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RESEARCH ARTICLE

Navigating the Economic Labyrinth: The Minotaur of Exchange Rate in Nigeria's Maze

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ABSTRACT

The study was carried out to navigate the Economic Labyrinth: The Minotaur of Exchange Rate in Nigeria's Maze. The specific objectives are as follows, to ascertain the effect of Interest rate on exchange rate in Nigeria, to assess the effect of inflation rate on exchange rate in Nigeria and to examine the effect of money supply on exchange rate in Nigeria. The study used secondary sources of data from Central Bank of Nigeria Statistical bulletin. Ex-post facto research design was also adopted. The study employed Auto Regressive Distributed Lag Model (ARDL). The result revealed that Interest rate has negative and significant effect on real exchange rate in Nigeria. This result confirms the findings (t-statistics is -0.397241 while the probability value is 0.6940). Inflation rate has positive and non-significant effect on real exchange rate in Nigeria. This result confirms the findings (t-statistics is 1.088344 while the probability value is 0.2851). Money supply has negative and significant effect on real exchange rate in Nigeria. This result confirms the findings (t-statics is -0.539063 while the probability value is 0.5938). From the findings the following recommendations were made; The Central Bank of Nigeria needs to formulate monetary policy that will stabilize the Naira against other currency as well as allow such policy to complete their gestation period before subjecting them to change. One of the things that aid exchange rate misalignment is the frequent change of monetary policies, such changes could trigger shock in the fundamentals. Also, the government should stimulate the productive sector of the economy so that the Nigeria economic growth can sufficiently stimulate the appreciation of the Naira. A major policy implication of this result is that concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to boost the growth of the economy. Inflation can only be reduced to the barest minimum by increasing output level (GDP).

Keywords: Navigating the Economic Labyrinth; Macroeconomic Variables; Exchange Rate; Interest Rate; Inflation Rate

Introduction

The exchange rate is simply the value of the local currency of a country for the purpose of conversion to any another currency of other country. The exchange rate facilitates international trade for imports and exports. It is also use for the funds transfer among the countries. At the same time, exchange rate allows the prices comparison of goods and services for different countries i.e. the purchasing power parity PPP (Abdoh, 2016). For International trade and finance stability, the exchange rates always play an important role. The exchange rate is a very useful macroeconomic variable utilized as parameter for deciding the strength and position of economy of a country worldwide. The world is distributed into two major groupings of countries, known as developed and developing countries. The key economic and financial factors by which the classification perform for these countries are based on the gross domestic product (GDP growth), consumer price index (inflation), exchange rate, gross national product (GNP), industrial and manufacturing productions, living standards etc. Any country related to the exchange rate by means of development. A stable exchange rate can help undertaking and money related establishments in evaluating the execution of speculations, financing and supporting and accordingly decreasing their operational dangers (Samea, 2014).

Many macroeconomic variables such as GDP growth, interest rate, inflation, Industrial production, political stability, unemployment rate and treasury bills etc. have an impact on the exchange rate (Ramasamy and Abar, 2015). The macroeconomic indicators which usually used to forecast an exchange rate are similar to those which are usually used to evaluate the complete economic health of a country. The gross domestic product (GDP growth), consumer price index (inflation), producer price index (PPI), employment data and interest rates are all key determining factors for the exchange rates for any country.

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It is also noticed that the fluctuations in the exchange rate affects the development of private multinational organizations. Furthermore, it is also building a level of risk for money related foundations like banks, and trade related to the stock markets as well as firms. A brief literature suggests that the fluctuations in the exchange rate are mostly affected by the performance of the macroeconomic variables. Medura (2006) revealed that the fluctuations in the exchange rate are actually due to the variation in the demand and supply of many macroeconomic factors like GDP growth, interest rate, inflation, Industrial production, political stability, unemployment rate and treasury bills etc. Generally, the developing countries have higher imports as compare to the exports. Therefore, the exchange rate increases the purchasing cost by means of payments of products and other services from the well-developed countries (Abbas, 2012). After the financial insecurity in some of the distinctive countries, the fluctuation in the economy is same regarding the characteristics in currency. It has been observed that some countries ineffectively performed, throughout the previous couple of years. In these countries, the exchange rate is assumed to be an extremely important factor for the national financial circumstances.

A very significant macroeconomic factor is the interest rate. Interest rate is assumed a noteworthy part in exchange rate determination (Ramasamy & Abar, 2015). Bosworth (2014) disagrees with the role of interest rate in the economic growth. They described there is a very little relation between the economy growths with interest rate. However, Medura (2006) reveals that the interest rate is a very important factor which has an impact on the fluctuations of exchange rate. In this paper, we focused on the impact of macroeconomic factors such as consumer price index rate (inflation), gross domestic product (GDP growth) and interest rate on the exchange rate of developed and developing countries. To explore the impact on the exchange rate fluctuations, these macroeconomic variables are selected due to the inconclusive literature regarding the relationship with the exchange rate. Also, these three independent macroeconomic variables i.e., GDP growth, inflation and interest rate plays the key role in the determination of the economic health of any country and these variables are also used for many international forecasts. The aim of this study is to share in existing literature by navigating the economic labyrinth: the minotaur of exchange rate in Nigeria's Maze using three developed G7 countries and three emerging developing countries.

Statement of Problem

The state-society gap is one of the biggest problems of economic development in Nigeria. The government has drifted away from its citizens by concentrating on the wants and demands of foreign interests to secure financial support and investments. Foreign interests encourage the government to make minimal input into building institutions, policies, and strategies that can increase domestic taxation and other forms of revenue. As a result, the country relies heavily on funds from foreign entities to function. The West (and China) helps perpetuate this state-society gap by providing international aid or Official Development Assistance. Development consultants that accompany aid money also have an external orientation. They focus on the desires and wants of the foreign entities from which they came. These consultants influence or advise the government to focus on foreign priorities instead of its people's desires and wants. Consequently, this widens the gap between the government and its people.

Corruption is among the greatest threats to Nigeria's development. The country's 2030 Agenda for Sustainable Development aspires to get over 100 million Nigerians out of poverty. Nigeria's natural resources include petroleum, natural gas, tin, iron ore, coal, limestone, niobium, lead, zinc, and arable land. The country earns a considerable sum of money from these resources. For instance, Nigeria made about $47 billion from mineral fuels, oils, and distillation products in 2019. The amount was over 80% of the country's export value. The natural resources in Nigeria promote corruption and poverty instead of economic development - only a few pockets income from these resources, leaving millions impoverished. There are other forms of corruption in Nigeria. Nepotism and vote-buying have put corrupt leaders and workers in public offices. Hence, the standards of professionalism have deteriorated. Public officials solicit bribes, and citizens willingly initiate bribes in public and private offices. Citizens and officers who refuse and report bribes experience negative consequences. Therefore, this study wants to examine the Economic Labyrinth: The Minotaur of Exchange Rate in Nigeria's Maze.

Objectives of the Study

The broad objective of the study is on navigating the Economic Labyrinth: The Minotaur of Exchange Rate in Nigeria's Maze. The specific objectives are as follows:

i. To ascertain the effect of Interest rate on exchange rate in Nigeria
ii. To assess the effect of inflation rate on exchange rate in Nigeria
iii. To examine the effect of money supply on exchange rate in Nigeria

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Research Questions

i. To what extent does Interest rate affect exchange rate in Nigeria
ii. What is effect of inflation rate on exchange rate in Nigeria
iii. What is the effect of money supply on exchange rate in Nigeria

Research Hypotheses

i. Interest rate has positive and significant effect on real exchange rate in Nigeria
ii. Inflation rate has positive and significant effect on real exchange rate in Nigeria
iii. Money supply has positive and significant effect on real exchange rate in Nigeria

Scope of the Study

This study covered unstable macroeconomic indicators and real exchange rate in Nigeria from 1986-2021. The independent variable includes Interest rate, Money supply and Interest rate while dependent variable is real gross domestic product.

Review of Related Literature

Conceptual Review

Macro-Economic Variables

A macroeconomic factor is a pattern, characteristic, or condition that emanates from, or relates to, a larger aspect of an economy rather than to a particular population. The characteristic may be a significant economic, environmental, or geopolitical event that widely influences a regional or national economy. A macroeconomic factor can include something that affects the course or direction of a given large-scale economy. Monetary policies and other regulations, for example, can affect national and state economies, while also coming with potentially great global consequences. Inflation, gross domestic product (GDP), national income, and unemployment levels are examples of macroeconomic factors. Such economic performance metrics are closely tracked by states, companies, and consumers alike. The correlation between various macroeconomic factors is extensively researched in the field of macroeconomics.

Positive macroeconomic factors are comprised of events that ultimately stimulate economic stability and expansion within a country or a group of countries. Any development leading to a rise in demand for goods or services (e.g., a decrease in price) is considered a positive macroeconomic factor. As the demand for products and services grows, domestic and foreign suppliers of the products will inevitably benefit from increased revenues resulting from increased customer traffic. Higher profits will, in effect, grow stock prices on a larger scale. Negative macroeconomic factors include events that may threaten the national or global economy. Concerns of political uncertainty induced by the involvement of a nation in civil or global conflict are likely to worsen economic unrest due to the redistribution of resources or damage to property, assets, and livelihoods. Negative macroeconomic factors also include global pandemics (e.g., Covid-19) or natural disasters, such as hurricanes, earthquakes, flooding, wildfires, etc.

Interest Rate

Ibimodo (2015) defined interest rates, as the rental payment for the use of credit by borrowers and return for parting with liquidity by lenders. Like other prices interest rates perform a rationing function by allocating limited supply of credit among the many competing demands. Bernhardsen (2018) defined the interest rate as the real interest rate, at which inflation is stable and the production gap equals zero. That interest rate very often appears in monetary policy deliberations. However, Anyanwoncha (2020) states that interest rates are charged for a number of reasons, but one is to ensure that the creditor lowers his or her exposure to inflation. Inflation causes a nominal amount of money in the present to have less purchasing power in the future.

The concept of the interest rate refers to the interest rate levied by the banks on loans or deposits. (Faris & Syed, 2017). The interest rate charged on loan is a form of revenue for the bank and at the same time represent the cost borne by the customer for borrowing the money and is termed as credit interest, on the contrary, while interest rates on deposits is cost, the bank is expected to pay to the customers and at the same time represent a form of revenue earned by the customers in exchange for retaining deposits with banks, also termed as debt interest rate. The difference between the debt and credit interest rate from all banking activities are called interest rate spread

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(IRS). What determines the rate of interest is the credit risk, thus, if the credit risk is high the interest rate on loans is high in order to compensate for the size of this risk. It is also referred to the cost or price of borrowed funds for a period of time, based on the concept of present values the cash value goes down over time due to many factors, including the rate of inflation.

Anyanwaokoro (1999) submitted that interest rate is a price for money and credit. According to Keynes, interest rate is the reward for not hoarding but for parting with liquidity for a specific period of time. Keynes' definition of interest rate focuses more on the lending rate. Adebiyi (2017) defines interest rate as the return or yield on equity or opportunity cost of deferring current consumption into the future. Some examples of interest rate include the saving rate, lending rate, and the discount rate. Professor Lerner, in Jhingan (2020), defines interest as the price which equates the supply of 'Credit' or savings plus the net increase in the amount of money in the period, to the demand for credit or investment plus net 'hoarding' in the period. This definition implies that an interest rate is the price of credit which like other price is determined by the forces of demand and supply; in this case, the demand and supply of loanable funds.

Inflation Rate

Inflation is a rise in prices, which can be translated as the decline of purchasing power over time. The rate at which purchasing power drops can be reflected in the average price increase of a basket of selected goods and services over some period of time. The rise in prices, which is often expressed as a percentage, means that a unit of currency effectively buys less than it did in prior periods. Inflation can be contrasted with deflation, which occurs when prices decline and purchasing power increases. Inflation is the rate at which prices for goods and services rise. Inflation is sometimes classified into three types: demand-pull inflation, cost-push inflation, and built-in inflation. The most commonly used inflation indexes are the Consumer Price Index and the Wholesale Price Index. Inflation can be viewed positively or negatively depending on the individual viewpoint and rate of change. Those with tangible assets, like property or stocked commodities, may like to see some inflation as that raises the value of their assets.

Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country. But it can also be more narrowly calculated - for certain goods, such as food, or for services, such as a haircut, for example. Whatever the context, inflation represents how much more expensive the relevant set of goods and/or services has become over a certain period, most commonly a year. Consumers' cost of living depends on the prices of many goods and services and the share of each in the household budget. To measure the average consumer's cost of living, government agencies conduct household surveys to identify a basket of commonly purchased items and track over time the cost of purchasing this basket. (Housing expenses, including rent and mortgages, constitute the largest component of the consumer basket in the United States.) The cost of this basket at a given time expressed relative to a base year is the *consumer price index* (CPI), and the percentage change in the CPI over a certain period is *consumer price inflation,* the most widely used measure of inflation. (For example, if the base year CPI is 100 and the current CPI is 110, inflation is 10 percent over the period.). *Core consumer inflation* focuses on the underlying and persistent trends in inflation by excluding prices set by the government and the more volatile prices of products, such as food and energy, most affected by seasonal factors or temporary supply conditions. Core inflation is also watched closely by policymakers. Calculation of an overall inflation rate for a country, say, and not just for consumers requires an index with broader coverage, such as the *GDP deflator*.

Money Supply

Money supply is the sum total of all of the currency and other liquid assets in a country's economy on the date measured. The money supply includes all cash in circulation and all bank deposits that the account holder can easily convert to cash. Governments issue paper currency and coins through their central banks or treasuries, or a combination of both. In order to keep the economy stable, banking regulators increase or reduce the available money supply through policy changes and regulatory decisions. The money supply is the total amount of cash and cash equivalents such as savings accounts that is circulating in an economy at a given point in time. Variations of the money supply number take into account non-cash items like credit and loans. In the U.S., the Federal Reserve tracks the money supply from month to month. The Fed also influences the money supply, through actions that increase or decrease the amount of cash in the system. Monetarists, who view the money supply as the main driver of demand in an economy, believe that increasing the money supply leads to inflation.

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An increase in the supply of money typically lowers interest rates, which in turn, generates more investment and puts more money in the hands of consumers, thereby stimulating spending. Businesses respond by ordering more raw materials and increasing production. The increased business activity raises the demand for labor. The opposite can occur if the money supply falls or when its growth rate declines. Banks lend less, businesses put off new projects, and consumer demand for home mortgages and car loans declines. In macroeconomics, the money supply (or money stock) refers to the total volume of currency held by the public at a particular point in time. There are several ways to define "money", but standard measures usually include currency in circulation (i.e., physical cash) and demand deposits (depositors' easily accessed assets on the books of financial institutions). The central bank of a country may use a definition of what constitutes legal tender for its purposes. Money supply data is recorded and published, usually by a government agency or the central bank of the country. Public and private sector analysts monitor changes in the money supply because of the belief that such changes affect the price levels of securities, inflation, the exchange rates, and the business cycle. The relationship between money and prices has historically been associated with the quantity theory of money. There is some empirical evidence of a direct relationship between the growth of the money supply and long-term price inflation, at least for rapid increases in the amount of money in the economy. For example, a country such as Zimbabwe which saw extremely rapid increases in its money supply also saw extremely rapid increases in prices (hyperinflation). This is one reason for the reliance on monetary policy as a means of controlling inflation.

Exchange Rate

Exchange rate is the price of a country's money in relation to another country's money. An exchange rate is "fixed" when countries use gold or another agreed-upon standard, and each currency is worth a specific measure of the metal or other standard. An exchange rate is "floating" when supply and demand or speculation sets exchange rates (conversion units). If a country imports large quantities of goods, the demand will push up the exchange rate for that country, making the imported goods more expensive to buyers in that country. As the goods become more expensive, demand drops, and that country's money becomes cheaper in relation to other countries' money. Then the country's goods become cheaper to buyers abroad, demand rises, and exports from the country increase. An exchange rate is the rate at which one currency can be exchanged for another between nations or economic zones. It is used to determine the value of various currencies in relation to each other and is important in determining trade and capital flow dynamics.

Direct quotation of exchange rates involves quoting the price of a unit of foreign currency directly in terms of the number of units of domestic currency that are exchanged. Indirect quotation of exchange rates involves expressing the price of a domestic currency in terms of the number of units of foreign currency that are exchanged. Cross rates are a method of quoting exchange rates in which various foreign currency exchange rates are used to imply a domestic exchange rate, e.g., if you wanted to determine the EUR/USD exchange rate but can't access a direct quote. You could use the EUR/CAD exchange rate and the CAD/USD exchange rate to infer the EUR/USD rate. Exchange rates are defined as the price of one country's currency in relation to another. They may be expressed as the average rate for a period of time or as the rate at the end of the period. Exchange rates are classified by the International Monetary Fund (IMF) in three broad categories, reflecting the role of the authorities in the determination of the exchange rates and/or the multiplicity of exchange rates in a country.

Theoretical Review

Foreign Exchange Exposure Theory

Contemporary foreign exchange exposure theory (Buckley, 2000; Levi, 1996; Shapiro, 2003) is of the opinion that exchange rate fluctuations should affect the value of a multinational company mainly via foreign sales and foreign (net) assets, which have to be denominated in the domestic currency of the parent company. Despite that, the earliest empirical studies on the topic (Levi, 2009; Amihud, 2009; Jorion, 2010.), although focusing on banks with considerable operations abroad, fail to show a significant effect of fluctuations in exchange rates on the stock price of multinational banks.

More recent studies (Jongen et al., 2006; Gao, 2000; Bartov et al. 1996; Bodnar and Gentry, 1993), however, are more consistent with financial theory and find that exchange rate movements, through their effect on sales and net assets values, are an important factor in determining firm value.

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Purchasing Power Parity Theory

Purchasing power parity theory explains the determination of exchange rate and its fluctuations when the countries are on inconvertible paper standard. The theory was first propounded by Wheatlay in 1802, but the credit for properly developing the theory in the present form goes to Gustav Cassel who gave its systematic statement in 1918. The theory is based on the fundamental principle that the different currencies have purchasing powers in their respective countries. When the domestic currency is exchanged for the foreign currency, it is, in fact, the domestic purchasing power which is exchanged for the foreign purchasing power. Thus, the most important factor determining the exchange rate is the relative purchasing power of the two currencies. According to the purchasing power parity theory, under the system of inconvertible paper currency, the rate of exchange is determined by the relative purchasing powers of the two currencies in their respective countries.

Empirical Review

Siregar, Maulana, and Hasanah (2015) documented the effect of macroeconomic indicators such as inflation, production index, exchange rate, crude oil price, Jakarta stock index and Bank Indonesia rate on the performance of state-owned banks. The study employed a Vector Error Correction Model with empirical results reporting that the shock of Bank Indonesia's rate provided the largest response of most of the bank performance indicators. Simiyu (2015) also investigated the impact of macroeconomic variables on the profitability of commercial banks listed on the Nairobi Securities Exchange. In this study, panel data and fixed effect analysis was employed with empirical results revealing that exchange rates, GDP and interest rates do not significantly influence bank performance. On the contrary, Sheefeeni (2015) reported dissimilar results in that macroeconomic variables were found to significantly influence bank performance in Namibia. In the empirical study by Evans and Kiganda (2014) based on correlation analysis and the OLS technique, it is reported that inflation, GDP and exchange rate did not significantly influence bank profitability in Kenya. This is also in line with the empirical results reported by Kanwal and Nadeem (2013) in that macroeconomic variables had an insignificant impact on the profitability of commercial banks in Pakistan.

In a study based on Kenya, Ongore and Kusa (2013) employed panel data analysis with empirical results reporting that macroeconomic variables did not find significantly impact bank performance. Whilst on the other hand, Combey and Togbenou (2017), reported that inflation, GDP growth and real effective exchange rate significantly impacted bank profitability in Togo. Patrama (2015) also employed the Vector Error Correction Model in a study based on the influence of macroeconomic variables on the performance of Indonesian Islamic banks. Empirical results revealed short term shock of banking performance to fluctuations in macroeconomic variables. In a related study by Carvallo and Pagliacci (2014) based on the Venezuela banking industry, it was found that rising interest rate and domestic currency appreciation contributed to banking sector instability. The empirical study by Ongeri (2014) also found that macroeconomic variables significantly impacted bank performance in Kenya. While Festic and Beko (2008) reported that GDP growth influences bank performance positively in Togo.

Saeed (2015) also made an empirical contribution to the literature on the impact of industry-specific, bank-specific and macroeconomic variables on bank profitability in the UK. The study was based on data from 73 UK banks. Empirical results based on correlation and regression analyses revealed that inflation and GDP growth had a negative impact on bank profitability while loan, deposits, bank size, capital ratio, interest rate and liquidity had a positive impact on ROA and ROE. Gikombo and Mbugua (2018) also examined the impact of macroeconomic variables on the performance of 44 listed commercial banks in Kenya. From the empirical results, it is concluded that the profitability of commercial banks is affected most by the GDP while interest rate significantly influenced the return on assets and return measures of profitability.

Several studies have also documented the impact of macroeconomic variables on bank performance in Nigeria. However, the evidences presented thus far are largely mixed, inconsistent and inconclusive. Olaoye and Olarewaju (2015) in a study based on panel data analysis related macroeconomic variables and bank specific factors to the profitability of Nigerian commercial banks. Empirical results did not reveal any significant relationship among the variables. In a similar study based on Granger Causality tests, Johansen Cointegration tests, multiple regression model and Vector Error Correction Modeling, Akani, Nwanna, and Mbachu (2016) finds that macroeconomic variables did not significantly impact bank profitability. Osamwonyi and Micheal (2014) also documented the impact of macroeconomic variables on the profitability of Nigerian listed commercial banks. Results revealed that inflation and interest rate were the key variables influencing banking performance. A similar study was also carried out by Abusomwa (2018). This study employed the Generalized Method of Moments technique based on based on data

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from 120 bank branches and 2400 bank customers in Nigeria. Empirical results revealed that macroeconomic performance positively influenced the performance of Nigerian banks. In addition, employment status and gender of managers also influenced bank performance.

The empirical study by Baba and Nasieku (2016) also provided empirical evidence on the subject matter. Empirical results revealed that exchange rate, interest rate and unemployment rate influences bank performance negatively in Nigeria. Obamuyi (2013) reported that improved bank capital and interest income and favorable economic condition resulted in an improvement in bank performance. Osuagwu (2014) also provided evidence on the determinants of bank profitability in Nigeria using a panel of selected banks. Results revealed that bank profitability is largely influenced by credit risk as well as other factors related to the internal organization of banks. Although, the literature is replete with empirical studies on Nigeria, results so far are conflicting and the controversies are far from settled. The raging issues and mixed results reported by previous studies necessitates the need to revisit the subject area. We therefore expect that our approach will greatly enrich the literature as well as uncover what macroeconomic variables portend for bank performance in Nigeria.

Research Gap

There exists lack of universality of opinion on the notion of what constitutes business success, as success is largely viewed within the subjective prism of the entrepreneur (Perez &Caninno; 2009, Ibrahim & Goodwin 1986). Prior studies for instance Abdullahi & Sulaiman (2015), Bala & Mukhtar (2014), Akinruwa, Awolusi & Ibojo (2020), concluded that the determinants of SMEs performance/success in Nigeria are multi-faceted. They however failed to align these factors to key performance/success indicator. This study therefore seeks to bridge the identified gaps by linking business environmental factors to key SMEs success indicator, especially in an economy like Nigeria where, arguably access to finance, inadequate infrastructure, weak institutional framework calumniating in inconsistent and sometimes hostile regulatory environment etc. constrain business opportunity exploitation. In measuring success, the study limits itself to financial measures of SMEs success specifically, profitability as this is believed to offer a quantifiable, objective and universal appraisal of success. Corroborating this position, Phillips (1999), asserted that long-term goals (market share, brand names and reputations etc.) achievement is contingent upon a firm capability to obtain profitability in the short run.

Methodology

Research Design

The research design employed in this research is the ex-post facto research design. Ex-post factor research design was adopted. This is because, the researcher does not aim to control any of the variables under investigation and our pre-disposition is to observe occurrence over a period of time (1986-2021).

Nature and Sources of Data

This study will employ secondary data sources from Annual Reports and Accounts of the Central Bank of Nigeria (CBN) under consideration in the research. Data were collected and extracted from the Central Bank of Nigeria (CBN) statistical bulletin.

Model Specification

The Auto Regressive Distributed Lag Model (ARDL) Regression analysis shall form the main procedure to the followed in testing our hypotheses in this work.
ARDL specification for the model

$$\Delta(DEXR)_t = \pi_0 + \pi_1(DINTR)_{t-1} + \pi_2(DINFR)_{t-1} + \pi_3(DMS)_{t-1}$$

Where:

EXR = Exchange rate
INTR = Interest rate
INFR = Inflation rate
MS = Money supply
Δ denotes the first difference operator
π_0 is the drift component,

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μ_t is the white noise residuals.

The left-hand side in Equation above equation represents domestic inflation rate. The first until fifth expressions ($\pi_1 - \pi_{12}$) on the right-hand side correspond to the long-run relationship between the variables.

Method of Data Analyses

The empirical analysis employed the Auto Regressive Distributed Lag Model (ARDL) technique of econometrics for hypothesis 1-3 while granger causality test was used to test for hypotheses 4. The ARDL technique was used for estimating the equation models that were specified under the model specification. This method is popularly used because of its simplicity and strong theoretical properties such as linearity, unbiased and minimum variance among a class of unbiased estimator (Gujarati, 2007).

Result and Interpretations

Table 1: Auto Regressive Distributed Lag Model (ARDL) Model

Dependent Variable: EXR
Method: ARDL
Date: 06/12/23 Time: 21:59
Sample (adjusted): 1987 2021
Included observations: 35 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (0 lag, automatic): INTR INFR MS
Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
EXR(-1)	0.831894	0.110002	7.562568	0.0000
INTR	-0.355819	0.895724	-0.397241	0.6940
INFR	0.221661	0.203668	1.088344	0.2851
MS	-0.000890	0.001652	-0.539063	0.5938
C	8.422582	17.67255	0.476591	0.6371

R-squared	0.897330	Mean dependent var	77.46257
Adjusted R-squared	0.883641	S.D. dependent var	54.45607
S.E. of regression	18.57578	Akaike info criterion	8.813158
Sum squared resid	10351.79	Schwarz criterion	9.035350
Log likelihood	-149.2303	Hannan-Quinn criter.	8.889859
F-statistic	65.54953	Durbin-Watson stat	1.897409
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Eviews Output, 9.0

Based on Table 1, the interpretation of the results as regard the coefficient of various regressors' is stated as follows:

The value of the intercept which is 0.831894 shows that exchange rate will experience 83% increase when all other variables are held constant.

The estimate coefficients -0.355819 (INTR) shows that a unit change in Interest rate will cause -36% decrease in exchange rate. The estimate coefficients 0.221661 (INFR) shows that a unit change in inflation rate will cause 22% increase in exchange rate. The estimate coefficients -0.000890(MS) shows that a unit change in money supply will cause -0.00890% decrease in exchange rate.

From the above table the coefficient of multiple determination also called R^2 has a value of 0.897330 which is also 70% change in dependent variable by independent variable. This 90% shows that the model has goodness of fit.

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From the same table the F-Statistics shows that all the variables were statistically significant which was represented by (65.54953) with p-value of 0.000000 which is less than 5% margin of significance.

Hypothesis Interpretation

Hypothesis One

H_1: Interest rate has positive and significant effect on real exchange rate in Nigeria

Decision Rule:

Reject H_0 if the statistic is > 2.0 and the probability of the t-statistics is < 0.05, if not, do not reject.

Decision: The decision criteria is to reject H_0 if the statistic is > 2.0 and the probability of the t-statistics is < 0.05. It is shown in table 1 that the t-statics is -0.397241 while the probability value is 0.6940, this depict that the t-statistics is less than 2.0 while the probability value is greater than 0.05; therefore, the null hypothesis (H_0) is accepted and concluded that Interest rate has negative and significant effect on real exchange rate in Nigeria.

Hypothesis Two

H_2: Inflation rate has positive and significant effect on real exchange rate in Nigeria

Decision Rule:

Reject H_0 if the statistic is > 2.0 and the probability of the t-statistics is < 0.05, if not, do not reject.

Decision: The decision criteria is to reject H_0 if the statistic is > 2.0 and the probability of the t-statistics is < 0.05. It is shown in table 1 that the t-statics is 1.088344 while the probability value is 0.2851, this depict that the t-statistics is greater than 2.0 while the probability value is less than 0.05; therefore, the null hypothesis (H_0) is rejected and concluded that Inflation rate has positive and non-significant effect on real exchange rate in Nigeria.

Hypothesis Three

H_3: Money supply has positive and significant effect on real exchange rate in Nigeria

Decision Rule:

Reject H_0 if the statistic is > 2.0 and the probability of the t-statistics is < 0.05, if not, do not reject.

Decision: The decision criteria is to reject H_0 if the statistic is > 2.0 and the probability of the t-statistics is < 0.05. It is shown in table 1 that the t-statics is -0.539063 while the probability value is 0.5938, this depict that the t-statistics is less than 2.0 while the probability value is greater than 0.05; therefore, the null hypothesis (H_0) is accepted and concluded that Money supply has negative and significant effect on real exchange rate in Nigeria.

Discussion of Findings

In interpreting hypothesis one; it is shown in table 1 that the t-statics is -0.397241 while the probability value is 0.6940, this depict that the t-statistics is less than 2.0 while the probability value is greater than 0.05; therefore, the null hypothesis (H0) is accepted and concluded that Interest rate has negative and significant effect on real exchange rate in Nigeria. This study agreed with the study of Emeh (2021) examined inflation rate and Entrepreneurship Development in an Emerging Economy. The study was conducted through a survey in which copies of the questionnaire were distributed to elicit a response from the respondents which are small and medium businesses in South Eastern, Nigeria. The population size was 522. The study used the Analysis of Moment Structures (AMOS) to test this moderating effect, but could only establish a negative moderating effect of inflation on job creation. The study concludes that while access to markets and trade competition have nothing to do with local constraints on predicting job creation, trade deregulation does.

In interpreting hypothesis one; it is shown in table 1 that the t-statics is 1.088344 while the probability value is 0.2851, this depict that the t-statistics is greater than 2.0 while the probability value is less than 0.05; therefore, the null hypothesis (H0) is rejected and concluded that Inflation rate has positive and non-significant effect on real

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exchange rate in Nigeria. This study agreed with Ejiogu, Chima, and Nwede, (2017) who conducted a study on Exchange rate and Performance of Manufacturing Firms in Nigeria. The analysis of data was done with the Spearman's rank order correlation coefficient with the assistance of the Statistical Package for Social Sciences (SPSS). The outcome of the research is that exchange is positive and it has a good relationship with the performance of firms.

In interpreting hypothesis one; it is shown in table 1 that the t-statics is -0.539063 while the probability value is 0.5938, this depict that the t-statistics is less than 2.0 while the probability value is greater than 0.05; therefore, the null hypothesis (H0) is accepted and concluded that Money supply has negative and significant effect on real exchange rate in Nigeria. This study conforms with the study of Okwu, Bakare and Obiwuru (2020) who studied business environment, interest rate, job creation and employment capacities of small and medium enterprises using Lagos State, Nigeria. The study employed descriptive approach to examine job creation and employment capacities of SMEs in relation to the Lagos State business environment. Through survey, target population and sample size were determined. The target population used was 456 SMEs. The sample size was 228 while a convenience sampling technique was used. The findings revealed that inadequate access to external finance, high interest rate, competitive pressures, multiples taxes and other fees as well as corrupt practices were among the militating factors against the SMEs, while socio-cultural elements availability and costs of labour services did not constrain the enterprises.

Summary of Findings

This research has explored the Economic Labyrinth: The Minotaur of Exchange Rate in Nigeria's Maze from 1986–2021.

The following findings were made from the above analysis:

i. Interest rate has negative and significant effect on real exchange rate in Nigeria. This result confirms the findings **(**t-statistics is -0.397241 while the probability value is 0.6940).
ii. Inflation rate has positive and non-significant effect on real exchange rate in Nigeria. This result confirms the findings **(**t-statistics is 1.088344 while the probability value is 0.2851)
iii. Money supply has negative and significant effect on real exchange rate in Nigeria. This result confirms the findings **(**t-statics is -0.539063 while the probability value is 0.5938).

Conclusion

From findings, the variables for macroeconomic indicators which include Interest rate, Inflation rate and Money supply came out with negative and non-significant outcome on vales exchange rate. In spite of this dominance of the Nigerian economy by export services, their contribution to the GDP is below 5%. The results of the study show that several factors such as inflation, exchange rate and interest rate directed at borrowing from bank to produce for export did not stand the test of time and while exploiting the economic potentials of exportation activities in Nigeria is still a mirage as the program had constraints from deriving maximum benefits from them due to administrative bottlenecks and policies on export.

Recommendation

From the findings the following findings were made:

i. The Central Bank of Nigeria needs to formulate monetary policy that will stabilize the Naira against other currency as well as allow such policy to complete their gestation period before subjecting them to change. One of the things that aid exchange rate misalignment is the frequent change of monetary policies, such changes could trigger shock in the fundamentals.
ii. Also, the government should stimulate the productive sector of the economy so that the Nigeria economic growth can sufficiently stimulate the appreciation of the Naira.
iii. A major policy implication of this result is that concerted effort should be made by policy makers to increase the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to boost the growth of the economy. Inflation can only be reduced to the barest minimum by increasing output level (GDP).

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