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Exchange Rate and the Nigerian Economic Growth: An Empirical Analysis

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Abstract

This study examined the effect of exchange rate fluctuation on Nigerian economic growth (2001-2022), with exchange rate disaggregated into rate movement, money supply, inflation and interest rate while economic growth was proxied by real GDP growth rate. The objectives of the study were to examine the effect of exchange rate movement, money supply, interest rate and inflation rate on Nigerian economic growth. Secondary data were sourced from Central Bank of Nigeria statistical bulletin. Econometrics tools such as the t statistic, f statistic, standard errors, regression coefficients, causal relationship, R^2 and adjusted R^2 were employed for the study. The ordinary least square regression (OLS) technique was employed to analyze the data. While the findings of the study revealed causal relationships among the studied variables, it also shows that money supply has positive and significant effect on economic growth in Nigeria while exchange rate also has positive and significant effect on economic growth in Nigeria. However, inflation and interest rates have negative and insignificant effects on economic growth. It was recommended among others that the monetary authority should ensure adequate money supply to ensure stable economic growth/exchange rate; the monetary authority through CBN should reduce interest rate to guarantee a stable economic growth/exchange rate in Nigeria, while the monetary authority should devise a means to stabilize prices in the economy.

Keywords*:* Exchange Rates; Movements; Economic Growth; Nigeria

Introduction

The exchange rate is the rate at which one currency is exchanged for another. It is the price of one currency in terms of another currency that mostly determines the direction of a country's external sector, which largely influence the growth of the domestic economy (Gosselin and Parent, 2022). Exchange rate is the price of one unit of the foreign currency in terms of the domestic currency. The debate over what determines the choice of exchange rate regimes has continued unabated over some decades now. Friedman (1953) argued that in the presence of sticky prices, floating rates would provide better insulation from foreign shocks by allowing relative prices to adjust faster. His popular support for floating exchange rate stipulates that in the long run the exchange rate system does not have significant real consequences on the economy.

Therefore, countries tend to adopt a combination of different regimes such as adjustable peg, crawling peg, target zone/crawling bands, and managed float, whichever that suits their peculiar

economic conditions to improve growth. For instance, exchange rate managements in Nigeria have witnessed different significant changes over the past four decades. Nigeria maintained fixed exchange rates from 1960 till the breakdown of the Bretton Woods Monetary System in the early 1970s. Between 1970 and mid 1980 Nigeria exchange rate policy shifted from fixed exchange rate to a pegged arrangement and finally, to the various types of the floating regime since 1986 following the adoption of the Structural Adjustment Programme (SAP) (Abu, 2018).

Economic growth connotes a sustained increase in a country's national income. It is on this note that Benson and Victor, (2012) noted that over the years, various efforts had been made by the government to maintain a stable exchange rate in order to influence economic growth in Nigeria. Maintaining an acceptable exchange rate is not an end itself according to Dunba and Tinhumbu (2021); rather, there are some domestic policies that must be adjusted to make rate policies workable. These policies impact on exchange rate, which in turn impact on the external sector that eventually influences economic growth (Sachs, 2021). Therefore, the questions that must be asked surround the nature of implementation of inflationary policy, interest rate policy and the nation's policy on money supply.

Also, there has been an ongoing debate on the appropriate exchange rate policies in developing countries, Nigeria inclusive, that are likely to impact on economic performance. In judging the desirability of exchange rate fluctuations, it is necessary to evaluate the macroeconomic factors that influence the fluctuations (Dunba and Tinhumbu 2021; Sachs, 2021); which implies that the several exchange rate policies implemented over the years in Nigeria cannot be de-linked from the aforementioned domestic policies. This study intends to examine not just how these domestic policies had impacted on exchange rate movements over the years in Nigeria, but also their overall impact on economic growth from 2001 – 2022.

Therefore, the specific objectives of this paper include:

i. To determine the effect of money supply on economic growth in Nigeria.
ii. To ascertain the effect of interest rate on economic growth in Nigeria.
iii. To ascertain the effect of inflation rate on economic growth in Nigeria.
iv. To establish the effect of exchange rate movement on Nigeria's economic growth.

Literature Review

Conceptual Issues

Concept of Exchange Rate

Exchange rate is conceptualized as the price of one currency (the domestic currency) in terms of another (the foreign currency) (Sachs, 2021). Exchange rate plays a key role in international economic transactions because no nation can remain in autarky due to varying factor endowment. Movements in the exchange rate have ripple effects on other economic variables such as foreign reserved, interest rate, inflation rate, unemployment,money supply, among others (Oladipupo and Ogheneovo, 2019). These facts underscore the importance of exchange rate to the economic well-being of every country

that opens its doors to international trade in goods and services.

Abu (2018), defines exchange rate as the price of one currency in terms of another. The increase or decrease of real exchange rate indicates strength and weakness of currency in relation to foreign currency and it is a standard for illustrating the competitiveness of domestic industries in the world market, Azeez, Kolapo and Ajayi, (2020) noted that when there is deviation of this rate over a period of time from the benchmark or equilibrium is refer to exchange rate volatility. It also indicates that misalignment of exchange rate has occurred where there is multiplicity of markets parallel with the official market.

Omontor (2018), asserted that exchange rate is the price that trader has to pay for acquiring currency of another country. This price is either set by the government (fixed or regulated exchange rates) or float in the market (determined by forces of supply and demand). In the case of market's determined exchange rate, the prices would be set at where supply and demand meets. The demand for foreign currency comes from people or firms who want to buy goods and services from other country (imports). They need foreign currency to pay for these goods and services. Supply of foreign currency also comes from people who want to invest or buy goods and services from home country (exports). According to this theory, when a demand for foreign currency is more than the supply just like any other market, the price or rates go up (depreciation of home currency). That is, Nigeria's naira buys less US dollar in the foreign exchange markets. On the other hand, if the demand for foreign currency falls, the prices go down as well (appreciation of home currency). If supply of foreign currency is in excess supply, its prices or rates go down. That is, Nigeria naira buys more US dollars in the market. Sometimes, the word 'weak' or 'strong' are used in different literatures for depreciation and appreciation respectively.

Concept of Money Supply

Money supply is all the currency and other liquid instruments in a country's economy on the date measured. The money supply roughly includes both cash and deposits that can be used almost as easily as cash (Dunba and Tinhumbu, 2020). Governments issue paper currency and coin through some combination of their central banks and treasuries. Bank regulators influence the money supply available to the public through the requirements placed on banks to hold reserves, how to extend credit, and other money matters (Gosselin and Parent, 2022)

Money supply can also be defined as the sum of all the money holdings of all the members of the society. This could be either M1 or M2 in Nigeria, M1, M2 and M3 in United Kingdom (UK) or M1, M2, M3 and M4 in United States of America (USA). The M1 is a narrow measure of money supply, it focuses on the role of money as a medium of exchange and defines money as "currencies in circulation outside the banks plus demand deposits held in banks" = C+DD. The central bank of Nigeria defines M1 as currencies outside banks plus positively held demand deposits. M2 is a broad measure of money supply. It includes savings and

time deposits =C + DD for M1 +SD+TD for M2 (Kevin, Roland and Sashana, 2022). Economist differs on the effect of money supply on economic growth. While some agreed that variations in the quantity of money is the most important determinant of economic growth and that countries that denote more time to studying the behavior of aggregate money supply rarely experience much variations in the economic activities (Handler 1997).

Interest Rate

In Nigeria the Central Bank of Nigeria (CBN) has significant influence on interest rates and setting up of monetary policies. Todaro and Smith (2016) asserted that monetary and fiscal policies play a major direct and indirect role in governmental efforts designed to expand economic activity in times of unemployment and surplus capacity and to contract that activity in times of excess demand and inflation.

The level of interest rates and the aggregate supply of money in circulation are the two basic instruments of monetary policies which can either be achieved by controlling the growth of the money supply as argued by monetarist theorist or expanding the supply of money in circulation which in turn leads to excess demand thereby causing the interest rates to decline as argued by the Keynesian economists. These are easily achieved in developed countries where there is highly organized, economically interdependent and efficiently functioning money and credit markets. Adebiyi (2020) defines interest rate as the return or yield on equity or opportunity cost of deferring current consumption into the future. Some examples of interest rates includes saving rate, lending rate and discount rate.

Inflation Rate

The concept often referred to as inflation has been a major issue in the policy decision in most of the developing countries. Inflation is one of the most frequently used terms in economic discussions, yet the concept is variously misconstrued. There are various schools of thought on inflation, but there is a consensus among economists that inflation is a continuous rise in prices, inflation depicts an economic situation where there is a general rise in the prices of goods and services continuously, where "too much money is chasing too few goods" Solow and Swan (1956). Jhingan, (2015) defined inflation as a persistent and appreciable rise in the general level of prices. When there is inflation, the currency losses purchasing power. The purchasing power of a given amount of naira in the economy will be smaller over time. In the definition of inflation, two things must be borne in mind. First, is aggregate, which implies that the rise that constitutes inflation must cover the entire basket of goods in the economy as distinct from an isolated rise in the prices of a single commodity or group of commodities. Secondly, the rise in the aggregate level of prices must be continuous for inflation to be said to have occurred. The aggregate price level must show a tendency of a sustained and continuous rise over different time periods.

Economic Growth

Economic growth refers to an economy's progress such as increase in per-capita income of Gross Domestic

Product of a country over time (Todaaro and Smith, 2016). In rich countries, increasing income levels is referred to as "economic growth," while in impoverished countries it is referred to as "economic development" (Maddison, 1982). According to Hicks (1987), the problems of developing countries are related to the development of unused resources even though their uses are well-known, whereas the problems of developed countries are related to growth, with the majority of their resources already known and developed to a large extent. When comparing one period of time to the next, economic growth is defined as a rise in an economy's capacity to generate products and services. It can be expressed in nominal or real terms, with the latter factoring in inflation (Sachs 2021). Although alternative metrics are sometimes employed, aggregate economic growth is traditionally quantified in terms of gross national product (GNP) or gross domestic product (GDP). The percentage change in the quantity of goods and services produced from one year to the next is the economic growth rate. It is the same as the actual GDP growth rate (Todaro and Smith, 2016).

Theoretical Literature

The theoretical literature of this study focuses on the Purchasing Power Parity Theory, as well as the Interest Rate Parity (IRP) theory, which links spot exchange rates to interest rates.

Interest Rate Parity Theory

This theory which is associated with Sir Menard Keynes hinges on changes in exchange rate between two currencies adjusted for short term interest rate differentials and changes in the forward exchange rate. For there to be a parity in the interest rate, the interest rate differentials between two currencies must be equal to the change in the forward exchange market.

Interest rate parity connects interest, spot exchange, and foreign exchange rates. It plays a crucial role in Forex markets. IRP theory comes handy in analysing the relationship between the spot rate and a relevant forward (future) rate of currencies. According to this theory, there will be no arbitrage in interest rate differentials between two different currencies and the differential will be reflected in the discount or premium for the forward exchange rate on the foreign exchange. The theory therefore stresses on the fact that the size of the forward premium or discount on a foreign currency is equal to the

If IRP theory holds, experts are of the view that it can negate the possibility of arbitrage (Jhingan, 2015). It means that even if investors invest in domestic or foreign currency, the return on investment will be the same as if the investor had originally invested in the domestic currency. When domestic interest rate is below foreign interest rates, the foreign currency must trade at a forward discount. This is applicable for prevention of foreign currency arbitrage.

If a foreign currency does not have a forward discount or when the forward discount is not large enough to offset the interest rate advantage, arbitrage opportunity is available for the domestic investors. So, domestic investors can sometimes benefit from foreign investment. When domestic rates exceed foreign interest rates, the foreign currency must trade at a forward premium. This is again to offset

prevention of domestic country arbitrage. When the foreign currency does not have a forward premium or when the forward premium is not large enough to nullify the domestic country advantage, an arbitrage opportunity will be available for the foreign investors. So, the foreign investors can gain profit by investing in the domestic market.

The Purchasing Power Parity (PPP) Theory

The Purchasing Power Parity (PPP) theory was propounded by Cassel (1916). It is widely known as the law of one price. Purchasing Power Parity Theory postulates that exchange rates between two currencies are at equilibrium when the purchasing power of these currencies is the same in each country (Amano and Norden, 2021). This means that exchange rate between two countries should equal the ratio of these two countries' price level of a fixed basket of goods and services. When the domestic price level of a country is increasing that is, when a country experiences high inflation, the exchange rate of that country's currency must depreciated in order to return to PPP.

The Purchasing Power Parity (PPP) demonstrates the relationship between prices and exchange rate. The use of the Purchasing Power Parity as a theory of exchange rate determination was revealed in the works of Cassel (1918). Cassel recommended the Purchasing Power Parity as a means of managing pre–world war I exchange rate parities for countries determined to have gold standard system after the war.

Cassel (1916) postulate that nominal exchange rate of a country's currency reflects the purchasing power of that country's currency, when compared with another country's currency. Cassel (1916) further opined that a purchasing power exchange rate existed between any two countries; this is measured by the reciprocal of one country's price level against that of the other. According to the purchasing power theory, movements of exchange rates are influenced by the difference between the domestic and foreign rates of inflation. When domestic inflation relative to changes in foreign prices increases, there would be an appreciation in exchange rate value, and vice versa (Khondker, Bidisha and Razzaque, 2012).

Empirical Review

Shehu and Aliyu (2016), estimate the long run behavioral equilibrium exchange rate in Nigeria. They used quarterly data from 1984 to 2014 and derive a Behavioral Equilibrium Exchange Rate (BEER) and a Permanent Equilibrium Exchange Rate (PEER). Regression results show that most of the long-run behavior of the real exchange rate could be explained by real net foreign assets, terms of trade, index of crude oil volatility, index of monetary policy performance and government fiscal stance. On the basis of these fundamentals, four episodes each of overvaluation and undervaluation were identified and the antecedents characterizing the episodes were equally traced to the archive of exchange rate management in the country within the review period. Among others for instance, large inflow of oil revenues into the country and stable macroeconomic performance were discovered to account for undervaluation of the real exchange rate between 2001 and 2014 in Nigeria. The results further suggest that

deviations from the equilibrium path are eliminated within one to two years.

Devereux and Engel (2019), directly examine how price setting affects the optimal choice of exchange rate regime. They find that when prices are set in consumers' currency, floating exchange rates always dominate fixed exchange rates. When prices are set in producers' currency, there is a trade-off between floating and fixed exchange rates. Exchange rate adjustment under floating rates allows for a lower variance of consumption, but exchange rate volatility itself leads to a lower average level of consumption. The implication from the simple analysis of their study indicates that, if the exchange rates is volatile, fixing exchange rates to both US dollar and Japanese Yen is better than floating, because both US and Japanese exporters set the price in producers' currency.

Again, Devereux and Engel (2020), investigate the choice of exchange-rate regime – fixed or floating in a dynamic, inter-temporal general equilibrium framework. They used an extended Devereux and Engel (1998) framework to investigating the implications of internationalized production. They examine the role of price setting – whether prices are set in the currency of producers or the currency of consumers – in determining the optimality of exchange-rate regimes in an environment of uncertainty created by monetary shocks. They find that when prices are set in producers' currencies, floating exchange rates are preferred when the country is large enough, or not too risk averse. On the other hand, floating exchange rates are always preferred when prices are set in consumers' currencies because floating exchange rates allow domestic consumption to be insulated from foreign monetary shocks. The gains from floating exchange rates are greater when there is internationalized production in this case.

Amartya, Rajesh and Carlos (2022), revisits the issue of the optimal exchange rate regime in a flexible price environment. The key innovation is that he analyze the question in the context of environments where only a fraction of agents participate in asset market transactions (i.e., asset markets are segmented). He shows that flexible exchange rates are optimal under monetary shocks and fixed exchange rates are optimal under real shocks. These findings are the exact opposite of the standard Mundellian prescription derived under the sticky price paradigm wherein fixed exchange rates are optimal if monetary shocks dominate while flexible rates are optimal if shocks are mostly real. This result thus suggests that the optimal exchange rate regime should depend not only on the type of shock (monetary versus real) but also on the type of friction (goods market friction versus financial market friction).

Chuka (2021), shows in his study of optimal exchange rate determination that there is no such thing as "the" optimal or best exchange rate policy. It all depends on the underlying fundamentals, which may be both domestic and external, as well as perceptions of policy credibility. How countries react to them will not be the same at all. Floating the currency would, of course, be deemed to be better than the other approaches but questions need to be answered as to, among others,

whether the country has sufficient reserves to intervene in the market at all times when it is necessary. In the case of Malawi, this has proved to be very difficult since the availability of foreign exchange is highly seasonal. He concludes that Malawi also faces another problem in that public confidence in the floating regime is taking rather long to stabilize with the consequence that the kwacha is constantly under speculative attacks.

Kildegaard (2021), examines the role of structural factors in Mexican real exchange rate experience since 1970, particularly in the crisis of December, 1994. He finds that fundamental determinants of the real exchange-omitted from previous research are co integrated with nominal exchange rates and relative prices, while tests of PPP alone fail. The co integrating equation indicates a severe undervaluation during the 1980s and only modest overvaluation in the period immediately preceding the devaluation in December, 1994. The author concludes that nothing in the fundamentals can account for magnitude of the blow Mexico suffered at that time.

Methodology

Research Design

This study adopts descriptive research. According to Best and Kahn (1989), descriptive research is the type of enquiring that deals with the collection and analysis of data for the purposes of describing and interpreting existing conditions. The study adopted the historical research method which interprets past trends of attitude, events and facts. The data used is therefore viewed with historical perspective in order to gain a clearer perspective of the present situation of current problems.

Analytical Procedure

The econometrics analysis applied involves the following processes.

1. Specification of the model
2. Model estimation
3. Evaluation of the estimates
4. Evolution of the forecasting power of the estimated model.
5. Analysis of the causal relationship

Data Collection Method

The secondary or times series data used for the study were sought on money supply, exchange rate, interest rate, inflation and real GDP performance from 2001-2022 through Central Bank of Nigeria and the National Bureau of statistics.

Model Specification

The research techniques postulate a function to capture the objectives as follows:

$RGDP = f(MS, INTR, INFR, EXR)$ ……..(1)

The mathematical model is specified as:

$RGDP = \beta_0 + \beta_1 MS + \beta_2 INTR_2 + \beta_3 INFR + \beta_4 EXR$ ……..(2)

The econometric form of the models are specified as: $RGDP = \beta_0 + \beta_1 MS + \beta_2 INTR_2 + \beta_3 INFR + \beta_4 EXR + \mu t$ …… ……..(3)

Where:

MS = Money supply

INTR= Interest rate

INFR = Inflation rate

EXR = Exchange rate

RGDP= Real Gross Domestic Product

μt = Stochastic term
β0 = Intercept term
β1, β2, β3 and β4 are partial slopes or parameters
A-priori expectation β1> 0,β2<0, β3<0, β4>0

Analytical Technique

The ordinary least square (OLS) method was used to analyse the data used and investigate the impact of exchange rate fluctuation economic growth in Nigeria, proxied by real GDP growth rate, while exchange rate fluctuation is proxied by money supply, inflation rate, interest rate and exchange rate movement. Regression models were adopted to determine the exact effect of exchange rate fluctuation on real GDP in Nigeria. Also applied were the granger causality test as well as the Co-efficient of determination (R^2), t – statistic and f-statistic tests to determine the explanatory power of the independent variables, significant of the estimated parameters in the regression model and the entire model.

Data Analysis and Interpretation of Results

This section shows data analysis and interpretation of result or discussion of findings. The table below presents the regression coefficients, standard errors, t-statistic, probability, R-square, adjusted R-square, F-statistic and Durbin – Watson, of the following variables: Real Gross Domestic Product (RGDP), inflation rate (INFR) Interest Rate (INTR), Money Supply(MS) and Exchange Rate (EXR).

Table 1: Summary of Regression Statistics, Real GDP versus Inflation Rate, Interest Rate, Money Supply and Exchange Rate Movements

Variable	Coefficient	Standard Error	t-Statistics	Sig t Value
C	40.51169	4.661438	8.690814	0.0000
MS	20.06069	0.262139	6.167583	0.0052
INTR	-0.051554	0.083659	-0.616237	-0.5427
INFR	-0.063314	0.063209	-1,001652	-0.3251
EXR	32.55432	1.632000	6.732021	0.0035

R-squared	0.864887	Mean dependent var	45.78125
Adjusted R-squared	0.735303	S.D. dependent var	4.978045
S.E. of regression	5.065153	Akaike info criterion	6.199114
Sum squared resid	718.3617	Schwarz criterion	6.382331
Log likelihood	-95.18583	Hannan-Quinn criter.	6.259846
F-statistic	5.647639	Durbin-Watson stat	1.941679
Prob(F-statistic)	0.001011		

Source: E-view 9 Data Computation from the Authors

RGDP = 40.51169 + 20.06069MS + (-0.051554)INTR + (-0.063314)INFR + 32.55432EXR + E_t

Sig t = (0.0000) (0.0052) (-0.5427) (-0.3251) (0.0035)

R^2 = 0.8648
Adj R^2 = 0.7353
Prob f = 0.001
Durbin Watson statistics = 1.941

The estimate of β_0 is 40.51169. This implies that if all independent variables are held constant, the dependent variable, economic growth will grow by 40.51169 points.

The estimate of β_1 is 20.06069. This shows there is a positive relationship between Money Supply (MS) and economic growth. This further implies that increase in money supply (MS) will bring about an increase in economic growth, for every unit change in Money Supply (MS), it will bring about 20.06069 points in economic growth. This is line with the stated aproiri.

The estimate of β_2 is -0.051554. There is an indirect or negative relationship between Interest Rate (INTR) and economic growth. A unit change in Interest Rate (INTR) will bring about -0.051554 points in economic growth. This is line with the stated aproiri.

The estimate of β_3 is -0.063314. This means there is an inverse relationship between Inflation rate (INFR) and economic growth. This further implies that a unit increase in Inflation rate (INFR) will bring about -0.063314 points in economic growth. This is line with the stated aproiri.

The estimate of β_4 is 32.55432. This means there is a positive relationship between exchange rate (EXR) and economic growth. This further implies that a unit increase in exchange rate (EXR) will bring about 32.55432 points in economic growth. This is line with the stated aproiri.

The results of statistical tools revealed that the coefficient of determination (R^2) is used to measure the success of the regression in predicting the value of the dependent variable economic growth within the sample and tests the goodness of fit, is considered high in this study over 86% while 24% was taken care by stochastic error, showing that the model was a good one. The adjusted R-square, the Durbin-Watson Statistic and the entire regression tests are statistically significant including the F-test. All results were obtained empirically and the test was conducted at five (5%) percent level of significance.

From the above results the sig f value falls under the threshold of 0.05 at a given value of 0.001. This indicates that the data used for the analysis are reliable and the regression line is properly fitted

The DW- statistic is 1.9. From the statistical table at 5% level of significance shows that there is absence of autocorrelation.

Analysis of the Regression Coefficient

The regression coefficient for the intercept shows a value of 40.51169, indicating that the intercept has a huge effect on economic growth.

Money supply has a regression coefficient value of 20.06069 indication

that its effect on economic growth is positive and huge. Since money supply has a large coefficient among the variables, its impact on the economy remains huge.

Interest rate has coefficient magnitude of -0.051554 This implies that interest rate has a little but adverse effect on economic growth.

Inflation rate has coefficient magnitude of -0.331406 which indicates that inflation has little and adverse effect on economic growth in this study.

Exchange rate has a regression coefficient value of 32.55432 indication that its effect on economic growth is positive and huge. Since exchange rate has the largest coefficient among the variables, its impact on the economy remains the largest.

Analysis of Standard Errors

The standard error for the intercept has the highest value of 4.661438 indicating its unreliability to predict the behavior of economic growth.

The standard error for money supply has a low value of 0,262139 indicating its reliability to predict the behavior of economic growth.

The standard error of interest rate has low a magnitude of 0.083659 indicating its reliability in predicting the behavior of economic growth.

Inflation rate has a standard error magnitude of 0.063209 indicating its high reliability in predicting the behavior of economic growth.

Exchange rate has a standard error magnitude of 1.632000, also indicating reliability in predicting the behavior of economic growth.

Test of Hypotheses

Null Hypothesis (Ho) One:

Ho_1: Money supply has no significant effect on economic growth in Nigeria.

Decision Rule: Accept the null hypotheses if the (sig) t-Statistic is above the threshold of 0.05 significant level.

From the above result, we reject the null hypothesis and accept the alternative which states that money supply has significant effect on economic growth in Nigeria as the significant t value of 0.0052 is below the threshold of 0.05.

Null Hypothesis (Ho) Two:

Ho_2: Interest rate has no significant effect on economic growth in Nigeria

Decision Rule: Accept the null hypotheses if the (sig) t-Statistic is above the threshold of 0.05 significant level.

From the above result, the null hypothesis is accepted and the alternative which states that interest rate has significant effect on economic growth in Nigeria is rejected as the significant t value of 0.5427 is above the threshold of 0.05.

Null Hypothesis (Ho) Three:

Ho_3: Inflation rate has no significant effect on economic growth in Nigeria.

Decision Rule: Accept the null hypotheses if the (sig) t-Statistic is above the threshold of 0.05 significant level.

From the above result, the alternative hypothesis is rejected and the null which states that inflation rate has no significant effect on economic growth in Nigeria is accepted as the significant t value of 0.3251 is above the threshold of 0.05.

Null Hypothesis (Ho) Four:

Ho_3: Exchange rate has no significant effect on economic growth in Nigeria.

Decision Rule: Accept the null hypotheses if the (sig) t-Statistic is above the threshold of 0.05 significant level.

From the above result, the null hypothesis is rejected and the alternative which states that exchange rate has a significant effect on economic growth in Nigeria is accepted as the significant t value of 0.035 is below the threshold of 0.05.

Analysis of the Causal Relationship

Table 2: Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
RGDP does not Granger Cause EXR	22	4.00035	0.0097
EXR does not Granger Cause RGDP		0.56887	0.5733
INFR does not Granger Cause RGDP	22	3.22764	0.0380
RGDP does not Granger Cause INFR		3.46213	0.0209
MS does not Granger Cause INTR	22	0.09164	0.9127
INTR does not Granger Cause MS		0.36354	0.6988
INTR does not Granger Cause INFR	22	2.91014	0.0491
INFR does not Granger Cause INTR		1.31982	0.2852
MS does not Granger Cause INFR	22	3.62809	0.0414
INFR does not Granger Cause MS		0.04151	0.9594
MS does not Granger Cause EXR	22	1.20564	0.3163
EXR does not Granger Cause MS		0.41672	0.6637
RGDP does not Granger Cause MS	22	0.00035	0.9997
MS does not Granger Cause RGDP		3.50017	0.0133
INTR does not Granger Cause RGDP	22	0.22764	0.7980
RGDP does not Granger Cause INTR		3.46663	0.0209
EXR does not Granger Cause INTR	22	0.09004	0.9117

Source: E-Views 9 output

There is a bidirectional causality between INFR and RGDP. There is however a unidirectional causality between RGDP and EXR; INTR and INFR; MS and INFR; RGDP and MS; RGDP and INTR. There is no causality between MS and INTR; MS and EXR; INTR and EXR; INFR and EXR.

Discussion of Findings

The result of the study shows that money supply relates significantly and positively with real GDP and economic growth which implies that an increase in money supply will boost the nation's real GDP/economy and vice versa. The result of the study agrees with the study of Cooper (1998), who reviewed twenty – four fluctuation experiences in money supply involving nineteen different developing countries during the period 1990 – 1996 and found rising economic output among the affected countries. Also, Agenor (2015), in his study of twenty three developing countries observed similar findings.

Also, the result shows interest rate to be significantly but negatively related to economic growth/real GDP. Which implies that a rise in inflation will impact negatively on the economy. Benita and Lauterbach (2017), in their study of the impact of rising interest rate on South East Asian economies from 2001 – 2015 arrived at similar findings. Kevin, Roland and Sashana (2022) in their study of the effect of macroeconomic variables on real GDP in the Caribbean observed similar findings.

Inflation is not significantly related to real GDP/economic growth in the study. This is contrary to the findings of the study carried out by Abu (2018), on the impact of exchange rate on economic growth in Nigeria. However, the result of the study carried by Dumba and Tinhumbu (2021), on East African Economie agrees with the findings of the study.

Also, the result shows exchange rate to be significantly and positively related to economic growth/real GDP. Which implies that an appreciation in exchange rate will impact positively on the economy. This agrees with the findings of the study carried out by Abu (2018), on the impact of exchange rate on economic growth in Nigeria.

Conclusion

The study shows that the regressors account for 84% behavior of the regressand and therefore very important and significant in chanting the course of economic growth in the country. The general conclusion is that money supply and exchange rate have significantly impacted on economic growth in Nigeria.

Recommendations

Based on the following findings of this study, the following policy recommendations are suggested.

i. The monetary authority should ensure adequate money supply while they keep an eye on inflation to ensure stable economic growth.

ii. The monetary authority through CBN should reduce interest guarantee a stable economic growth/exchange rate.

iii. Nigeria Monetary authority should device a suitable inflation rate that can directly impact on the country's economy.

iv. The authorities should evolve an exchange rate policy that is aimed at encouraging economic growth domestically, stabilizing exchange rate and promoting exports.

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