value is 0.594, indicating that it is not statistically significant. The balance of payments in Nigeria will presumably rise by 0.09 percent when trade regulations such as tariffs are increased. The economy's shift in financial deepening has a coefficient of 0.042 and a probability value of 0.264 which indicates that the estimate is not statistically significant. However, the balance of payments in Nigeria increased by around 0.04 percent for every 1% increase in financial deepening. Using an oil price as proxy, the estimated coefficient of the change in natural resources has a substantial positive impact with a probability value of 0.002 and an estimated coefficient of 3.879. This finding highlights the importance of crude oil, which is the mainstay of the Nigerian economy and to the country's balance of payments. Despite not being statistically significant, the estimated coefficient of trade balance made a 0.18 percent contribution to Nigeria's balance of payments. The error correction term is significant and appropriately signed, to sum up. Based on a substantial p-value of 0.014 and a coefficient of -0.511, the model suggested a robust return to equilibrium.

88.8% of the variance in the balance of payments is explained by the variables in the model, according to the summary statistics, which show an R-squared value of 0.888. The F-statistic of 5.357 with a probability of 0.002 indicates that the overall model is statistically significant. The Durbin-Watson statistic value of 2.754 provides additional proof that the regression model does not contain autocorrelation.

Table 7: Diagnostic Test

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	1.395	Prob. F (2,8)	0.302
Obs*R-squared	6.205	Prob. Chi-Square (2)	0.045
Breusch-Pagan-Godfrey Heteroskedasticity Test			
F-statistic	0.591	Prob. F(13,10	0.815
Obs*R-squared	10.433	Prob. Chi-Square (13	0.658
Jarque-Bera Normality Test			
Jarque-Bera Statistic	1.021	Prob.	0.600

Source: Author's Computation using Eviews 10

Table 7 presents diagnostic tests on residual of the estimated model. The test is aimed at examining the reliability of the model estimated. The test result demonstrated the absence of serial correlation of the second order and heteroskedasticity among error components. The paper also demonstrated that error terms are distributed regularly. This is demonstrated by the finding that the probability values for Jarque-Bera Normality Test is higher than 0.05 (5%).

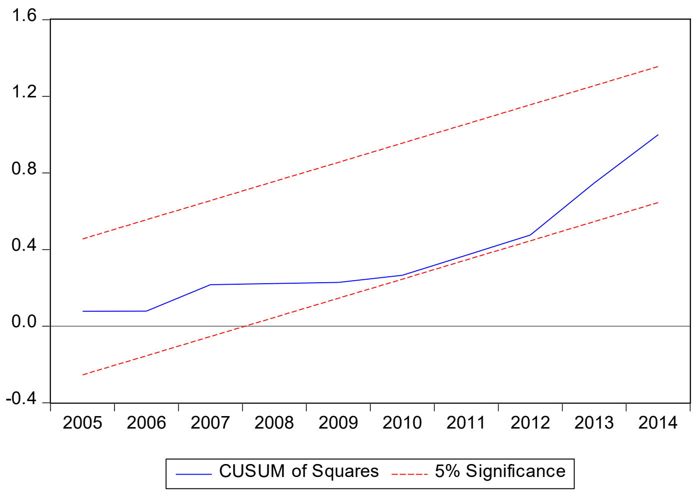

Figure 1: Stability Test
Source: Author's Computation using Eviews 10

The recursive estimate test was used to determine any structural weaknesses in the balance of payment model. It is also necessary to determine the stability of the calculated model. The plot of the cumulative sum of squares in Figure 1 shows that, at the 5% significant level, there may not be any significant structural cracks in the model. This provided additional evidence that the model's parameters hold steady over time.

CONCLUSION

Exchange rate is a crucial macroeconomic variable that significantly impacts the growth and development of economies, especially in Nigeria. Despite various exchange rate policies, Nigeria continues to face challenges with exchange rate fluctuations, which affect the broader macroeconomic environment, including the BOP. The BOP is particularly important for an emerging economy like Nigeria, given its economic interactions with other countries. As Nigeria grapples with exchange rate crises, inflationary pressures, and economic instability, the paper examined the asymmetric effect of exchange rate on BOP using series from 1981 to 2022.

In addition, the investigation also considered other control variables such as real interest rates, gross fixed capital formation, trade openness, trade policy, financial deepening, natural resources, and trade balance, using the NARDL estimation technique. Wald test confirmed existence of asymmetric relationship, indicating that positive and negative changes in exchange rates affect the balance of payments diffeently.

The research findings revealed that, while negative changes in exchange rates, gross fixed capital formation, trade policy, financial deepening, and trade balance are not significant in the short run, they contribute positively to

BOP. Positive changes in exchange rate, real interest rates, and natural resources significantly and positively influence the balance of payments, whereas trade openness has a significant negative impact. Results showed that positive exchange rate and other control variables have positive but insignificant impact on BOP, while negative exchange rate and real interest rate have negative and insignificant impact in the long run.

Diagnostic tests confirmed the reliability of the model, with no serial correlation or heteroskedasticity, and normally distributed error terms. The paper concluded that the exchange rate has an asymmetric impact on Nigeria's BOP, with a positive exchange rate contributing significantly in the short run. It highlights real interest rates, trade openness, and natural resources as significant drivers of the balance of payments.

Recommendations

The paper recommended that the Central Bank of Nigeria (CBN) implement exchange rate policies that promote domestic investment and export activities to improve BOP. Additionally, interest rate policies should encourage domestic activities and investments favourable to CBN, possibly by reducing the monetary policy rate to increase loanable funds. Furthermore, the Federal government through the Ministry of Petroleum and Natural Resources should leverage international oil prices to enhance export activities and strengthen the balance of payments.

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