EFFECT OF EXCHANGE RATE FLUCTUATION AND ECONOMIC GROWTH IN NIGERIA: 2001 - 2022

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Abstract
This research work examined the effect of exchange rate fluctuation on the economic growth in Nigeria. In specific term, the effect of exchange rate fluctuation on nominal GDP, inflation, and balance of payment was ascertained. The study employed Ordinary Least Square (OLS) regression and the Granger Causality test. The ordinary least square regression method was used to examine the nature of the relationship between the independent and dependent variables. On the other hand, the Granger Causality test examines the effect of one variable on another. This study used secondary time series data from 2001 to 2022. Data on exchange rate, inflation rate, balance of payment, and real gross domestic product were sourced variables have significant impact on each other. However, inflation rate is not impacted by exchange rate fluctuations in Nigeria. The monetary authority should adopt exchange rate policies that regulate the movements of the nominal exchange rate in line with the prevailing target for economic growth. Exchange rate depreciations should also be backed up by other stabilization policies to ensure that it from CBN Statistical Bulletin. The result revealed that exchange rate fluctuation has a positive and significant relationship with nominal GDP and it also has a significant impact on nominal GDP; exchange rate fluctuation has a positive and insignificant relationship with inflation rate in Nigeria; and exchange rate fluctuation has a negative and significant relationship with balance of payment in Nigeria and both has a positive impact on the Nigerian economy. The monetary authorities should unify the foreign exchange market rates to ensure that inflationary targeting is more accurately attained through exchange rate policies and other monetary policies. Such policies could include raising interest rates, unifying exchange rates across all windows, and the adequate supply of forex backed-up with restrictions on its use.
Keywords*: Exchange rate fluctuation, nominal GDP, inflation, balance of payment.*

Introduction

The Nigeria economy has been programmed to become a developed economy in the world by the year 2050. An important route to achieving this vision is to pursue a quick and sustained economic growth and development through a well-managed exchange rate policy. An efficient exchange rate policy is a stimulus for boosting economy position (Obi, 2016). Fluctuation in exchange rate is a crucial factor that influences economic performance, this is because of its impact on macroeconomic variables such as inflation rate, export prices, imports, interest rate and outputs (Adeniran, Yusuf & Adeyemi, 2014). The persistent depreciation in the exchange rate has led to a shortage in foreign exchange for the importation of essential inputs

for the industrial sector which has led to high costs of production in the economy. The appraisal of fluctuation in foreign exchange as well as its management has in the course of time particularly after the collapse of the Breton Woods agreement in 1973 pulled very significant momentum cause by academics and policy makers; foreign exchange which describes the conversion of a country's currency to another at a certain rate or the specific value of currency that can buy an amount of another currency. Over the years, Nigeria has undergone different exchange rate policies, either depreciation or appreciation, depending on the policy thrust of the government of the day. Aliyu (2011) noted that appreciation of exchange rate results in increased imports and reduced exports, while depreciation expands exports and discourages imports. Also, depreciation of exchange rate tends to cause a shift from foreign goods to domestic goods. Thus, it leads to diversion of income from importing countries to countries exporting, through a shift in terms of trade, and this tends to have impact on the exporting and importing countries' economic balance of trade and growth. Although, a number of exchange rate reforms have been carried out by successive governments, the extent to which these policies have been effective in promoting exports has remained unascertained. This is because despite government efforts, the performance of the Nigerian economy remains very slow.

In Nigeria, the currency rate regime has shifted from controlled to deregulate throughout time. Ewa (2011) acknowledged that the naira's exchange rate was very steady from 1973 to 1979, when the country was experiencing an oil boom and agricultural products contributed to more than 70% of the country's gross domestic product (GDP). When the Federal government adopted the Structural Adjustment Policy (SAP) in 1986, the country transitioned from a peg to a flexible exchange rate regime in which the exchange rate is not entirely determined by market forces, but rather the prevailing system is the managed float, in which monetary authorities intervene periodically in the foreign exchange market to achieve some strategic objectives (Mordi, 2006). The choice and management of an effective exchange rate regime is vital to attain macroeconomic stability, growth and development. An ill-managed exchange rate policy could have a negative effect on economic growth and development. Omojimite and Akpokodje (2010) asserted that high volatility in exchange rate usually has negative effect on price discovery, export performance and sustainability of current account balance. This is possible for a country like Nigeria, in which the economy is subjected to the vicissitudes and vagaries of the oil market such that shocks in international oil prices were immediately felt in the domestic economy. Owolabi and Adegbite (2013) stated that Nigeria's exchange rate volatility tends to affect valuation of the Naira. This in turn encourages imports and discourages exports and over-dependence on imported inputs. This movement of the exchange rate along the path of depreciation since 1986 has raised a lot of questions on the impact of exchange rate policies on the Nigerian economy. Knowing the extent of effect this rise in exchange rate has on

microeconomic variables such as real gross domestic product, inflation rate and balance of payment is the answer that this work seeks to provide.

Literature Review

Central Bank of Nigeria (2016) defined exchange rate as the current price market price for which one national currency can be exchanged for another. It is normally expressed as the number of units of a domestic currency that will purchase one unit of a foreign currency or the number of units of a foreign currency that will purchase the unit of a domestic currency. Exchange rate is the rate at which a currency is exchanged for another currency. It can also be said to be the price of one country's currency in relation to another country (Eyung, 2021). It represents the amount of one currency that can be exchanged for a unit of another currency. Simply put, it represents the amount of one currency that can be exchanged for a unit of another currency. It is referred to as the ratio at which a unit of currency of one country is expressed in terms of another currency. Exchange rate is the price of one unit of a country's currency quoted in terms of another country's currency. The price of one country's currency represented in terms of another currency is known as the exchange rate. It is the exchange rate between a foreign currency and the currency of the home country. It also specifies the value of one currency in terms of another. It determines the relative prices of domestic and foreign goods, as well as the strength of external sector participation in international trade.

This study is pursed within the premises of the Purchasing Power Parity (PPP). Purchasing Power Parity (PPP) theory of exchange rate was developed by Gustav Cassel, a Swedish economist, in the early 20th century. Cassel introduced this theory in 1918 to better understand and explain the relationship between exchange rates and relative price level of different countries. The purchasing power parity theory is an important concept in the field of international economic and exchange rate determination. It provides a framework for understanding how relative prices and inflation rates influence exchange rates between countries. The purchasing power parity theory is based on the idea that in the long run, exchange rate should equalize the purchasing power of different countries. In other words, a unit of currency should have the same value in terms of purchasing goods and services across different countries. To better understand the purchasing power parity theory, we need to look at its main forms: Absolute PPP and Relative PPP. Absolute PPP states that the exchange rate between two countries should be equal to the ratio of the price levels of a basket of goods in those countries. For example, if the price level in country A is twice as high as that in country B, according to absolute PPP, the exchange rate should be 2:1. Relative PPP, on the other hand, focuses on changes in the price levels and inflation rates between countries. It argues that exchange rate changes should reflect the differential changes in the prices over time. If the rate in country A is higher than that in country B, the currency of country A should depreciate relative

to the currency of country B.The implications of the PPP theory are significant for exchange rate forecasting, trade, and investment decisions. By examining whether a currency is overvalued or undervalued according to PPP, investors and businesses can potentially take advantage of discrepancies in exchange rate. If a currency is estimated to be undervalued according to PPP, one might consider purchasing assets denominated in that currency, as it is expected to appreciate in the future. However, it is worth noting that PPP is not a flawless theory and has its limitations. In the short run, exchange rates can deviate significantly from their PPP values due to factors such as speculative activities, capital flows, government interventions, and market inefficiencies. Moreover, PPP assumes the absence of trade barriers, transportation costs, and other factors that can influence relative prices.

Empirically, Bala *et al* (2016) examined the impact of exchange rate fluctuation on the Nigeria's economic growth from 1986 to 2015. The main type of data used in this study is secondary; sourced from Central Bank of Nigeria Statistical Bulletin of various issues. From 1986 being the year the Nigerian monetary authority changed from fixed exchange rate system to flexible exchange rate system. The correlation and regression analysis of the ordinary least square (OLS) were used to analyse the data. The result revealed that exchange rate has positive impact but, not significant with (co-efficient =0.01275, t = 1.35) and this affirms previous studies that developing countries are relatively better off in the choice of flexible exchange rate regimes. The result also indicated that interest rate has positive impact but, not significant with (co-efficient =0.1353, t = 0.26), while rate of inflation have negative impact on economic growth, but not significant with (co-efficient = -0.1363, t = -0.69).

Isola, Oluwafunke, andAhmed (2016) investigated the impact of exchange rate fluctuation on economic growth in Nigeria within the context of four profound theories: purchasing power parity; monetary model of exchange rates; the portfolio balance approach; and the optimal currency area theory. Data was collected from the CBN statistical bulletin in Nigeria from 2003– 2013 and the Autoregressive Distributed Lag (ARDL) model was employed to estimate the model. In the model, real GDP (RGDP) was used as the proxy for economic growth while Inflation rate (IF), Exchange rate (EXC), Interest rate (INT) and Money Supply(M2) as proxies for other macroeconomic variables. The empirical results showed that exchange rate fluctuation has no effect on economic growth in the long run, though a short run relationship exists between the two. Based on these findings, this paper recommended that the Central bank for policy purposes should ensure that stern foreign exchange control policies are put in place in order to help in appropriate determination of the value of the exchange rate. This will in the long run help to strengthen the value of the Naira.

Iyeli and Utting (2017) reviewed the effect of exchange rate volatility on Economic Growth in Nigeria from 1970 to 2011. The model formulated depicts Real GDP as the dependent variable while Exchange Rate (EXR), Balance of Payment (BOP) Oil Revenue (OREV) and inflation (INF) are independent variables. These data were sourced and extracted from CBN Statistical Bulletin. We employ the Johansen Co-integration estimation techniques to test for the short and long runs effect of the variables used. The ADF test reveals that all the variables are stationary. From the parsimonious model, the results show that OREV and EXR are positively related to GDP. Further findings reveal that there exist two equations at 5% level in both trace and Max – Eigen statistic. This implies that exchange rate volatility and oil revenue contributes positively to GDP in the long run.

Achuoak, Ousama, andMuorad (2018) studied the impact of exchange rate volatility on economic growth. An empirical investigation based on a sample of 45 developing and emerging countries over the period of 1985~2015 is conducted using the difference and system generalized method of moments estimators. Findings suggest that the generalized autoregressive conditional heteroskedasticity-based measure of nominal and real exchange rate volatility has a negative impact on economic growth. Also, the effect of exchange rate volatility depends on the exchange rate regimes and financial openness, that is, volatility is more harmful when countries adopt flexible exchange rate regimes and financial openness. Dabwor, *et al*. (2018) examined the effect of exchange rates on balance of payments in Nigeria between 1999 and 2016 using Autoregressive Distributed Lag (ARDL) approach. Findings from the study revealed that nominal exchanges rate have a significant effect on Nigeria's balance of payment. The implication of this is that exchange rate liberalization had a significant effect on Nigeria's overall balance of payments between 1999 and 2016. The empirical findings further showed that there is a causal link between Nigeria's balance of payment and exchange rates. The study thus recommends that effort be made to increase the consumption of made in Nigeria goods, which includes the usage of raw material that can be sourced locally by Nigerian industries in order to increase foreign exchange earnings. Appropriate macro-economic policy mix should be enacted to ensure stable foreign exchange earnings that will further enhance Nigeria's balance of payment positions. Ufoeze *et al* (2018) investigated the effect of exchange rate fluctuations on Nigerian economy. The fixed and floating exchange eras were compared to know the exchange rate system in which the economy has fairly better. The time period covered was 1970 to 2012. The study employed the ordinary least square (OLS) multiple regression technique for the analysis. The coefficient of determination (R2), F-test, t-test, beta and Durbin-Watson were used in the interpretation of the results. The resulted revealed that about 85% of the changes in macroeconomic indicators are explained in the fixed exchange era. In the floating exchange era, 99% was explained while the whole periods has 73% explanatory power, hence the floating exchange era (1986 to date) is more effective in explaining economic trends in Nigeria. Also, exchange rate has significant

positive effect on GDP during the fixed exchange rate era and negative effect during the eras floating and all-time; inflation has insignificant negative effect on GDP during the fixed exchange era; significant effect in floating era and significant negative effect in the all-time period; money supply has insignificant negative effect on GDP during the fixed exchange era; and significant positive effect during the floating and all-time period; and oil revenue has significant positive effect on the GDP in all the exchange rate regimes (floating, fixed and all-time) in Nigeria. The study thus concludes that exchange rate movement is a good indicator for monitoring Nigerian economic growth. So far, exchange rate has always been a key economic indicator for Nigeria. The floating exchange period has outperformed the fixed exchange rate in terms of contribution inflation, money supply and oil revenue to economic growth. This indicates that the floating exchange rate has been a better economic regime for sustainable economic growth in Nigeria. From the findings, it is evident that oil revenue has positive effect in Nigeria and has remained the mainstay of the economy.

Jonathan and Rosemary (2019) reviewed the effects of exchange rate fluctuation on economic growth in Nigeria from 1981-2018 using non-experimental research design. Autoregressive Distributed Lag Model (ARDL) model was used for data analysis, dependent variable for the study is Real Gross Domestic Product (RGDP) which is used as a proxy for Economic Growth and the independent variables are Import (IMPO), Export (EXP), Exchange rate (EXR), government capital expenditure (GOCEXP) and Inflation rate (INFR). The findings of the study revealed that exchange rate, export, government capital expenditure have positive impact on RGDP both in the long-run and short-run however IMP has a negative impact on RGDP both in the short-run and long-run meanwhile INFR has a negative and statistically significant impact on RGDP in the short run.

Kanu and Nwadiubu (2020) investigated the impact of exchange rate volatilities on international trade in Nigeria. The study made use of Secondary data from 1996 to 2018. Econometric tools were used to ascertain relationships. The VAR model estimates indicate an inverse relationship between Export, Import and REER in current periods. A unit increase in export and import in a particular year leads to about 0.9% and 0.4% decrease in REER respectively. Variance decomposition analysis suggests that the shocks partially explain fluctuations in REER, as well as exports and imports. The Impulse response analysis indicates a negative association between export and real effective exchange rate while it was majorly positive for imports throughout the ten periods. The causal effect reveals that import causes exports but that exports do not granger cause imports. This could have serious implications for growth in Nigeria, as a reduction in the growth of exports could reduce the foreign exchange earnings available for the financing of developmental projects. At the same time, a decline in imports could affect domestic

production and consumption. It could also impinge negatively on the balance of payment positions for Nigeria.

Nwobia, Ogbonnaya-Udo, and Okoye (2020) studied the effect of exchange rate fluctuation on Nigeria external trade from 2000 to 2019. The study opined that the Nigerian economy relies so much on imported goods for its survival. There are four refineries in Nigeria but none of them is functional thereby forcing the government to equally import refined oil even when Nigeria is the highest oil producing country in Africa. The penchant for consuming imported goods makes the exchange rate to fluctuate rapidly and uncontrollably in some cases. The study made use of secondary data sourced from central bank of Nigeria statistical bulletin of various issues from 2000 being the year of monetary authority regime of flexible exchange rate to 2019. The correlation and regression analysis of the Ordinary Least Square (OLS) were used to analyse the data. The result shows that the three variables; exchange rate, balance of payment, and inflation rate have significant effect on the Gross Domestic Product (GDP) and external trade of Nigeria; Exchange rate has a negative effect on the GDP because as it increases, the external trade is negatively affected.

Akinwolere (2021) examined the impact of exchange rate volatility on economic growth in Nigeria. The study covers the period of 1986 to 2019. Using time series data, the methodology adopted is the Vector Error Correction Mechanism to explore the impact of exchange rate volatility on the selected macroeconomic variables. The result indicated that exchange rate volatility has a significant impact on economic growth; specifically it has a positive impact on inflation, unemployment and balance of trade. On the other hand it has a negative impact on economic growth and investment. Ani and Udeh (2021) carried out an investigation on the effect of exchange rate on the economic growth of Nigeria. It specifically looked at effect of exchange rate on gross domestic product (GDP), gross national product (GNP) and unemployment. Secondary data from the Central Bank of Nigeria Statistical Bulletin were collected for a period of ten years, 2009 to 2018. Ex-post facto research design was utilized. While some diagnostic tests were carried out to confirm the integrity of the data and their relatedness in both short and long term basis, Ordinary Least Square technique was employed in the analysis of hypotheses. It was found that while exchange rate had significant effect on GDP and GNP, it was non-significant on unemployment. This implies that micro economic indices of GDP and GNP could be used to consciously adjust standard of living of the citizens.

Eyung, Agbor and Orajekwe (2021) carried out an investigation on the effect of exchange rate fluctuation on economic growth of Nigeria: 1996 – 2016. The research adopted Rudi Dornbusch Exchange rate overshooting model as the main theoretical framework. The investigation used variables such as economic growth (GDP) as dependent variable and exchange rate, interest rate, and inflation rate as independent variables. The study employed multiple regression analysis with Ordinary Least

Square (OLS) econometric technique to examine the effect of exchange rate fluctuation on the economic growth in Nigeria.

The result showed that exchange rate has significant positive effect on economic growth in Nigeria. Iheanachor and Ozegbe (2021) investigated the effects of persistent exchange rate fluctuations on Nigeria's economic performance. It was motivated by the quest to ascertain why concerted efforts of the monetary authorities in Nigeria to pursue internal and external balances yielded little or no positive results in recent periods. The study employed the autoregressive distribution lag (ARDL) technique to test the short-run and long-run effects of exchange rate fluctuations on economic growth using annual time series data from 1986 to 2019. The empirical result revealed that the exchange rate, net foreign direct investments, and inflation rate had a significant adverse impact on Nigeria's economic growth in the long run. By implication, the net effect of this study established that excessive exchange rate fluctuations are detrimental to Nigeria's economic growth.

Ewubare and Ushie (2022) reviewed the relationship between exchange rate and economic growth in Nigeria between 1981 and 2020. The specific objectives are to determine the effects of exchange rate, inflation and interest rate on gross domestic product (GDP). The data on the variables were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and World Development Indicators, and analysed using descriptive statistics, unit root as well as bounds co integration tests and ARDL model. The unit root test results showed that the variables are mixed integrated. While inflation is stationary at levels, the other variables in the model were stationary at first difference. The bounds co integration test showed that long run relationship exists between GDP growth and the underlying explanatory variables. The findings showed that exchange rate and inflation negatively impacted on economic growth. This finding indicates that increase in exchange rate and price level is detrimental to the growth of the Nigerian economy. There is evidence of a significant positive effect of interest rate on GDP growth. This finding explains the reality in Nigeria, where businesses and households tend to borrow even as interest rate increases, but tend to cut corners by reducing the quality of their products and services or pass-on the increased costs of borrowing to consumers by increasing prices.

Ijirshar *et al* (2022) explored the impact of exchange rate on trade flow in Nigeria from 1986 to 2021. The study utilises linear and nonlinear autoregressive distributed lag (ARDL and NARDL) models to test the J-Curve hypothesis and the Marshall-Lerner condition in Nigeria. The study found symmetric effects of exchange rate on trade balance, exports, and imports. The findings also show that real exchange rate depreciation has a strong negative influence on trade balance and exports in the short run but positive in the long run, exhibiting the shape typology of the J-curve. Furthermore, the study reveals evidence of the Marshall-Lerner condition since the

sum of the elasticity of export and import is greater than unity. Thus, there is room for long run net trade improvement.

Okosu (2022) examined the impact of exchange rate volatility on economic growth in Nigeria from the year 1981 to the year 2020. The study adopted secondary data (i.e. time series) obtained from World Bank National Account data and Central Bank of Nigeria Annual Statistical Bulletins, subjecting them to statistical analysis for relevant inferences to be made. The study made use of variables such as; Growth Rate of Gross Domestic Product (GRGDP), Exchange Rate Volatility (EXRV), Balance of Trade (BOT), Oil Price (OILP) and Inflation (INF) Rate. The variables were subjected to unit root test and they were stationary at different order of I(0) and I(1). Since the Variables were not all stationary at level but a mixed series, the ARDL bound test of co-integration was used to test for co-integration among them. Using the bound test, the variables were found to be co-integrated at 1% level of significance. The ARDL result indicated that; Exchange rate volatility has a significant impact on economic growth, with the impact being negative. In addition, other economic variable such as inflation has a negative and significant impact on economic growth while oil price have a positive and significant impact on economic growth. On the other hand, BOT has a positive effect on growth but the impact was significant at the 10 percent level.

Ukangwa and Ikechi (2022) explored the effect of Nigeria's exchange rate on the economic growth of Nigeria. It is focused on establishing the extent to which Naira rate have influenced economic growth from using data spanning between 1987 and 2018; and the extent to which the Naira rate has influenced inflation in Nigeria within the same time frame. This study however employed Ordinary Least Squares technique of analysis to construct a regression model to test stated hypotheses. Findings revealed that the Naira rate has no significant impact on economic growth in Nigeria and that the Naira rate has a significant influence on inflation rate in Naira. The study, therefore, recommends that the export base of Nigeria should be strengthened to ensure a sustainable impact and that local manufacturing should be fully encouraged. Umaimah and Aliyu (2022) carried out an investigation on the Effects of Exchange Rate on Food Inflation in Nigeria: A Non-Linear ARDL Approach from 2008 to 2020. The investigation opined that over the years, exchange rate has been unstable in the Nigerian economy, despite the stabilization policies introduced by successive governments in the country. This has consequently affected the prices of food products in the country. The study employed the Non-Linear ARDL model to examine the asymmetric effects of exchange rate on food inflation in Nigeria, using quarterly data from 2008Q1 to 2020Q4. The results of bounds testing to Co-integration indicate that there is a long-run relationship between exchange rate and food inflation along with GDP. In addition, both in the long-run and short-run, there is a significant and asymmetric positive relationship

between exchange rate and food inflation. GDP is found to be negative and significant relationship on food inflation.

Ajayi and Ajayi (2023) evaluated the effect of foreign exchange fluctuations on economic growth in Nigeria. Specifically, examined the relationship between exchange rate and economic growth in Nigeria; investigated the effect of balance of payment on economic growth in Nigeria and evaluated the effect of trade openness on economic growth in Nigeria. The quantitative and qualitative research design was adopted in the study. Secondary time series data spanning thirty -one years (1989-2020) was gathered in the study. Data gathered in the study was estimated using descriptive statistics, unit root analysis, Autoregressive Distributed Lag (ARDL) analysis, parsimonious error correction model and other post estimation tests. Findings from the study established that Balance of payment exerts negative insignificant effect on economic growth in Nigeria both in the long and short run with coefficient estimate of -1.163405 ($p=0.8400<0.05$) and -3.223405 ($p=0.0535>0.05$) respectively; exchange rate affects economic growth in Nigeria positively and significantly both in the short and long run with coefficient estimate of 76.64195 ($p=0.0000<0.05$) and -57.92612 ($p=0.0000>0.05$) respectively; trade openness exerts negative significant effect on economic growth in Nigeria in the short and long run with coefficient estimate of -110.2135 ($p=0.0086<0.05$) and -32.10217 ($p=0.0087<0.05$) respectively and inflation rate exerts positive significant effect on economic growth in Nigeria in the long run and positive insignificant effect in the short run with coefficient estimate of 84.76427 ($p=0.0350<0.05$) and 19.95149 ($p=0.0858>0.05$) respectively.

Eroglu and Olayiwola (2023) assessed the impact of exchange rate on Nigeria's economic growth (1981-2020) by decomposing it into positive and negative components. The study made use of variables such as exchange rate, capital stock, knowledge stock, and inflation rate. The study utilized annual time series data from 1981 to 2020 on real GDP as a measure of economic growth and the US$ to naira exchange rate as a measure of exchange rate. A non-linear ARDL model was used to decompose the effect of exchange rate on economic growth. Also, asymmetric effects test was use d to measure the effects of changes in the value of the naira. The findings showed that in the short run, when the Naira depreciates against the US dollar, economic growth tends to decline, while when it appreciates, economic growth tends to increase. In the long run, these effects work in the opposite direction. In addition, the test for asymmetric effects shows that the way in which the appreciation of the naira affects economic growth differs significantly from that of its depreciation. Miftahu and Isaac (2023) examined the impact of exchange rate fluctuations on economic growth in Nigeria. The main type of data used in the study is secondary; sourced from Central Bank of Nigeria Statistical Bulletin of various issues. From 1986 being the year the monetary authority shifted from fixed exchange

rate regime to flexible exchange rate regime to 2019. The correlation and regression analysis of the ordinary least square (OLS) were used to analyze the data. The result revealed that exchange rate has positive effect but not significant with (â=0.014, t = 1.783, Pns) this affirms previous studies that developing countries are relatively better off in the choice of flexible exchange rate regimes. The result also indicated that interest rate and rate of inflation have negative effect on economic growth but not significant with (â = 0.002, t = 0.015, Pns) and (â = 0.023, t = 0.716, Pns) respectively.

Methodology

Research Design and Sources of Data

The researcher adopts the *ex-post facto* research design. The term *ex-post facto* translates to the phrase "after the fact". Thus, this research design involves drawing inferences and making generalizations about relationships among economic variables based on the analysis of historical data or past trends. This study employs the secondary time series data from 2001 to 2022 on the variables of the study. Data on exchange rate, inflation rate, balance of payment, and real gross domestic product were sourced from CBN Statistical Bulletin. The data were analysed using the Ordinary Least Square (OLS) regression and the Granger Causality test. The ordinary least square regression method was used to examine the nature of the relationship between the independent and dependent variables. On the other hand, the Granger Causality test examines the effect of one variable on another.

Model Specification

The study adopts a similar model to the model of Iyeli and Utting (2017). In the study of Iyeli and Utting (2017), Real GDP is expressed as a function of Exchange Rate (EXR), Inflation Rate (INF), Balance of Payment (BOP) and Oil Revenue (OREV). The model of their study is stated as;

$$ROA = \square_{\square}\square\square\square\square_{\square}EXR + \square_2INF + \square_3BOP + \square_4OREV + \square$$

However, this study models Nominal GDP, Balance of Payments (BOP), and Inflation Rate (INF) as functions of Exchange Rate Fluctuation (EXR). The functional model is stated thus;

$$NGDP = f(EXR) \quad 3.3$$

$$INF = f(EXR) \quad 3.4$$

$$BOP = f(EXR) \quad 3.5$$

The functional models are restated in econometric terms to account for econometric properties in the functional models. The econometric models are therefore stated as;

NGDP = □□□□□□EXR + □ 3.7

INF = □□□□□□EXR + □ 3.8

BOP = □□□□□□EXR + □ 3.9

Where □□is the constant term, □□ IS the regression coefficient and □ is the error term of the regression.

1. Results And Discussion

Descriptive Statistics

The descriptive statistics shown in Table 4.2 reveals that nominal GDP in Nigeria averaged ₦76,607.76bn per year over the reviewed period while balance of payment averaged ₦608.84bn. within the period under review, exchange rate has floated over an average of N207.02/$ with a standard deviation of N109.16/$ indicating high volatility of the exchange rate in Nigeria. The probability of the Jarque-Bera test statistic shows that except for balance of payment which has a Jarque-Bera p-value less than 0.05, all the variables are normally distributed (p>0.05).

Table 4.1: Descriptive Statistics

	EXR	NGDP	INFR	BOP
Mean	207.0272	76607.76	12.83545	608.8492
Median	154.0417	67347.15	12.55000	853.1628
Maximum	459.5000	199336.0	18.87000	5822.590
Minimum	112.0252	8234.494	5.380000	-13136.46
Std. Dev.	109.1622	55915.01	3.693514	4594.731
Skewness	1.150469	0.617979	-0.057841	-1.301763
Kurtosis	2.955687	2.361861	2.266185	4.630814
Jarque-Bera	4.854924	1.773577	0.505877	8.651407
Probability	0.088261	0.411977	0.776516	0.013224
Sum	4554.599	1685371.	282.3800	13394.68
Sum Sq. Dev.	250244.1	6.57E+10	286.4829	4.43E+08
Observations	22	22	22	22

Source: E-views 11.0 Descriptive Statistic Output, 2022

Ordinary Least Square Regression

The regression coefficients shown in Table 4.2, (485.28) reveal that the fluctuation of exchange rate positively relates to (predicts) the nominal GDP in Nigeria. It follows that every naira increase in the exchange rate (depreciation) will likely coincide in an increase of 485 billion naira in the nominal GDP of Nigeria. The probability value of 0.0000 is less than 0.05 indicating that this prediction is significant. The R-squared value of 0.8975 shows that about 89.8% of the trend of NGDP is explained by exchange rate fluctuations.

Table 4.2: OLS Regression for EXR and NGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXR	485.2770	36.65725	13.23823	0.0000
C	-23857.78	8536.890	-2.794669	0.0112
R-squared	0.897568	Mean dependent var		76607.76
Adjusted R-squared	0.892446	S.D. dependent var		55915.01
S.E. of regression	18337.57	Akaike info criterion		22.55780
Sum squared resid	6.73E+09	Schwarz criterion		22.65699
Log likelihood	-246.1358	Hannan-Quinn criter.		22.58116
F-statistic	175.2506	Durbin-Watson stat		0.441246
Prob (F-statistic)	0.000000			

Source: *E-views 11.0 OLS Regression Output, 2023*

The regression coefficients shown in Table 4.3 (0.013438) reveal that the fluctuation of exchange rate positively relates to (predicts) the inflation rate in Nigeria. It follows that every naira increase in the exchange rate (depreciation) will likely coincide in an increase of 0.01% in the inflation rate of Nigeria. The probability value of 0.0672 is greater than 0.05 indicating that this prediction is insignificant. The R-squared value of 0.157744 shows that only about 15.8% of the trend of inflation rate in Nigeria is explained by exchange rate fluctuations.

Table 4.3: OLS Regression for EXR and INFR

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INFR	0.013438	0.006943	1.935393	0.0672
C	10.05336	1.617016	6.217232	0.0000
R-squared	0.157744	Mean dependent var		12.83545
Adjusted R-squared	0.115631	S.D. dependent var		3.693514
S.E. of regression	3.473413	Akaike info criterion		5.414661
Sum squared resid	241.2920	Schwarz criterion		5.513846
Log likelihood	-57.56127	Hannan-Quinn criter.		5.438026
F-statistic	3.745745	Durbin-Watson stat		1.172129
Prob (F-statistic)	0.067209			

Source: *E-views 11.0 OLS Regression Output, 2023*

The regression coefficients shown in Table 4.4 (-27.88577) reveals that the fluctuation of exchange rate negatively relates to (predicts) the balance of payment in Nigeria. It follows that every naira increase in the exchange rate (depreciation) will likely coincide in a decrease of 27.89 billion naira in the balance of payment in Nigeria. The probability value of 0.0008 is less than 0.05 indicating that this prediction is significant. The R-squared value of 0.4389 shows that about 43.89% of the trend of BOP is explained by exchange rate fluctuations.

Table 4.4: OLS Regression for EXR and BOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BOP	-27.88577	7.049909	-3.955480	0.0008
C	6381.963	1641.812	3.887147	0.0009
R-squared	0.438924	Mean dependent var		608.8492
Adjusted R-squared	0.410871	S.D. dependent var		4594.731
S.E. of regression	3526.675	Akaike info criterion		19.26061
Sum squared resid	2.49E+08	Schwarz criterion		19.35979
Log likelihood	-209.8667	Hannan-Quinn criter.		19.28397
F-statistic	15.64582	Durbin-Watson stat		2.363436
Prob (F-statistic)	0.000781			

Source: E-views 11.0 OLS Regression Output, 2023

The result of the Granger Causality test shown in Table 4.5 reveals that the F-statistic is significant in the first case ($p<0.05$) and insignificant in the second case ($p>0.05$). Therefore, unidirectional causal relationship exists flowing from EXR to NGDP in Nigeria. This indicates that EXR causes changes in NGDP but NGDP does not cause changes in EXR.

Table 4.5: Granger Causality Test for EXR and NGDP

Null Hypothesis:	Obs	F-Statistic	Prob.
EXR does not Granger Cause NGDP	21	10.1808	0.0051
NGDP does not Granger Cause EXR		4.31650	0.0523

Source: E-views 11.0 Granger Causality Output, 2023

The result of the Granger Causality test shown in Table 4.6 reveals that the F-statistic is insignificant in both cases ($p<0.05$). Therefore, no causal relationship exists between EXR and BOP in Nigeria. This indicates that EXR does not cause changes in Inflation rate and neither does inflation rate cause fluctuations in exchange rate.

Table 4.6: Granger Causality Test for EXR and INFR

Null Hypothesis:	Obs	F-Statistic	Prob.
EXR does not Granger Cause INFR	21	3.90862	0.0636
INFR does not Granger Cause EXR		0.83287	0.3735

Source: E-views 11.0 Granger Causality Output, 2023

The result of the Granger Causality test shown in Table 4.7 reveals that the F-statistic is significant in the first case ($p<0.05$) and also significant in the second case ($p<0.05$). Therefore, a bidirectional causal relationship exists between EXR and balance of payments in Nigeria. This indicates that exchange rate fluctuation cause

changes in balance of payments, and in turn, balance of payments cause fluctuations in exchange rate.

Table 4.7: Granger Causality Test for EXR and BOP

Null Hypothesis:	Obs	F-Statistic	Prob.
EXR does not Granger Cause BOP	21	12.3276	0.0025
BOP does not Granger Cause EXR		6.38406	0.0211

Source: E-views 11.0 Granger Causality Output, 2023

Discussion of the Findings

The study examined the impact of exchange rate fluctuations on economic growth of Nigeria. Exchange rate fluctuation was measured in terms of the appreciations and depreciations of nominal exchange rate in Nigeria, while economic growth measures were made to include nominal GDP, Inflation rate and Balance of Payment. The data were analysed using the ordinary least square regression method and the Granger causality test. The findings of the study revealed that exchange rate fluctuations had a positive and significant relationship with the nominal GDP in Nigeria. The finding of the Granger Causality test also revealed that exchange rate fluctuations have a significant impact on the Nominal GDP in Nigeria. The combinations of the OLS regression and the Granger Causality test indicate that every time the exchange rate depreciates, it causes the value of nominal GDP to increase and each time the exchange rate appreciates, nominal GDP falls significantly. This finding is contrary to the expectation of the researcher. It also fails to confirm the theoretical position of The Exchange Rate Volatility Theory which posits that volatility increases risk of trade and therefore depresses trade flows. It also disproves the findings of the study of Achuoak *et al*. (2018) which revealed that nominal and real exchange rate volatility has a negative impact on economic growth. This findings however is consistent with the findings of Bala *et al*. (2016) which found that exchange rate fluctuations has positive impact on economic growth in Nigeria. Iyeli and Utting (2017) also found that exchange rate volatility contributes positively to the growth of the Nigerian economy on the long run.

The findings of the study also showed that exchange rate fluctuation has a positive and insignificant relationship with inflation rate in Nigeria. This finding goes against the researcher's prior expectation. It also negates the theoretical positions of the Exchange Rate Volatility Theory which suggests that exchange rate volatility should cause a decline in demand and ultimately a reduction in prices. The granger causality test further showed that exchange rate did not have significant impact on the inflation rate in Nigeria. As a result, it is difficult to predict how inflation reacts to appreciations or depreciations in the exchange rate in Nigeria. This finding is consistent with the outcomes of Akinwolere (2021) who found that exchange rate volatility has a positive impact on inflation rate in Nigeria.

Thirdly, the findings of the study showed that exchange rate fluctuation has a negative and significant relationship with Balance of Payments in Nigeria. This is in line with the priori expectation of the researcher. It confirms the positions of the Exchange Rate Volatility Theory which asserts that exchange rate volatility distorts economic predictions and therefore discourages trade flows between investors and other economic agents. The Granger causality test showed that exchange rate fluctuation does have a significant impact on balance of payments in Nigeria and in turn, balance of payment also causes fluctuations in the nominal exchange rate. This shows that as exchange rate fluctuates, it affects the international trade decisions between Nigeria and the rest of the world. Resultantly, as Balance of Payment increases or depreciates, it indicates the flow of trade between Nigeria and other countries and this affects the demand and supply of Naira relative to other countries' currencies. This then impacts the exchange rate in Nigeria. This finding also concurs with the finding of Kanu and Nwadiubu (2020) who found that exchange rate depreciations has negative impact on the imports and this affects domestic production and impinge negatively on the balance of payment position for Nigeria. Ijirshar *et al*., (2022) also revealed that that real exchange rate depreciation has a strong negative influence on trade balance and exports in the short run.

Conclusion and Recommendations

This research work examined the effect of exchange rate fluctuation on the economic growth in Nigeria. Based on the findings of the study, the researcher therefore comes to a conclusion that exchange rate fluctuation has significant impact on economic growth in Nigeria. This indicates the slow pace of economic growth in Nigeria can be attributed to the fluctuating exchange rate which continues to create uncertainty for investors and other economic agents. Furthermore, the exchange rate fluctuation can also be blamed for the poor balance of payment positions which Nigeria has recorded in recent times. The study concludes that in times of exchange rate depreciations which is characterized by an increase in the nominal exchange rate quotation, the balance of payment position of Nigeria has been worse off. The alarming rate of inflation in Nigeria however cannot be pinned on the fluctuations in the nominal exchange rate. Apparently, there are other factors that better explain or impact the rate of inflation in Nigeria other than inflation rate.

The monetary authority should adopt exchange rate policies that regulate the movements of the nominal exchange rate in line with the prevailing target for economic growth. Exchange rate depreciations should also be backed up by other stabilization policies to ensure that it has a positive impact on the Nigerian economy. The monetary authorities should unify the foreign exchange market rates to ensure that inflationary targeting is more accurately attained through, exchange rate policies and other monetary policies. Such policies could include raising interest rates, unifying exchange rates across all windows, and the adequate supply of forex backed-up with restrictions on its use. In times of high volatility of the exchange

rate, the monetary and fiscal authority should apply strict trade policies (embargoes on unnecessary imports, higher import duties, import quotas) to ensure that volatility of the exchange rate does not bastardize the balance of payment position of Nigeria. Exportation should be highly encouraged and importations should be heavily regulated.

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