EFFECT OF FOREIGN EXCHANGE AND INTEREST RATES ON ECONOMIC GROWTH IN NIGERIA

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Abstract

The study investigated effects of foreign exchange and interest rates on economic growth in Nigeria from 1991 to 2020 (periods of regulation and deregulation in Nigeria). Secondary data used for the study were sourced from Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics (NBS). Ordinary Least Square (OLS) regression technique was used to analyze the data used for the study. Empirical result indicated that foreign exchange rate had a positive and insignificant impact on economic growth in Nigeria, while interest rate had a positive and significant impact on economic growth in Nigeria within the period covered by the study. The findings from this study also showed that both the foreign exchange and interest rates explained about 97% of the variation in the Nigerian economic growth. The study therefore recommends that high dependence on import needs to be discouraged in order to reduce the pressure on foreign exchange. Government should also create conducive environment and infrastructural facilities that will attract foreign direct investment (FDI) into export-oriented sector that will earn foreign exchange for the country. Lastly, the study recommends that monetary authorities should design and implement interest rate policies that will promote and stimulate economic growth.

Keywords: Foreign exchange rate, interest rate, monetary policy, gross domestic product (GDP), economic growth.

Introduction

Achievement of rapid economic growth is the main target of macroeconomic policies of any nation. Economic growth represents the expansion of a country's gross domestic product (GDP) or output. Cvetanovic Mitrovic and Jurakie (2019), defined economic growth as the increase in value of a country's production over time. According to them, the level of growth that a country can attain depends on its ability and capacity to accumulate the direct factors of production and invest the factors of production in knowledge acquisition.

Olu and Idih (2015) stated that economic growth is the quantitative increase in the monetary value of goods and services produced in an economy in a given time period which is usually a year. Economic growth of a country may be considered using gross domestic product (GDP) of the economy. If the GDP of economy increases, the country's economic growth is considered increased.

Oladipupo (2011) defined foreign exchange rate as the price of one currency (the domestic currency) in terms of another (the foreign currency). If the foreign exchange rate is well managed, it will be a useful approach for domestic price stability (Ehikioya, 2019). Foreign exchange rate has been of great value and sensitive in an economy. The sensitiveness of foreign exchange rate increases when it is determined incorrectly. This makes decision making policy of determining foreign exchange rate to be crucial matter and in that respect, any type of mistake has to be avoided. The concerns for achievement of a realistic foreign exchange rate for the naira have continued to generate a great instigation to monetary policy formulators in Nigeria owing to its unarguable significance in bringing about economic growth (Obisesan, Ogunsanwo & Akosile, 2019). Odoko (2009) described foreign exchange as a monetary asset used on a day-to-day basis to make international transactions and to finance deficits in a country's balance of payments.

There are two foreign exchange rate regimes namely, fixed exchange and floating exchange rate regimes. Fixed exchange rate as the name implies does not change unless the monetary authorities deliberately change it, while floating exchange rate system or flexible exchange rate system is one in which the exchange rate at any time is determined by the interactions of the market forces of supply and demand for foreign exchange (Okonkwo & Ezeji, 2016). Usually, the higher the level of economic and financial development, the more feasible is a flexible regime. On the other hand, the greater the degree of capital mobility, the more difficult it is to sustain a pegged but adjustable exchange rate (Omotola, 2016).

Nigeria changed its exchange rate policy from regulated to deregulated regime in 1986 in order to preserve the value of domestic currency (naira), maintain a favourable external reserve position and ensure external balance without compromising the need for internal and the overall goal of macroeconomic stability (Owolabi & Adegbite, 2012). Structural Adjustment Programme was introduced in Nigeria in September 1986 in order to find a realistic exchange rate of naira (Nigerian currency) to foreign currencies.

Interest rate refers to borrower's cost on a loan and the lender's reward on investment which manufacturing sector applied to increase its manufacturing output and capacity utilization (Opunsunju, Akyuz & Santeli, 2019). Interest rate can be used as an instrument of control by the monetary authority. Interest rate can be used as an instrument of monetary policy to reduce the cost of government borrowing or making credit for the private sector more costly. If interest rate is reviewed upward, it is to reduce amount of credit to the private sector or reduce the number of liquidity in circulation as people will not borrow when interest rate is high. On the other hand, low interest rate will induce borrowing and the amount borrowed will be used in productive activities, this will increase production and enhance economic growth of the nation. Interest rate can also be used to promote growth of the capital and money market (Usman, 2001). Interest rate is determined by expected inflation rates, level of government borrowing and efficiency of the banking sector (Khan & Satter, 2014).

Nigeria embarked on financial sector reform with the introduction of Structural Adjustment Programme (SAP) in September 1986 when exchange and interest rates were deregulated. Despite this deregulation, the effect is not fully felt on economic growth in Nigeria. It is as a result of this, the researchers are of the view that a research needs to be conducted on the effect of foreign exchange

and interest rates on economic growth in order to find lasting solutions to the problems. The objective of this paper is to determine whether exchange and interest rates policies adopted in Nigeria between 1991 and 2020 have effect on economic growth.

Based on the objective of this research, the following research hypotheses are formulated:

$H0_1$: Foreign exchange rate has no significant effect on economic growth in Nigeria.

$H0_2$: Interest rate has no significant effect on economic growth in Nigeria.

Literature Review

Conceptual Review

Exchange Rate

Foreign exchange rate is the price of one currency in terms of another. It is the amount of the foreign currency that will be purchased in terms of domestic currency. In Nigeria, foreign exchange rate management is the sole responsibility of Central Bank of Nigeria. Nigeria practiced fixed exchange rate system from independence in 1960 up to 1986 when local currency in foreign currencies was administratively fixed by the Central Bank of Nigeria. From September 1986 the naira was floated under Second-tier Foreign Exchange Market (SFEM) (Azeez, Kolapo & Ajayi, 2012).

Foreign exchange rate is the value of a foreign nation's currency in terms of the home nation's currency. An appropriate exchange rate has been one of the most important factors for economic growth in the economies of most developed countries, whereas regular fluctuations or inappropriate foreign exchange rate has been the greatest obstacle to economic growth of many African countries of which Nigeria is inclusive (Ishola, Oluwafunke, Victor & Asaleye, 2016).

Appropriate foreign exchange rate policy is a major determinant in the efficient allocation and utilization of scarce resources to enhance the flow of capital into a country, stimulating domestic industrial production, promotion of export, create a surplus purchasing power, balance of payment surplus, build up external reserve and enable a local manufacturer to compete with foreign counterpart (Lawal, 2016).

Akpan and Atan (2011) asserted that foreign exchange rate movements engender inflation and that there is some association between foreign exchange rate movements and economic growth of a nation.

Interest Rate

A research work of the Central Bank of Nigeria (CBN) in 2016 defines interest rate as the rental payments for the use of credit by borrowers and return for parting with liquidity by lenders over a time period. Interest rate serves as a vehicle for financial intermediation in the economy, it guides the flow of funds from savers to borrowers, it reflects the time value of money and it is also used by the Central Bank of Nigeria as a policy tool to determine the supply and cost of money in the economy. Before global financial crises in 2007 to 2008, economists and most of the Central banks believed that interest rate can be safely used as a policy tool to control money supply and accelerate economic growth.

All prominent economists either belonging to the classical, Neoclassical, Keynesian, Monetarist, Neo-classical, Neo-Wicksellian and even post-Keynesian economist believe that lower interest rate stimulate economic growth (Lee & Werner, 2018). However, after the global financial crises, use of interest rate as a policy tool becomes ambiguous. Continuous decrease in interest rate could not stimulate economic growth in most countries affected by global financial crises (Onwusu & Odhiambo, 2014).

Although, the relationship between interest rate and economic growth is highly

explored area of monetary economics, yet, economists could not reach concrete conclusion. There are two main strands of literature: first Keynesian view, that higher interest rate lowers investment and hence growth and the second Mckinon-shaw hypothesis stipulates that increase in interest rate improves the efficiency of investment and accelerate economic growth (Ali, Saifullah and Kari, 2015).

Types of Interest Rate

There are various types of interest rate, some of which are discussed below:

i) **Monetary Policy Rate (MPR):** This is the rate at which Central Bank lends to deposit money banks (DMBs) in performing their duties as the lender of last resort. It is usually set at a level that is consistent with the objectives of price stability. Monetary policy rate acts as a guide to all other market interest rates. Monetary policy rate is usually set with a corridor in which the upper bound represents the CBN lending rates to DMBs under the standing lending facility (SLF), and the lower bound represents the deposit rate at which the CBN accepts deposits from DMBs under the Standing Deposit Facility (SDF), (CBN, 2016).

ii) **Deposit Rate:** This is the interest rate financial institutions pay on deposit made with them. It is the interest rate deposit money banks pay on savings and fixed deposit accounts for the time period of the deposit. In essence, the deposit rate is the interest banks pay the depositors for the use of their money for the period that the money is deposited with the deposit money banks (Akintola & Adedire, 2020).

iii) **Prime Lending Rate:** Prime lending rate is simply defined as the interest rate which deposit money banks (DMBs) charged their most credit-worthy customers which are usually large organizations. All deposit money banks have prime lending rate which the minimum rate is charged on lending to their credit-worthy customers. Prime lending rate could also form the basis for other lending rates on mortgages, personal loans, and also loans to small businesses (Adegbite, Akintola & Adedire, 2020). Prime lending rate is used as the interest rate for this study.

Economic Growth

Economic growth is the increase in per-capital income of an individual in the economy (Utile, Okwori & Ikpambese, 2018). Economic growth can also be defined as an increase of gross domestic product (GDP), gross national product (GNP) and national income (NI), and by extension, the national wealth, including the production capacity, expressed in both absolute and relative size, per capital, encompassing also the structural modifications of the economy (Haller, 2012). The economic growth models posit that stable exchange rates may result in lower inflation rates, increased trade and investment, which in turn may boost productivity and economic growth (Ehikioya, 2019).

Foreign exchange rate has an important influence on economic growth. A strong foreign exchange rates (the home currency appreciating over foreign currency), will lead to export being expensive. The demand for the country's goods and services by other countries will decrease leading to decrease in the quantity of goods and services produced in the country. This will result in negative economic growth. If the foreign exchange rate is weak (the foreign currency appreciating over home currency), it will make exported goods and services cheaper at the international market, this will lead to increase in demand for the home country's goods and

services. As demand for goods and services increase, production will increase. This invariably leads to a positive economic growth (Okonkwo, Ujumadu & Osu, 2017).

Effective interest rate policy supports accelerated economic growth (GDP) of any country. The main objective of any government is to ensure economic growth through the implementation of effective interest rate policy. The impact of high cost of interest rate in the society is not unconnected to the fact the borrowers may hesitate to borrow when they should. This may be because the cost of credit and credit itself may aggregate to an amount that may be difficult for the borrower to repay with the stipulated due date of the facility. This will have negative effect on the economy. The gross domestic product (GDP) of the economy would be low since equity financing (shareholders' fund) cannot adequately sponsor the production activities in an economy (Cole & Akintola, 2021).

Interest rate is the price of capital to the borrower and a return on capital to the saver or lender. As an instrument of monetary policy, it can be used to combat inflation, ease budget burden, promote capital inflow and discourage capital flight, as well as avoid misallocation of resources. Interest rate can be used to growth of capital and money market in an economy (Akintola, Soetan, Ogundipe, Fasola, Adesanya & Olurin, 2021).

Keynesian stated that the higher the interest rate, the lower the investment and hence economic growth. While Mckinon-Shaw hypothesis postulates that increase in interest rate improves the efficiency of investment and accelerate economic growth (Gul, Mughal & Rahim, 2012).

Theoretical Review

Financial Liberalization Theory

The theory was propounded by Mckinon and Shaw in 1973. The theory is based on the assumptions that any distortion and limitation on the financial system, such as interest rate controls, reserve and liquidity requirement and government rationing of available credit to so-called priority sectors, inhibit financial development mainly by depressing interest rate (Olaniyan, Adegboyo, Owoniya & Alaketu, 2020).

The deficiency in the amount of savings due to such repressive measures thwarts economic development through the perverse effects on the volume and the quantity of investment. Thus, the main argument of Mckinon and Shaw is that financial repression has a detrimental effect on financial development, hence on performance of financial institutions.

In support of this theory, Mahendra (2013), Tajudeen, Taofeek and Abdul-Ganiu (2017) emphasized that high interest rate policy will stimulate savings and investment which will lead to financial deepening and ultimately economic growth.

Critics of this theory such as Owusu (2012), Stiglitz and Weiss (2003) challenged Mckinon and Shaw theory and contended that financial liberalization might nurture financial crisis. They also contended that the policy of low interest rate was considered important avenue for promoting investment by keeping the interest costs low.

In relevance to this study, the theory opined that financial liberalization theory depends on real income and real interest rate. Also, the theory emphasized that productive investment and capital accumulation occurs because large real money stock makes greater amount of loanable funds available to borrowers which in turn enhance production of goods and services.

Purchasing Power Parity Theory (PPP)

The Purchasing Power Parity theory was propounded by Professor Gustav of Salamanca School in Spain in the sixteenth century. The Purchasing Power Parity (PPP) theorem describes the connection between relative prices of goods and exchange rates (Majumder, Ray & Sinnha, 2015). The assumptions for PPP to hold are that goods are identical; all goods are tradeable; there are no transportation costs; information gaps, taxes, tariffs or restrictions of trade, and exchange rates are influenced only by relative inflation rates (Jiang, Bahmani-Oskooee & Chang, 2015). Due to these restrictive assumptions and empirical violation of the law of one price which is the building block of PPP, monetary models of exchange rate determination were adopted.

Purchasing Power Parity theory is grounded on the law of one price where the cost of a particular product should be identical in every country. In other words, holding all things constant, if a particular good is sold at one (1) dollar in the United States of America (USA), and the same commodity is sold for 100 naira in Nigeria, then the exchange rate has to be 100 naira per dollar. Based on this theory, if after exchange rate adjustment, there is a large difference in the prices of the same commodity in two countries; the opportunity for arbitrage is created.

In support of the purchasing power parity theory, Soon, Baharumshah and Ahn (2015); Ebiringa and Anyaogun (2014) asserted that the PPP aids as a standard for figuring the rate of equilibrium exchange and evaluating whether the real exchange rate stock diminish within some time. Tadesse (2009) criticized the purchasing power parity on the ground that the law of one price is unrealistic.

International Fisher Effect Theory

The theory was authored by Irving fisher in 1930. The International Fisher Effect is the international counterpart of the Fisher Effect.

The International Fisher Effect is based on the assumption that the changes in the spot rate of exchange between two currencies will be equal to the differences in their nominal interest rates. For example, a rise in the Swedish inflation rate relative to the United States will cause a depreciation of the Swedish krone relative to the United States nominal interest. The adjustment of the exchange rate to nominal interest differentials between countries can come about either directly through the flow of capital across international money markets or through some sort of activity between the goods and money markets, some real sector-border investment activity, or change in trade patterns in the goods market (Kane & Rosental, 2012).

Thus, investors speculating on the future spot rate interested in making profit would move the capital from countries with low-interest rates to countries with high interest rates. This movement of capital would ultimately cause a movement in the exchange rate, eliminating all profit opportunities. The movement in the exchange rate should on average offset the nominal interest differentials (Arize, Malindretos & Ghosh, 2015).

In support of the International Fishers Effect theory, Lagat and Nyandeme (2016) noted that the International Fisher Effect theory expands on the Fisher Effect, suggesting that because nominal interest rates reflect anticipated inflation rates and currency exchange rate changes are driven by inflation rates, then currency changes are proportionate to the difference between the two nations' nominal interest rate.

The international Fisher Effect has been criticized on the basis that it is applicable in the long run because average annual deviation as a measure for long-term validity tends

towards zero. The maximum yearly aberration was however too large to support the theory in the short-run (Robinson & Warburton, 2008).

Financial Intermediation Theory

The financial intermediation theory was developed by Gurley and Shaw in 1960. The theory emphasized the roles of the financial intermediaries in the financial systems. The theory establishes that the contribution of intermediaries is to ensure steady flow of the funds from the surplus unit to the deficit units. The role of financial intermediaries is essential in that it ensures the growth of the economy through supply of financial commodities (Fama, 1980).

The financial intermediaries ensure the creation of a platform that enables transaction of different commodities. The financial intermediaries exist due to the market imperfections. As such, in perfect market situation, with no transaction or information costs, financial intermediaries would not have existed. Numerous financial markets are characterized by informational differences between buyers and sellers.

The financial intermediation theory is based on the assumption of the presence of informational asymmetry and the agency theory. In principle, the existence of financial intermediaries is explained by the existence of the following categories of factors: high cost of transaction, lack of complete information in useful time; and the method of regulation. In financial markets, information asymmetries are particularly pronounced. Investors tend to borrow with the collateral and entrepreneurs have inside information about their own investment seeking financing. It explains the importance of intermediation process of financial intermediaries in the economy as a whole (Agbemaya, 2016).

In support of the financial intermediary theory, Okpe (2013) emphasized that intermediaries eliminate the need for self-financing of investments. In particular, by providing liquidity, financial institutions permit risk adverse savers and entrepreneurs to hold deposits rather than liquid (but unproductive) assets. The funds obtained by financial institutions are then available for investment in productive capital. Hence, financial institutions should finance any positive net present value project if the cost of investment is below the expected returns.

The financial intermediation theory is criticized on the ground that it is heavily focused on the functions of financial institutions that are no longer crucial in mature financial systems. Also, the emphasis of financial intermediation theory on the role of intermediaries as reducing the frictions of transaction costs and asymmetric information is too strong; while these factors may once have been central to the role of intermediaries, they are increasingly less relevant (Scholten & Wensveen, 2003).

Loanable Funds Theory of Interest

Loanable funds theory of interest was propounded by Wicksell (1893). According to the theory, the rate of interest is the price of credit which is determined by the demand and supply of loanable funds. Loanable funds theory is based on the assumptions that: resources in the economy are fully utilized (Pal, 2018), also, prices are constant, and the nominal and real rate of interest is the same (David, 2018). The loanable funds theory has been put forward as the long run theory of rate of interest determination and is most applicable for explaining long term rates of interest. The theory gives an attempt at trying to identify the approximate causes of the rate of interest variations by analyzing the demand for and the supply of credit. The theory comes

from the belief that those who save decide between consumption in the future or now. Accordingly, in this theory, the factors determining the rate of interest is real savings and real investment demand (Froyen, 1996).

According to Evans and Marshall (2006), the demand for loanable funds on the part of the consumers is for the purchase of durable consumers' goods, lower rate of interest will induce them to borrow more. Hence, demand curve for loanable funds for consumption purposes is also downward sloping. Funds are also demanded for the purpose of hoarding them in liquid or idle cash balances. This is to satisfy their desire for liquidity preference. In support of this theory are Akarara and Eniekezimene (2018).

They stated that loanable funds theory is a comparative statics equilibrium model which uses demand and supply curves to get the equilibrium price; this price is the credit cost which is the interest rate represented by the variable "r". They stated further that the theory takes into consideration bank credit on the supply side and recognizes the role of hoarding of funds in liquid form as idle cash balances as a factor influencing demand for funds. Keynes (1936) has criticized loanable funds theory on the ground that the interest rate cannot be influenced by savings decision as these are consequences of the investment decisions and therefore, they cannot condition the supply of liquidity.

Framework of the Study

The study reviewed five (5) theories in the literature. These theories are: financial liberalization theory, purchasing power parity theory, international fisher effect theory, financial intermediation theory and loanable funds theory of interest. Considering foreign exchange and interest rates to economic growth in Nigeria, the study focused on financial liberalization theory and international fisher effect theory. This is because deregulation Nigeria adopted in 1987 have been having effect on both foreign exchange and money markets in Nigeria.

Empirical Review

Empirical Review of Foreign Exchange Rate on Economic Growth

Asher (2012) analyzed the impact of exchange rate fluctuation on the Nigerian economic growth for the period of 1980 to 2010. The result revealed that real exchange rate has a positive and significant effect on the economic growth. In support of the above statement, Azeez, Kolapo and Ajayi (2012) also analyzed the effect of exchange rate volatility on macroeconomic performance in Nigeria from 1986-2010. The study revealed that exchange rate is positively related to gross domestic product (economic growth).

Aghion, Bacchetta, Ranciere and Rogoff (2009) in their study found that the effect of exchange rate volatility, which is the aftermath of how well the economy is managed on real activity has positive and insignificant effect on economic growth.

Fapetu and Oloyede (2014) in another study on foreign exchange management and Nigerian economic growth found that although exchange rate was positively related to economic growth in Nigeria, they established that the relationship was not statistically significant. The same conclusion was arrived at in a study conducted by Adeniran, Yusuf and Adeyemi (2014) when they investigated impact of exchange rate fluctuation on the Nigerian economic growth. The result also revealed that exchange rate has positive but insignificant impact on economic growth in Nigeria.

In another study carried out by Adebiyi and Dauda (2009) with the use of Error Correction Model (ECM). They stated that trade liberalization promoted growth in the Nigerian industrial sector and stabilized the exchange rate market between 1970 and

2006. Their study established a positive and significant relationship between indexes of industrial production by 12.2 per cent. They stated further that the policy of deregulation introduced through Structural Adjustment Programme (SAP) in 1986, influenced positively on export through exchange rate depreciation.

In contrast to the above findings, Audu and Amagberi (2013) in their study on exchange fluctuation and inflation targeting in an open economy established a significant and negative relationship between exchange rate and economic growth in Nigeria.

Iheanachor and Ozegbe (2021) investigated consequences of exchange rate fluctuations in Nigeria's economic performance. Empirical result revealed that the exchange rate, net direct 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 the study established that excessive exchange rate fluctuations are detrimental to Nigeria's economic growth.

Empirical Review of Interest Rate on Economic Growth

Opusunju, Akyuz and Santeli (2021) examined the effect of interest rate on the growth of manufacturing sector in Nigeria from 1985 to 2015. Data used for the study were obtained from Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics. Unit root and simple regression analysis were used to analyze the data.

The study concluded that interest rate had positive and significant effect on growth of manufacturing sector in Nigeria. The study recommends that banks in Nigeria should charge low interest rate to enable the growth of manufacturing sector in Nigeria. In agreement with above statement, Osadume (2018) in their study, argued that interest rates should be business friendly and predictable in line with prevailing economic activities and dictates that relevant stakeholders should be consulted in arriving at appropriate monetary policy and interest rates.

Maiga (2017) studied the impact of interest rate on economic growth in Nigeria from 1990 to 2013. The result found that interest rate has a slight on economic growth, he however established that growth can be improved by reducing the interest rate which will increase the investment and that the Nigerian authorities should set interest rate policies that will boost the economic growth.

Idris (2019) studied the macroeconomic analysis of interest rate and economic growth in Nigeria from 1980 to 2017. The result shows there is existence of negative relationship between interest rate and economic growth in Nigeria. Ayunku and Etale (2016) examined the relationship between interest rate and economic growth in Nigeria from 1985 to 2014. The empirical result of the Error Correction Model (ECM) test showed that inflation and exchange rate exert positive influence on interest rate; while on the other hand, interest rate exerted a negative influence on economic growth in Nigeria.

Obansa, Okoroafor, Aluko and Eze (2013) in their study, concluded that exchange rate had a stronger impact on economic growth than interest rate.

Onyago (2014) in a study on the impact of real exchange rate volatility on economic growth in Kenya using the Ordinary Least Square (OLS) estimation technique found that exchange rate volatility positively impacts on gross domestic product growth but is not significant in affecting gross domestic product growth rate.

Lee, Kim and Kang (2016) in their research investigated how financial market

openness affects the exchange rate flexibility or exchange rate regime on economic growth. The study found that exchange rate flexibility has a negative effect on economic growth, but this effect varies with degree of financial market openness.

Fabian (2015) examined the impact of interest rate on investment in Nigeria. The study found that high interest rate works against investment as an increase in interest rate by 1% reduced investment by 14%. Thus, there exist on inverse relationship between investment and interest rate in Nigeria. Interest rate here is the prime lending rate. Considering the importance of investment in stimulating economic growth through diversification of the economy, job creation, and government should formulate policies that will improve investment.

Jelilov (2016) examined the impact of interest rate on economic growth in Nigeria from 1990 to 2013. The result found that the interest rate has a slight impact on economic growth. He argued that economic growth can be improved by lower interest rate which increases the investment. From the analysis carried out, the study concludes that in Nigeria the interest rate has significant impact on the economic growth.

Methodology

Ex-post facto research design was used in this study. Secondary data obtained from Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics from 1991 to 2020 was used for this study. The regression analysis based on the classical linear regression otherwise known as Ordinary Least Square (OLS) technique was used in the analysis of the data sourced for this study. Ordinary Least Square (OLS) technique has been chosen based on the fact that it is a method for estimating the unknown parameter in a linear regression model.

The data regressed covered the period from 1991 to 2020, a period of thirty (30) years. Econometric views (E-view) statistical software was used to run a multiple linear regression analysis of the model parameters. Foreign exchange and interest rates are the independent variables while nominal gross domestic product used as proxy for economic growth is the dependent variable.

Prime lending rate (PLR) is used as proxy for interest rate. Prime lending rate is chosen because it is from this rate that other interest rates are determined.

Model Specification

For the purpose of this research work, the model used for this study is stated in the equation below:

InNGDP = f(In EXR, In INTR) ……..
functional relationship

InNGDP = β_0 + β_1 In EXR + β_2 In INTR + μ …….. linear relationship

Where:

InNGDP = log of Nominal Gross Domestic Product as proxy for economic growth
InEXR = log of Foreign Exchange as proxy for foreign exchange rate
InINTR = log of prime lending rate as proxy for Interest Rate
β_0 = Interest
β_1, β_2 are partial slope coefficients of log EXR, log INTR
μ = Stochastic variable which is introduced to take care of the economic growth problems that are not included in the model of this research work.

This model is formulated to estimate the effects of foreign exchange and interest rates have on economic growth in Nigeria. In the linear relationship above, μ is the random term that absorbs all the errors of the model specification. It also denotes the influence of other variables not specified in the model.

Data Presentation and Analysis

Secondary data that have been gathered for this study were empirically analyzed with the help of Economic views (E-views 7) statistical software. This is to enable us obtain result that revealed the effects of foreign exchange and interest rates on economic growth in Nigeria for the period of the study which is 1991 to 2020. The estimated model from the regression result was evaluated based on theoretical statistical and economic criteria respectively.

Empirical Analysis

Multiple regression model specified under the methodology were estimated from the Ordinary Least Square (OLS) techniques. Based on the data presented in table 3 in the appendix B, the results in table 1 below were obtained.

Table 1 Regression Analysis Results

Variables	Coefficient	Standard Error	T-statistic	P-value
Constant	2.792915	0.182170	15.33135	0.0000
Log (EXR)	0.016117	0.050753	0.317562	0.7536
Log (INTR)	0.955090	0.040757	23.43360	0.0000

NGDP = 2.792915 + 0.016117EXR + 0.955090INTR

R-Square (R^2) 0.976386 Adjusted R^2 0.974419

Durbin Watson 0.743599 Prob. (F-statistic) 0.000000

S.E. of regression 0.280826

F-statistics 496.1800

Source: E view 7

Evaluation of the Model

The estimated model was evaluated based on the economic criteria which determined the theoretical plausibility of the model, statistical criteria using the coefficient of determination, standard error test and F-statistics.

Consistency of Estimates with Expectation

The estimated model shows that all the parameter estimates are consistent with the a priori theoretical expectations.

The coefficient β_1(0.016117) shows a positive relationship between exchange rate (EXR) and economic growth. Holding the influence of every other relevant variable constant, a 1% increase in Nigeria's exchange rate against the US dollar will bring about a 0.016% increase in the GDP.

This implies that an increase in exchange rate will make Nigeria's export to become cheaper abroad, this will increase revenue to be earned from export as demand for Nigeria goods will increase. This result is consistent with Aghion, Bacchetta, Ranciere and Rogoff (2009), Fapetu and Oloyede (2014). However, the finding of this study is different from that of Azeez, Kolapo and Ajayi (2012) and Asher (2012) who established a positive and significant relationship between exchange rate and economic growth.

Also, the study established a positive and significant relationship between interest rate and economic growth in Nigeria with coefficient of β_2 (0.955090) and P-value of 0.0000. This implies that holding the influence of every other relevant variable constant, a 1% in interest rate (INTR) will induce an increase in economic growth to about 0.96%. This result is consistent with the findings of Osadume (2018) and Opunsunju, Akyuz and Santeli (2021) who established positive and significant relationship between interest rate and economic growth in Nigeria.

Explanatory Power of the Model

P value of statistics is significant meaning that the model is fit for the study. From the regression result, coefficient of determination R^2adjusted which is 0.974419 indicates that about 97% of the total variation in the response variable (NGDP) can be explained by the causal variables (EXR and INTR). The remaining 2.4% of the total variation in NGDP is unexplained by the regression line, and this is accredited to the random variable μ, which accounts for factors not included in the constructed model of this research work.

Conclusion and Recommendations

This study examined the effects of foreign exchange and interest rates on economic growth in Nigeria from 1991 to 2020. Exchange and interest rates are of great concern for countries especially the developing countries of which Nigeria is inclusive. This study provides insightful evidence of the effects of foreign exchange and interest rates on economic growth in Nigeria. The study has come up with the conclusion and recommendations discussed below:

Conclusion

The study empirically examined effects of foreign exchange and interest rates on economic growth in Nigeria. This is against the backdrop that foreign exchange and interest rates are very crucial macroeconomic variables and economic growth is a measure of performance of an economy.

The study concluded that foreign exchange rate exerted a positive and insignificant effect on economic growth in Nigeria. In addition, the study also concluded that interest rate had a positive and significant effect on economic growth in Nigeria.

Recommendations

Based on the conclusion of this study, the following recommendations are made:

1. High dependence on import needs to be discouraged in order to reduce the pressure on foreign exchange. Government should encourage consumption of locally produced goods which are being imported.
2. Central Bank of Nigeria should design policy measures that promote the value of the naira and check exchange rate fluctuation. Policy measure should be put in place by monetary authority that would stabilize the foreign exchange market and the exchange rate.
3. The study recommends caution on the part of the government when adopting trade policies by ensuring that Nigeria does not create an unfavorable balance of trade with trading countries as this can impact significantly on foreign exchange.
4. A conducive environment and infrastructural facilities need to be put in place in order to attracted foreign direct investment (FDI) into export-oriented sector that will earn foreign exchange and enhance economic growth in Nigeria.
5. The study also recommends that monetary authorities should design and implement interest rate policies that will promote and stimulate economic growth in Nigeria.
6. Monetary policies that would create favorable investment climate by facilitating the emergence of market-based interest and exchange rate regimes that attract both domestic and foreign investments and revive industries that are operating below capacity utilization should be put in place. Little or no research have been

carried out on effect of both foreign exchange and interest rates on economic growth. Most researches used either exchange rate and economic growth or interest rate on economic growth. This study contributes to scarce literature on the joint effects of foreign exchange and interest rates on economic growth in Nigeria taking into consideration the fact that Nigeria is an import-oriented economy and government deregulation policy on foreign exchange and interest rates.

Contribution/Originality

The paper contributed in no small way to the body of knowledge and existing literature on exploring effect of foreign exchange and interest rates on economic growth in Nigeria from 1991 to 2020. The primary contribution of this study is that it shows the effect of foreign exchange and interest rates after the introduction of deregulation in the Nigerian foreign exchange and money markets.

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Appendix A: Table 2

Year	RGDP (N Million)	Exchange Rate	Prime Lending Rate
1991	328.64	9.9095	20.047
1992	337.29	17.2984	24.758
1993	342.54	22.0511	31.65
1994	354.23	21.8861	20.483
1995	352.65	21.8861	20.233
1996	367.22	21.8861	19.837
1997	377.83	21.8861	17.795
1998	388.47	21.8861	18.184
1999	393.11	92.6934	20.29
2000	412.33	102.1052	21.274
2001	431.78	111.9433	23.438
2002	451.79	120.9702	24.771
2003	495.01	129.3365	20.714
2004	527.58	113.5004	19.181
2005	561.93	132.147	17.948
2006	595.82	128.6516	16.893
2007	634.24	125.8331	16.939
2008	672.2	118.5669	15.136
2009	718.98	148.9017	18.991

2010	776.33	150.298	17.585
2011	834	158.8616	16.02
2012	888.89	157.4994	16.792
2013	950.11	157.3112	16.723
2014	987.52	158.5524	16.548
2015	992.55	192.44	16.849
2016	102.68	253.49	16.868
2017	145.05	305.79	17.553
2018	154.72	306.08	16.904
2019	135.62	307.01	15.40
2020	130.91	387.06	19.84

Source: CBN Statistical Bulletin various years
National Bureau of Statistics, Annual Report
Note: RGDP-Real Gross Domestic Product

Appendix B: Table 3

Dependent Variables LOG(GDP)
Method: Ordinary Least Squares
Date: 06/06/22
Sample: 1991-2020
Included observations: 30

Variables	**Coefficient**	**Standard Error**	**t-statistic**	**Prob.**
C	2.792915	0.182170	15.33135	0.0000
LOG(EXR)	0.016117	0.050753	0.317562	0.7536
LOG(INTR)	0.955090	0.040757	23.43360	0.0000
R-squared	0.976386	Mean dependent var		8.239035
Adjusted R-squared	0.974419	S.D dependent var		1.755795
S.E of regression	0.280826	Akaike info criterion		0.402274
Sum squared resid	1.892713	Schwarz criterion		0.546256
Log likelihood	-2.430697	Hannan-Quinn criter		0.445087
F-statistic	496.1800	Durbin-Watson stat		0.743599
Prob. (F-statistic)	0.000000			

Source: E-View 7