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INTEREST RATE, EXCHANGE, RATE AND INFLATON IN NIGERIA: AN ECONOMETRIC APPROACH

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Abstract

This study examined the relationship between interest rate, exchange rate and inflation in Nigeria. Data for the study were obtained from world banks world development indicators 2022. The unit root of the model that was generated was examined by using the Augmented Dickey Fuller (ADF) approach for the research. The results of the ADF unit root test showed that the variables displayed a variety of integrated orders. This was discovered as a result of the test's conclusion. This suggests that certain variables displayed stationarity at level I(0), whereas others reached stationarity after passing through initial discrepancies at level I(1). The Auto-regressive Distributive Lag model was used in the current investigation to investigate whether or not there is a connection that exists over the course of time between interest rates, exchange rates, and inflation. It has been shown that the real interest rate has a statistically significant inverse relationship with inflation in both the long-run and the short-run, namely within the current year period. This correlation holds true for both the long-run and the short-run. During the course of the current year, the lending interest rate exhibited a positive and statistically significant link with inflation in both the long-term and short-term time periods. In addition, based on the link between the interest rate on deposits and inflation, we may deduce that the interest rate on deposits has a positive influence, although one that is statistically insignificant, on inflation during the short-term period of the year before. There is an inverse relationship between currency exchange rates and inflation in the short term, which holds true for both the current year and the year before it. It has been recommended, amongst other suggestions that the Central Bank of Nigeria should continue to raise the interest rate as a measure to curb the growing trend of inflation. This advice was made in light of the fact that the CBN is tasked with preventing inflation.

Keywords: Real Interest Rate, Deposit Rate, Lending Rate, Inflation

1.0 Introduction

The monetary policy authority of an economy has responsibility for the control of inflation. This practice is to prevent the economy from overheating and inflation spiraling upwards in the time of expansion. Therefore, the desire of every country (developed, developing and less develop) is to maintain a small amount inflation to prevent inflation spiral, which pushes an economy into a depression in time of recession. The rate at which prices have increased over a certain period of time is referred to as inflation. According to Gbadebo and Mohammed (2015), inflation may be defined as a phenomena that is characterized by a widespread and prolonged rise in the prices of goods and services within an economy. The value of money declines as a result of inflation, which also has a negative impact on the standard of living of the people as a whole. Kanu (2002), noted that inflation is a state that may be defined as a condition that is characterized by a considerable and persistent increase in the prices of goods and services. In Nigeria, inflation has become a serious national problem that has had a negative influence on the economy for a considerable amount of time. This has been the case for a number of years. All of the preexisting concepts in economics have been elevated to a divine status as a result of this occurrence. According to the findings of the study that was carried out by Masha (1995), the inflation rate in Nigeria is affected by variables that originate from both the demand and supply sides of the economy. Pressures on the demand side of the economy are caused by shifts in the monetary aggregates, while pressures on the supply side of the economy are the consequence of fundamental structural aspects of the economy.

It is essential to recognize the significance of the dual role that interest rates and exchange rates play in determining inflation. Take, for instance, the scenario in which the cost of conducting business rises regardless of the level of demand, the local currency experiences a depreciation, and the costs associated with importing raw materials rise as a result of the combination of these two events. Inflation is certain to follow immediately after the government enters into salary talks as a reaction to the agitation and strikes of labor unions. As a result, the interest rate is a representation of the financial expenditure that the borrower will bear in addition to the financial gain that the lender will earn. It is essential to recognize that an improvement in a customer's borrowing capacity results from a reduction in the applicable interest rate. It has been noted in the field of economics that increasing consumer spending has a propensity to boost the natural development of the economy, which has the potential to lead to inflation as a result. When there is a rise in inflation, there is a tendency for interest rates to rise, and when there is a drop in inflation, there is a tendency for interest rates to fall. However, when there is an increase in inflation, there is a tendency for interest rates to rise. According to Amaefula (2016), this data shows that there is a positive association between the two factors. This viewpoint is consistent with Fisher's theory of effect (1930), which posits that the real interest rate is equal to the nominal interest rate less the projected inflation. The real interest rate is calculated by subtracting the predicted inflation from the nominal interest rate. This means that a rise in the interest rate will be related with an increase in inflation, whilst a fall in the interest rate will be linked to a decrease in inflation. This also suggests that a downward adjustment in the interest rate will be associated with a decrease in inflation. It is essential to recognize that in Nigeria, the exchange rate of the local currency has a significant impact on the most important macroeconomic indicators. The exchange rate is a theoretical construct that expresses the rate at which one currency may be exchanged for another

currency. The term "exchange rate" was coined by economists in the 18th century. It has a considerable impact on the conduct of business on a global scale and acts as a catalyst for the movement of money across national boundaries.

According to Dornbuch (1976), the term "exchange rate" refers to the shift in value that occurs between two different national currencies. This shift, in turn, causes an increase in the overall price level. When there is a depreciation in the value of one country's currency relative to another, in particular when there is an increase in the value of the domestic currency, it is reasonable to assume that overall prices will fall. Changes in the value of one country's currency relative to another have an immediate and direct bearing on the costs of production because of the effect that these shifts have on the prices of imported goods, which are themselves susceptible to variations in exchange rates. As a result, we may conclude that there is a significant relationship between the currency exchange rate and the rate of inflation. Therefore, it is vital for growing countries to utilize real exchange rate policies in order to successfully control domestic inflation and preserve stability in both domestic production and international competitiveness. This should be done while avoiding the dangers that are associated with foreign currency limits. If the monetary policy authority, known as the Central Bank of Nigeria (CBN), is unable to make well-informed decisions regarding its target variables, such as interest rate and exchange rate, then it will lead to an increase in inflation, which will in turn cause significant repercussions on the economy. Take, for instance, the situation in which there is an increase in the rate of inflation. Those individuals who are dependent on fixed incomes will see a decrease in their purchasing power under these conditions, which will lead to an increase in the existing income gap. In addition, according to the Fisher Effect Theory, an increase in inflation has the effect of exerting impact on exchange rates, which results in an increase in the level of that influence. A rise in interest rates, when combined with rising inflation, will inevitably result in a proportional rise in the costs of production.

The incongruity and inconsistent results that were seen in earlier empirical research served as the impetus for conducting this study discourse. Several academics have embarked on research projects to investigate the connection between interest rates and price increases. Evidence that suggests an inverse relationship between interest rates and inflation has been discovered by Musa (2021), Charumbira (2021), Ercan et al. (2020), Amaefula (2016), and Asgharpur (2007). In addition, the results of these research suggest that the link between interest rates and inflation is one that is causative, in the sense that changes in interest rates cause corresponding shifts in inflation. However, contradictory results have been presented in the study carried out by Khan (2020) as well as Bernard and Santos (2012), revealing a different viewpoint that asserts a positive association between interest rates and inflation. Bernard and Santos (2012) found that there was a positive correlation between interest rates and inflation. This finding implies that there is a void in the system. In addition, studies on the topic have been carried out by Ercan et al. (2020), Abiodum et al. (2016), and Fetai et al. (2012). These studies studied the connection between currency exchange rates and inflation. According to the results of these research, variations in exchange rates had an impact that was counteracting the effects of inflation. On the other hand, the research that was carried out by Sanam and Fetullah (2017) revealed that there is a positive association between exchange rates and inflation. On the other hand, Abderezak and Samet (2016) concluded from their study that exchange rates had an effect on inflation, which indicates a difference between the two sets of findings. In the end, it was determined that with the exception of Ercan et

al. (2020), who conducted a comprehensive investigation on the interplay between interest rates, exchange rates, and inflation, the other studies mainly focused on either the relationship between interest rates and inflation or the relationship between exchange rates and inflation. This was the conclusion reached after it was determined that Ercan et al. (2020) was the only study to conduct a comprehensive investigation on the interplay between interest rates, exchange rates, and inflation. There is no appraisal or analysis of inflation, interest rates, or currency rates included in the user's post. As explanatory factors, Ercan et al. (2020) used a wide range of economic indicators into their research. These variables included the overnight interest rate, the consumer price index, the dollar selling rate, and the interest rate of commercial banks. They failed to account for the possibility that interest rates on deposits might have an effect on inflation. Therefore, there is an obvious gap in the current body of literature that merits attention and has to be filled, and this issue needs to be addressed.

By carrying out an empirical analysis of the dynamic relationship between interest rates, exchange rates, and inflation in Nigeria across the span of time from 1980 to 2022, the purpose of this study was to provide new information to the current body of knowledge. As a consequence of this finding, the field of study that had been done before on this topic was broadened by this investigation. Following the introduction is a complete assessment of the existing literature, encompassing conceptual, theoretical, and empirical views on interest rates, exchange rates, and inflation, which is presented in Section 2 of this work. The succeeding parts of this work are arranged as follows: Section 1 gives an introduction, while Section 2 includes a full overview of the current literature. In the third part of the study, a detailed discussion of the research procedures that were used is presented, along with an explanation of the research variables. On the other hand, the outcomes that were acquired will be discussed in section 4, which is its own separate part. The consequences and suggestions for public policy were discussed in Section 5

2.0 Literature Review

2.1 Conceptual Clarification

Interest Rate

Interest rates are a crucial indicator in financial markets and have a considerable influence on the economy as a whole due to the enormous effect they have. Therefore, the expenditure that is involved with getting a loan is referred to as the "interest rate." This expense is defined as a proportion of the total amount borrowed and is commonly expressed as a percentage. This suggests that investors would move their money from regions that have low interest rates to regions that have higher interest rates since the former provides an enticing opportunity for international investors who are looking for larger returns. According to Babalola et al.'s (2015), the term "interest rate" refers to the percentage that a borrower pays to a lender as payment for the right of using borrowed money. The cost of borrowing money or capital from a lender is represented by the interest rate. This cost may be thought of as the price paid for the use of the capital or the financial sacrifice made in order to receive it. Individuals who decide not to hoard their resources but, rather, elect to distribute their liquidity for a predetermined period of time will get a higher interest rate as a kind of reward for their decision. As suggested by Keynes (1936), the lending

rate is given a greater weight in the modern definition of interest rate. Sanusi (2002), interest rates are a representation of the costs that a borrower must suffer in order to acquire a loan within any particular economic setting. This shows that interest rates play a significant role in setting the cost of credit within an economy, and that this function is an important one. Borrowers in a society may be dissuaded from applying for loans at the most advantageous periods if interest rates in that society are high relative to those in other societies. According to SSekuma (2011), the process of borrowing money results in an additional expense that is referred to as the interest rate. In addition to having a negative effect on businesses that produce things, increased interest rates also have a negative effect on businesses that are involved in the real estate market. The influence that increasing interest rates will have on people's desire to get mortgages will provide a substantial obstacle for the price dynamics of residential real estate. On the other hand, proponents of high interest rates argue that increased interest rates boost the availability of dormant money within the market, so increasing the circulation of funds and making it easier for businesses to have easy access to capital in order to flourish.

The interest rate is very important to the economy since it is directly related to both the cost of capital and the availability of credit. As a result, it has a major impact on both of these factors. According to Davis and Emerenini (2015), it may have an effect on the economy by encouraging people to save more money. An economic indicator that shows the cost of acquiring credit for investment purposes inside an economy is called the interest rate. According to Abdul and Marwan (2013), a rise in interest rates has a detrimental influence on the profitability of corporations and simultaneously leads in an elevation of the discount rate that is employed for equity investors. Both of these effects occur simultaneously. As a direct consequence of this, the variables have a detrimental impact on the price of stocks. Because of this, it is reasonable to assume that a rise in the interest rate would have a negative impact on the performance of the organization, which would in turn have a negative impact on the values of the stock market**.**

Exchange Rate

The value of a country's currency as measured against that of other nations' currencies is referred to as the exchange rate. The extent of engagement of foreign markets in domestic commerce is heavily influenced by the exchange rate, which plays a critical part in setting the relative pricing of local items. The circumstances under which countries participate in the exchange of goods and services are established by the exchange rate, which is why it is such an important part of the global financial system. Within the context of broader frameworks for the formulation of economic policy and the implementation of reform programs, the value of the exchange rate is a major microeconomic variable that bears significant significance. This essential factor has a significant impact on the rate of acceleration that will be experienced by the expansion of a nation's economic activity. According to the findings of the study that was carried out by Godwin and Sergius (2021), the term "exchange rate" describes the size of a nation's currency in relation to the magnitude of other currencies when measured on an equal basis. The relative significance or worth of a nation's native currency in the context of the economy of the world as a whole is referred to as the "currency weight" of that nation. This notion is often used as a foundation for international payment. It is affected by a number of different factors. According to Bergen (2017), it is affected by factors such as differences in inflation rates, differences in interest rate differentials, current account

deficits, governmental debts, balance of trade, and political stability and economic performance. According to the findings of this research, the exchange rate is defined as the rate at which one currency is exchanged for another currency. This rate effects international business as well as the movement of money between countries. When compared to the nominal exchange rate, the real exchange rate, also known as the RER, is generally regarded to be a crucial indicator of macroeconomic policy. This is because it reveals a country's level of international competitiveness. The Real Effective Exchange Rate (RER) is the Nominal Exchange Rate (NER) that has been adjusted for price changes (inflation) in the domestic market in comparison to those of trading partners. The therapy of NER is dependent on the RER, which in turn is influenced by various variables, one of which is NER (Montiel, 1997; Azid et al., 2005; Thapa, 2002). NER itself is also one of these elements. It is vital to construct and maintain stable trade and foreign currency markets in order to accomplish sustainable long-term economic growth. This is required both for domestic and international economies. Nevertheless, when exchange rates aren't aligned properly, it may often have a negative effect on the growth of the economy. In the context of emerging countries, the phenomena of exchange rate misalignment, which is principally exemplified by the occurrence of the phenomenon of overvaluation, is seen on a frequent basis. This overvaluation has a negative effect on tradable commodities, which ultimately results in a fall in the prices that producers actually get for their goods. The issue known as RER misalignment may occur in markets in which real exchange rates are not given the opportunity to adjust to movements in the fundamentals of the economy (Thapa, 2002). As a consequence of this, the incentives and earnings are diminished, which, in the end, leads to a fall in the levels of investment and export**.**

Inflation

According to Gbadebo and Mohammed (2015), inflation may be defined as an ongoing and pervasive rise in the prices of goods and services across an economy. The propensity of economic actors to incorrectly perceive fluctuations in nominal variables as signs of changes in real variables, which leads to their making choices that are consistent with this misinterpretation, results in one large expenditure that develops as a result of the poor allocation of resources. When there is inflation, the opportunity cost of holding onto money is higher than normal. This causes the real resources involved in transactions to be distributed in an inefficient manner. As a result, inflation lowers the purchasing power of money and has a negative effect on the standard of living enjoyed by the populace as a whole. According to Kanu (2002), inflation is defined by an increase in the cost of goods and services that is both considerable and sustained over time. Price rises need to fulfill two conditions before they can be considered inflation: they need to be both reasonable and sustained over a prolonged amount of time. Inflation has emerged as a key national concern in Nigeria, and it has been having a negative influence on the country's economy for a prolonged period of time. This trend has given all of the previously established notions in economics the status of divine. According to the findings of the study that was carried out by Masha (1995), it has been noticed that variables coming from both the demand and supply sides have an effect on the level of inflation that is experienced in Nigeria. The pressures on the demand side of the economy are caused by shifts in the monetary aggregates, while the pressures on the supply side of the economy originate from the fundamental structural characteristics of the economy. It is a commonly held belief among academics that inflation in Nigeria may be traced back to a number of different causes. These causes may include, but are not limited to, increases in the prices of

goods and services, higher levels of income, an inflow of capital, continued deficit budgeting, and an increase in the amount of money in circulation**.**

2.2 Theoretical Literature

Fisher International Effect Theory

Irvin Fisher first conceived of the concept of having a worldwide effect in the year 1930. The theory proposes that the link between inflation and real interest rates is such that variations in inflation have no effect on real interest rates. This interpretation of the theory is supported by the empirical evidence. This is because the real interest rate is obtained by subtracting the inflation rate from the nominal interest rate. This is how the real interest rate is calculated. The theory proposes that a nation with a lower interest rate would have lower levels of inflation, which would result in an appreciation of the real value of its currency in comparison to the currency of another country. This shows that a rise in interest rates is related with increased levels of inflation, which in turn leads to a gradual depreciation of the nation's currency over the long run. However, in the short run, an increase in the interest rate will result in a rise in inflation that is comparable to the increase in the interest rate. As a consequence, given that we are expecting that the real interest rate will remain the same, any increase in the inflation rate will lead to an identical increase in the nominal interest rate. In the case that there is an increase in the rate of inflation, there will be a fall in the real return on capital if there are no changes made to the nominal interest rates. As a direct consequence of this, the quantity of available capital inside the country would decrease as a result. On the other hand, interest might be considered the expense that is incurred due to the use of capital. As a result, interest is included as a section of the total production costs. In this hypothetical situation, an increase in interest rates will have an effect on the escalation of production costs, which would then lead to an increase in inflation as a following outcome. On the other hand, according to Seyidolu (2003), the differences in nominal interest rates across the various countries correlate to the predicted variations in the exchange rates of these nations.

Because of the fall in nominal interest rates, there has been a corresponding reduction in the return of the home currency, which has led to a shift in the demand for the foreign currency. In addition, the market faces a decrease in returns, which results in the outflow of cash by international investors. An increase in exchange rates may be seen occurring in each of these situations. On the other hand, it is not inconceivable that exchange rates may see an upward trend as a consequence of the imbalance in supply and demand that is brought about by the movement of capital. In the hypothetical situation described above, there would be an increase in the costs that are connected with the import of raw materials and other essential inputs for domestic production. An increase in the domestic interest rate will be implemented in a country that does not operate under a system that maintains a fixed exchange rate in order to balance off the impact of an increase in the value of the currency on the cost of living. As a result, there is a two-way interaction that takes place between currency exchange rates, interest rates, and overall levels of inflation**.**

Capital Accumulation Growth Theory

Mbaye (2012) put out the idea of a theory concerning the rise of capital accumulation. According to the theory, the effect of exchange rates on economic growth is mediated through the influence that exchange rates have on people's propensity to save money. The undervaluation of the real exchange rate, as the notion goes, helps to economic growth by increasing the entire capital stock of the economy. This is how it is understood to work, at least according to the hypothesis. This would imply that a real exchange rate that has been depreciated has the ability to increase the domestic saving rate. Higher saving rates, which are brought about by depreciation, assist the stimulation of economic growth via an increase in the rate of capital accumulation. This is because an increase in the rate of capital accumulation leads to an increase in the rate of capital accumulation. The idea of capital accumulation postulates that there are two main pathways that might lead to the formation of capital: investment and personal earnings. The first mechanism places its emphasis only on the accumulation of capital inside the tradable goods sector, which ultimately leads to an increase in that sector's share of GDP. On the other hand, the second process includes an increase in the total stock of capital in the economy, which takes place as a result of a rise in the amount of money saved and invested.

Because a devalued real exchange rate has a tendency to redirect aggregate demand away from traded products and toward non-traded commodities, it requires an increase in the real interest rate in order to maintain internal equilibrium (Montiel & Serven, 2008). This results in a connection between a devalued real exchange rate and the savings rate. The influence that an increase in interest rates has on the domestic saving rate is one of the reasons why aggregate demand is affected negatively when interest rates go up. Therefore, it is possible to make the case that the real exchange rate has a causal influence on the growth of the economy, and that this effect is mediated through the real interest rate and the saving rate. By implication, it means that if the domestic exchange rate is favourable and flexible, it will send signal to operators in the financial market to reduce their interest rate which will give investors the leverage to access sufficient loan to carry out productive activities which will promote the growth of the Nigerian economy. However, if the exchange rate is very, interest rate will be affected and lead to decline in economic activities.

2.3 Review of Related Empirical Studies

There has been a significant amount of empirical investigation carried out in the topic of interest rates and their influence on inflation. On the other hand, the findings of these investigations were very variable and, in many cases, lacked conclusiveness. In the current study, which was conducted by Charumbira (2021), the relationship between interest rates and inflation rates in Botswana is analyzed to determine the impact that interest rates have on inflation rates. The Bank of Botswana provided the secondary economic data that was used in the study. The data set that was used included quarterly observations on inflation as well as nominal interest rates and covered the years 2000 through 2010. The data was graphically represented using graphical means, and the analysis was carried out using a regression model in order to determine the connection between the variables. Both were done in order to provide the information in an understandable manner. For the purpose of determining the relationship and evaluating the hypothesis, the statistical tool known as SPSS was used. According to the findings, there is a link between the interest rates in Botswana and the country's overall rate of inflation. In a similar vein, Musa (2021) investigates how the interest rate and the inflation rate are intertwined within the setting of Nigeria. The time range that was under consideration, which extended from 2000 to 2019, was broken up into two unique sub-time spans that were as follows: 2000 to 2007 and 2009 to 2019. According to the

results of the study, interest rates have very little influence in the short term on being able to control inflation. However, over the course of a longer period of time, they tend to become more influential and significant. In addition, it was discovered that the influence of interest rates on inflation rates over the course of a year had a considerable impact, despite the fact that the impact over a shorter period of time was determined to be rather insignificant.

Khan (2020) carried out research with the purpose of determining whether or not there is a connection between interest rates and inflation. The research was conducted in the United Kingdom (UK) utilizing data gathered annually from 1989 through 2017. The use of time-series analysis was one component of the approach that was applied. Methodologies such as the Vector Autoregression (VAR) model and the Johnson cointegration equation are often used while doing regression analysis. According to the results, when differentiated only once, the variables of interest rate and inflation both display characteristics of stationarity. I am. According to the findings of the VAR Granger causality test, there is a two-way relationship of causality existing between the variables of interest rates and inflation.

The authors of this study, Ercan et al. (2020), carried out an analysis as part of their research to determine the impact that changes in interest rates and currency rates have on inflation. The major purpose of this study was to determine whether factors, interest rates or exchange rates, had a more significant influence on the overall rate of inflation. According to the findings of the study, there is a meaningful and persistent connection between rates of inflation, exchange rates, and interest rates. Additionally, it has been shown that the effect of exchange rates on the Producer Price Index (PPI) is far more strong than the effect of interest rates on the PPI. In addition, it is predicted that a unidirectional causal relationship will be detected between the Interest Rate of Commercial Banks Credit (IRBC), Over Night Interest Rate (O/N), United States Dollar (USD), and the Producer Price Index (PPI). This link will be seen in the form of a correlation. On the other hand, it is not anticipated that there would be a link of this kind between the IRBC, O/N, USD, and the Consumer Price Index (CPI). The authors of this research, Sanam and Fetullah (2017), make use of time series data in order to investigate the association that exists between currency exchange rates and inflation. They employ a method called the Hendry General to Specific Modeling, as well as a model called the Vector Autoregression (VAR). In order for the researchers to accomplish this goal, they analyzed data from each year beginning in 1976 and continuing through 2012. The Hendry model arrives to the conclusion that there is a direct connection between the currency exchange rate and the rate of inflation. In order to undertake research on the relationships between changes in the money supply and fluctuations in exchange rates, a VAR model with the money supply variable included was used. According to the data, it is clear that the money supply as well as the exchange rate have a positive impact on inflation. This is the conclusion that can be drawn from the evidence. When compared to the effect that the exchange rate has on inflation, the effect of the money supply is far more substantial.

Amaefula carried out an investigation in the year 2016 with the goal of determining whether or not there is a connection in Nigeria's long-run equilibrium between the interest rate and inflation. The range of months covered by the data sets relating to interest rates and inflation was from January 1995 all the way through December 2014. According to the results, there is a link of long-term equilibrium between these two variables, and there is persuasive evidence of a unidirectional

Granger causation flow from interest rates to inflation rates in the long run. This flow is shown by the data. A research by Abiodun et al. (2016) explores the influence of currency rate pass-through on import and consumer prices in Nigeria between the first quarter of 1995 and the first quarter of 2015. The time period covered by the study is from 1995 to 2015. The research examined the level of exchange rate pass-through into Nigeria's Consumer Price Index (CPI) inflation using the Johansen approach to cointegration and a vector error correction methodology. According to the results of the study, the pass-through does not seem to be completely implemented. According to the findings of the research, the long-term pass-through elasticities for the baseline model were 0.24 and 0.30, respectively. The alternative model had a value of 0.30. The results of the study imply that the effect has less of an influence on consumer prices than it does on import costs, which indicates that the pass-through effect becomes less significant as it moves farther down the pricing chain. The aforementioned findings were of great use to the Central Bank of Nigeria in formulating and carrying out its policies regarding monetary conditions and exchange rates, since the findings provided significant input**.**

The article by Fetai et al. (2016) conducts an empirical investigation on the links between exchange rates and inflation in the countries of the Western Balkans. The major objective of this study is to evaluate the degree to which fixed exchange rates have an influence on inflationary performance, in comparison to the efficacy of flexible exchange rates as a mechanism for absorbing economic shocks in the Western Balkans area. This will be done by determining the extent to which fixed exchange rates have an impact on inflationary performance. According to the results, the exchange rate is still the dominant factor contributing to inflationary pressures in the countries of the Western Balkans. Abderezak and Samet (2016) carried out research to investigate the relationship that exists between Turkey's inflation rate and currency exchange rate. Both Turkey and the United Kingdom contributed data on their respective inflation rates to the research. In the research, an ordinary least squares (OLS) regression was combined with a generalized autoregressive conditional heteroskedasticity (GARCH) model as the foundation. This was done in order to investigate the connection between inflation and exchange rate. According to the data that were produced from the ordinary least squares (OLS) regression study, Turkey does not display any signs of purchasing power parity (PPP). However, the existence of ARCH and GARCH in the association shows that the deviations from Purchasing Power Parity (PPP) are not of a random character but rather reflect a visible structure. This is because PPP is a measure of the relationship between prices and purchasing power.

The research that was carried out by Bernard and Santos (2012) investigates not only the degree to which the Fisher effect hypothesis is supported, but also the connection that exists between expected rates of inflation and nominal interest rates in Nigeria. This is accomplished by deducting the anticipated inflation rate from the nominal interest rate in order to arrive at the desired result. During the period beginning in 1970 and ending in 2009, inclusively. The findings suggest that there is a positive link between interest rates and estimates of future inflation over the long run; however, this association is not a direct correspondence between the two variables. This conclusion implies that the Fisher hypothesis as a whole is not supported; nonetheless, a substantial Fisher effect was seen in the context of Nigeria during the course of the time period that was analyzed.

Furthermore, the Fisher hypothesis suggests that causality flows only from predicted inflation to nominal interest rates, without any occurrence of "reverse causation." Additionally, it is noteworthy that the partial explanation for the disparity between long-term and short-term interest rates accounts for just around 16 percent of the overall disequilibrium. According to the Fisher effect in Nigeria, the major objective of monetary policy should be the amount of real inflation. This is the primary focus of the Fisher effect. Asgharpur et al. (2007) analyze in this research the causal link between the interest rate and the inflation rate in a panel of 40 precisely selected Islamic countries. These nations were chosen because they are considered to be representative of the Islamic world. In order to conduct their analysis of the data covering the years 2002 to 2005, they make use of a unique causality technique in conjunction with panel data methodologies. The results of this study point to a unidirectional link in which changes in interest rates have a direct and causative impact on inflation rate shifts across a sample of 40 Islamic countries. The findings of this research have important implications for decision-makers engaged in macroeconomic planning, particularly within countries that adhere to the Islamic faith. According to the results, in order for financial institutions to reduce the risk of inflation, it is imperative that they reduce interest rates

3.0 Methodology

In order to investigate the connection between interest rates, exchange rates, and inflation, this study used an ex-post facto research methodology. Following the completion of the Augmented Dickey Fuller unit root (ADF) test, which was used to determine whether or not the variables were stationary, the Auto-regressive Distributive Lag (ARDL) model was used in order to perform an analysis of the connection between the variables. In order to determine whether or not there is a connection that exists throughout the course of time between the variables, the researchers carried out a bound test. The World Bank's World Development Indicators (WDI) for the year 2022 served as the primary source for the secondary data that was included into the research**.**

3.1 Model Specification

The Fisher International Effect hypothesis serves as the primary building block for the development of the model. This hypothesis states that the nominal interest rate in a particular nation is equivalent to the sum of the real interest rate and the expected inflation rate in that nation. This would imply that a fall in nominal interest rates would result in a decline in the value of the home currency, which would cause a shift in the demand for the foreign currency. In addition, the returns on the market have been going down, which has caused international investors to pull their money out of the market. The value of one currency relative to another increases in every one of these circumstances. On the other hand, it is not impossible for currency exchange rates to fluctuate as a consequence of differences in supply and demand brought about by the flow of money. This is a theory that may be supported by evidence. Consequently, the models presented by Ercan et al. (2020) in their investigation of the interaction of exchange rate, interest rate, and inflation in the context of Turkey have been adapted so that they can be used in the construction of the model that will be used in the current research. The model will now be shown in the following fashion:

PPI= f (CPI, USD, O/N IRBC)

Where;

PPI = Producer Price Index CPI = Consumer Price Index, USD= Dollar Selling Rate, IRBC, = Interest Rate on the commercial Bank.

The model was modified by introducing deposit interest rate (DINR) as new variable. The model is specified as follows:

$IFR = f(RIR, LINR, DINR, EXCR)$ 1

The mathematical model could be symbolically expressed as;

$INFR = \phi 0 + \phi 1RIR + \phi 2LINR + \phi 3DINR + \phi 4EXCR$ 2

Equation (3.2) above is transformed into an econometric model by incorporating the disturbance term (ε) as follows;

$IFR = \phi 0 + \phi 1RIR + \phi 2LINR + \phi 3DINR + \phi 4EXCR + e$ 3

Logarithmic transformations are often used as a convenient approach for turning highly skewed data into a distribution that is comparable to normalcy (Kenneth, 2011). This is accomplished via the use of the natural logarithm.

The model that was used in this investigation has been modified and currently has the form that is described here

$IFR = \phi 0 + \phi 1RIR + \phi 2LINR + \phi 3DINR + \phi 4LEXCR + e$ 4

Where;

IFR = Inflation RIR = Real Interest Rate, LINR= Lending Interest Rate, DINR = Deposit Interest Rate, *EXCR* = Exchange Rate, f = functional relationship

ϕ0 = Intercept of relationship in the model/constant ϕ1-ϕ4 = Coefficients of each independent or explanatory variable e= Stochastic or Error term

Description of Variables in the Model

Inflation Rate (IFR): An economy is said to be experiencing inflation when there is a widespread and persistent rise in the prices of goods and services throughout the economy. The variable of interest in this investigation is referred to as inflation, and its value is expressed as a percentage (%)

Real Interest Rate (RIR):

This is the interest rate that is been adjusted for inflation. This study assumes that as real interest rate increases, investors will find it difficult to access the required funds to enable them meet their short and long term obligations such as acquisition of machineries as well as direct and indirect materials. Consequently, input for productive activities will drop leading to decline in output productivity. Therefore, a positive relationship is expected between RIR & IFR. Thus, δ IFR/RIR >0

Deposit Interest Rate (DINR): The deposit interest rate is the rate paid by deposit money banks or similar financial institutions for demand, time or savings deposit. This means that DINR is the rate paid to deposit account holders for account like certificate of deposit and savings account. The

deposit interest rate is used to capture the independent variable "interest rate". This research discourse believed that increase in the deposit rate will encourage customer's (savers) to increase their savings which will stimulate investment and enhance the efficiency of the real sector particular agricultural sector leading to increase food supply and low prices of goods and services.. Consequently, this paper expect an inverse relationship between DINR & IFR. Thus, δ IFR/DINR <0

Lending Interest Rate (LINR): The lending interest rate refers to the bank rate that usually meets the short-run and medium term financing of the private sector. The lending interest rate is used to proxy the independent variable "interest rate". This paper assumes that as lending interest rate increases, investors will find it difficult to access the required funds to enable the meet their short and long term obligations such as acquisition of machineries as well as direct and indirect materials. Consequently, input for productive activities will drop leading to decline in output productivity. Therefore, a positive relationship is expected between LINR & IFR. Thus, δ IFR/LINR >0

Exchange Rate (EXCR):

An economy is said to be experiencing inflation when there is a widespread and persistent rise in the prices of goods and services throughout the economy. The variable of interest in this investigation is referred to as inflation, and its value is expressed as a percentage (%)**.**

Method of Data Analyses

Unit Root Test

The study employed the Augmented Dickey Fuller (ADF) unit root test to establish the amount of integration of the variables that were being studied. The research was conducted with the intention of identifying the appropriate strategy to avoid false regression**.**

The ARDL Methodology

In order to determine how closely the variables are connected, the study used Pesaran, Shin, and Smith's (2001) autoregressive distributive lag model (ARDL) to the data. This model was used to estimate the relationship between the variables. In order to test whether or not there is a cointegration connection, the model is thus stated in a manner that allows for unlimited error correction. This may be seen in the following:

In the following fashion, the Autoregressive Distributed Lag (ARDL) Model is formulated**:**

$$\Delta IFR_t=\phi_0+\Delta IFR_{t-1}+\Sigma\phi_{1t}\Delta RIR_{t-1}+\Sigma\phi_{2t}\Delta LINR_{t-1}+\Sigma\phi_{3t}\Delta DINR_{t-1}+\Sigma\phi_{4t}\Delta LEXCR_{t-1}+\Delta IFR_{t-1}+\Sigma\alpha_{1t}\Delta RIR_{t-1}+\Sigma\,\alpha_{2t}\Delta LINR_{t-1}+\Sigma\alpha_{3t}\Delta DINR_{t-1}+\Sigma\,\alpha_{4t}\Delta LEXCR_{t-1}+e \quad 5$$

It is possible to draw the conclusion that there is cointegration if the estimated F-statistic is greater than the critical value when compared to the significance threshold of 5%. This is the inference that arises from this context. If the F-statistic that was computed falls below the critical value at a significance level of 5%, then one may draw the conclusion that there is no cointegration. This would be the case if the significance threshold was 5%. Nevertheless, the inference is seen as being

unconvincing if the estimated value of the F-statistics falls within the range of the critical values for both the upper and lower limits. After a link for cointegration has been constructed, the long-run model may be approximated in the manner that has been explained

$$\Delta IFR_{t-1}+\Sigma\alpha_{1t}\Delta RIR_{t-1}+\Sigma\alpha_{2t}\Delta LINR_{t-1}+\Sigma\alpha_{3t}\Delta DINR_{t-1}+\Sigma\alpha_{4t}\Delta LEXCR_{t-1}+ e \quad 6$$

To continue along this line of thought, the estimate of the short-run model of the error correction specification is carried out in order to investigate the short-term dynamic behavior of the variables that are included into the model**;**

$$\Delta IFR_t=\beta_0+\Delta IFR_{t-1}+\Sigma\beta_{1t}\Delta RIR_{t-1}+\Sigma\beta_{2t}\Delta LINR_{t-1}+\Sigma\beta_{3t}\Delta DINR_{t-1}+\Sigma\beta_{4t}\Delta LEXCR_{t-1}+ ECT_{t-1}+ e \quad 7$$

Where the ECT in the above equation is specified as;

$$ECT_t=\Delta IFR_t-\beta_0-\Delta IFR_{t-1}-\Sigma\beta_{1t}\Delta RIR_{t-1}-\Sigma\beta_{2t}\Delta LINR_{t-1}-\Sigma\beta_{3t}\Delta DINR_{t-1}-\Sigma\beta_{4t}\Delta LEXCR_{t-1} \quad 8$$

Finally, the study diagnosed the model by conducting test for serial correlation, Ramsey reset test and heteroskedasticity.

4.0 Empirical Data Analysis

Table 1: Descriptive Statistics

	IFR	RIR	LINR	DINR	EXCR
Mean	18.73256	0.367442	17.10930	10.77907	112.9788
Median	12.90000	3.000000	16.90000	9.800000	111.2300
Maximum	72.80000	18.20000	31.60000	23.20000	425.9800
Minimum	5.400000	-65.90000	8.400000	4.200000	0.550000
Std. Dev.	16.31778	13.93756	4.949979	4.147894	119.0559
Skewness	1.912756	-2.757562	0.304352	0.757538	1.050328
Kurtosis	5.581986	13.42323	3.434810	3.528234	3.278636
Jarque-Bera	38.16464	249.1496	1.002584	4.612622	8.045291
Probability	0.000000	0.000000	0.605748	0.099628	0.017906
Sum	805.5000	15.80000	735.7000	463.5000	4858.090
Sum Sq. Dev.	11183.33	8158.734	1029.096	722.6112	595320.7
Observations	43	43	43	43	43

Source: E-views Output 2023

Table.1 presents descriptive statistics of the variables in the study. The total observations considered in this study were 43 with five variables (one dependent and four independent variables). Inflation Rate (IFR), revealed a mean value of 18.73256 with a minimum of 5.400000 and maximum of 72.80000 while the standard deviation is 16.31778. Furthermore, Real Interest Rate (RIR) revealed a mean value of 0.367442 while minimum reported a value of -65.90000 and maximum of 18.20000 with standard deviation value of 13.93756. Additionally, Lending Interest Rate (LINR), revealed a mean value of 17.10930, while minimum and maximum value are,

8.400000 and 31.60000 with a corresponding standard deviation value of 4.949979. Also, Deposit Interest Rate (DINR), showed a mean value of 10.77907, while both minimum and maximum reported a value of 4.200000 and 23.20000 with standard deviation of 4.147894. Finally, Exchange Rate (EXCR) revealed a mean value of 112.9788 while minimum and maximum reported a value of 0.550000 and 425.9800 with a standard deviation of 119.0559.

Regarding the other variables in the study (Skewness, Kurtosis & Jarque-Bera). The result of skewness showed that RIR, LINR, and DINR are approximately symmetric because its coefficient (-2. 757562, 0.304352, & 0.757538,) is around -0.5 and +0.5. While EXCR and IFR are highly skewed. It coefficient is within 1. On the other hand, kurtosis measures the peakness or flatness of the distribution of a series. Therefore, LINR, EXCR and DINR are mesokurtic because their coefficient is exactly or approximately 3. While IFR and RIR are leptokurtic because their coefficient is greater than 3.The Jarque-Bera measures the difference between the skewness and kurtosis of each of the variables. As regards the Jarque-Bera p-value of the variables; IFR, RIR and EXCR are all less than 0.05. This means that they are not normality distributed while LINR and DINR are all grater than 0.05. This means that they are normally distributed. Therefore, the variables are subjected to unit root test.

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

Variables	Levels		First Difference		Order of Integration	P-value
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value		
IFR	-3.133588	-2.933158			1(0)	0.0316
RIR	-4.747835	-2.933158			1(0)	0.0004
LINR	-2.308124	-2.933158	-5.510039	-2.936942	1(1)	0.0000
DINR	-1.532725	-2.941145	-3.912682	-2.941145	1(1)	0.0046
LEXCR	-2.017060	-2.933158	-5.495842	-2.935001	1(1)	0.0000

Source: Extracts from E-view 10. * Level of significance at 5%

The results of the Augmented Dickey Fuller (ADF) Tests are provided in table 2, and they reveal that the variables that were investigated were subjected to the tests in order to identify whether or not they displayed stationary or non-stationary behavior. According to the findings of the stationarity test, the variables INR and RIR exhibited stationarity after being differenced once, whereas the variables LIR, DIR, and LEXR were stationary at level I(0).The variables in model one display a combination of integrated order or stationarity at both the level and first differences, as determined by the assessments of their stationarity.The results of the stationarity test indicate that the variables INR and RIR exhibited stationarity after being differenced once. It was determined, via the use of initial differencing, that all of the variables included inside model two displayed stationarity

Co-integration Result

Table 3: ARDL Bound Test

Test Statistics	Value	K
F-statistics	5.435559	4

Significance	I (0)	I(1)
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Authors computation from E-view 10 Output

The outcomes of the bound test are shown in Table 3, which depicts a comparison of the F-statistics to the crucial bound value thresholds. A value of 5.435579 is assigned to the F-statistic. According to the findings, the F-statistic surpasses both the lower and upper critical values, which are 2.86 and 4.01, respectively, when the level of significance is set at 0.05. This is shown by the fact that the results suggest that the significance level is 0.05. It suggests that there is some degree of co-integration between Nigeria's interest rate, exchange rate, and inflation rate as a result of their close relationship. As a direct result of this, the anticipated outcomes of both the long-run and the short-run auto-regressive distributive lag (ARDL)

Table 4: ARDL Long-run Result

Variable	Coefficient	Std. Error	t-statistics	Prob
RIR	-1.956030	0.461582	-4.237669	0.0003
LINR	0.297521	0.094797	3.138507	0.0011
DINR	-0.123838	1.944139	-0.063698	0.9498
LEXCR	1.836256	2.964182	0.619481	0.5420
EC = IFR - (-1.9560*RIR + 0.2975*LINR -0.1238*DINR + 1.8363*LEXCR)				

Source: Authors computation from E-view 10 Output

The long-run results of the Autoregressive Distributive Lag (ARDL) model reveal a negative connection between the real interest rate (RIR) and inflation (IFR). Table.4 of the ARDL model presents these findings. There is a negative link between an increase in the Risk Index Rating (RIR) of five percentage points and a decrease in the annual Incidence Fatality Rate (IFR) of one point and one half (1.9 units) per year on average. The negative association that has been found between the real interest rate and inflation is consistent with the conclusion that has been predicted theoretically. According to the p-value, there seems to be a correlation between the infection fatality rate (IFR) and the infection rate (RIR), which shows that the correlation is statistically significant. A statistically significant positive association of +0.297521 was found between lending interest rate (LINR) and inflation (INF) when empirical research was conducted on the subject. According to the findings, an increase in LINR of 5 percentage points is linked to an increase in annual IFR of 0.29 percentage point increase per year. The policy decision made by the government to raise interest rates in order to better control the nation's rising inflation rate is the primary factor behind the positive impact that LINR has on IFR. Despite the fact that the conclusion does not correlate to what was anticipated beforehand, the p-value indicates that lending interest rates have a significant impact on inflation**.**

Analysis of deposit interest rate (DINR) disclose a negative -0.123838 relationship with inflation (IFR). The result signifies that a 5 percent rise in DINR is related to a decrease in annual IFR of 1.83 percent point decrease per year. The negative impact of DINR on IFR is mainly connected to decline in the last five years. The result does not conforms to apriori expectation, the p-value equally shows that deposit interest rate is insignificant with inflation. Finally, examination of the log value of exchange rate (LEXCR) disclose a positive +1.836256 relationship with inflation (IFR). The result signifies that a 5 percent rise in LEXCR is related to an increase in annual IFR of 1.83 percent point decrease per year. The result does not conforms to apriori expectation, the p-value equally shows that log value of exchange rate is insignificant with inflation.

Table 5: ARDL Short-run Result

Variables	Coefficient	Std. Error	t-Statistics	Prob
C	11.88674	3.526629	3.370568	0.0028
D(RIR)	-1.340893	0.195249	-6.867599	0.0000
D(RIR(-1)	0.071994	0.143287	0.502451	0.6203
D(RIR(-2)	0.188736	0.114994	1.641265	0.1150
D(LINR)	2.442261	0.971542	2.513798	0.0198
D(LINR(-1)	0.823657	1.033096	0.797270	0.4338
D(LINR(-2)	1.138031	0.971474	1.171449	0.2540
D(DINR)	-0.904829	0.910282	0.994010	0.3310
D(DINR(-1)	0.621462	0.855176	0.726707	0.4751
D(DINR(-2)	-0.220863	0.956990	-0.230789	0.8196
D(LEXCR)	-5.807328	6.090247	-0.953546	0.3507
D(LEXCR(-1)	-7.461561	6.918067	-1.078562	0.2925
D(LEXCR(-2)	11.90699	6.622223	1.787239	0.0877
ECM(-1)	-0.857778	0.151353	-5.667381	0.0000
Adj R^2 =0.674768, F-statistics = 2.583848 (0.000011), DW =1.947011				

Source: Authors computation from E-view 10 Output

It is clear that the coefficient of the error correction component is big and negative, as shown by the results of the Auto-regressive Distributive Lag (ARDL) model that are presented in the table that is located above. To phrase it another way, the appearance of the negative sign assists to verify the significance of it. It is possible to draw the conclusion that the error correction mechanism (ECM) will be effective in correcting any deviations from the equilibrium that is maintained over the long run. With a value of -0.857778 for its coefficient, the error correction model (ECM) predicts that the rate at which the system adjusts towards long-term equilibrium is 86%. This indicates that the present era will correct any prior deviations from equilibrium that have occurred in the past. As a result of this, it can be deduced that the current value of the Incremental Funding Ratio (IFR) displays a slow reaction to shifts in the Risk-Free Interest Rate (RIR), the Liquidity-Induced Net Return (LINR), the Default-Induced Net Return (DINR), and the Liquidity External

Credit Rating (LEXCR). The results of the ARDL short-run analysis make it abundantly clear that the value of the constant parameter, Bo, is positive and equal to +11.88674. This conclusion may be reached as a consequence of the findings. This suggests that the dependent variable of infection fatality rate (IFR) will grow by 11.9 units on an annual basis even if all of the independent variables will stay the same. The coefficient for the real interest rate, sometimes referred to as the RIR, is -1.340893. This suggests that there is a positive association between the Recovery Index Rate (RIR) and the Infection Fatality Rate (IFR) in the most recent time period. Both of these rates measure the severity of an infection. This conclusion is consistent with the a priori prediction of what would be found. According to the conclusions of the empirical research, there is a correlation between the real interest rate and inflation (INF), and this correlation is positive. To be more specific, there is a correlation between an increase in the real interest rate by one unit and a subsequent increase in inflation of around 1.34 units. It has been shown that there is a significant positive association between the real interest rate and inflation. This correlation has also been proved to be statistically significant.

Additionally, it is important to point out that the lending interest rate (LINR) has a positive value of 2.442261 for the time period covered by the current year. This suggests that there is a link between LINR and IFR that is of a favorable nature. The immediate effect of a one-unit increase in LINR will be a 2.4-unit increase in IFR. This effect will last for the foreseeable future. The result that was produced runs counter to the apriori hypothesis, despite the fact that it does have statistical significance. In addition, it is important to point out that the interest rate on deposits (DINR) had a positive value of +0.621462 during the course of the year before to this one. This gives rise to the conclusion that DINR and IFR are positively correlated with one another. In the short term, a marginal rise in DINR will result in a comparable increase in IFR by 0.62%. This increase will take effect immediately. The result that was actually attained is in line with the conclusion that was predicted, and it displays statistical significance. The logarithmic value of the exchange rate (LEXCR) was recorded as -0.220863 in the current year period and -7.461561 in the year before to this one. This suggests that there is an inverse association existing between LEXCR and IFR. In the short term, a little increase in LEXCR will result in a proportional increase in IFR of 0.22 percent and 7.46 units. This increase will take place immediately. This discovery is compatible with the apriori hypothesis; nonetheless, it does not meet the statistical significance requirements to be considered significant. The breadth of the link was shown by further findings concerning the modified R2 coefficient, which demonstrated a 67% variance in the dependent variable. These findings provided support for the scope of the association. This points to the existence of a connection between the different variables. The relevance of the whole model is shown by the probability value that corresponds to it, which is 0.000011, suggesting that the degree of significance is rather high. According to the value of the Durbin-Watson statistic, which is 1.947011, the series that are being considered do not have any autocorrelation problems. The extensive research indicates that there is a significant connection between Nigeria's interest rates and the country's overall economic progress**.**

Diagnostic Test

Table 6: Ramsey Reset Test, Serial Correlation LM Test and Homoscedasticity Test Results

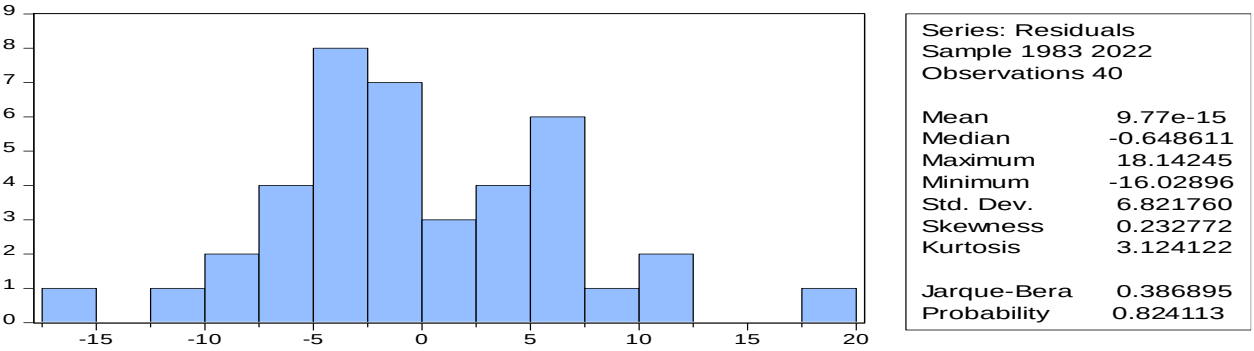
	F-Statistic	Prob.Value

Ramsey Reset Test	18.84855	0.2003
Breusch-Godfrey Serial Correlation LM Test	2.924841	0.0769
Breusch-Pagan-Godfrey Heteroskedasticity Test	0.977107	0.5121

Source: *Author's Computation using E-view 10*

Table 6 presents the data from the diagnostic tests, which reveal that the linearity test of the Ramsey reset test produced a value for the f-statistic that was 18.84855, along with a p-value that was computed to be 0.2003. These findings suggest that the diagnostic tests were successful. The fact that this p-value is higher than the critical value of 0.05 provides strong evidence that the model is correctly specified. As a direct consequence of this, the research concluded that the null hypothesis is not valid. The Breusch-Godfrey Serial Correlation LM test is a statistical approach that is used for the purpose of determining whether or not a regression model has serial correlation. The value of the f-statistic is found to be 1.270066, while the value of the Chi-Square probability is found to be 2.924841, according to the findings of the serial or autocorrelation test. As a consequence of this, the findings of the study indicate that the model does not exhibit serial correlation. This is shown by a probability value of nearly 8% (0.0769), which is more than the threshold value of 5% (0.05). The findings of the Breusch-Pagan-Godfrey test reveal that heteroscedasticity is present since the f-statistic is 0.977107 and the Chi-Square probability value is 0.5121. This indicates that the distribution of the data is not normally distributed. The fact that the computed probability Chi-square value was greater than the cutoff of 5% ($P > 0.05$) indicates that there is no evidence to support the existence of heteroskedasticity within the model. This conclusion is based on the data. As a result, homoscedasticity is present in residuals due to the fact that they have a constant variance. This is an attribute that is desired in regression analysis.

Normality Test



A summary of the normalcy test can be seen in Figure 1. This summary reveals that the Jarque-Bara value is 0.386895, and the probability value that corresponds to this value is 0.824113. This probability value is higher than the 0.05 significance level that was chosen beforehand, which indicates that the residuals follow a normal distribution**.**

Figure 2: Stability Test

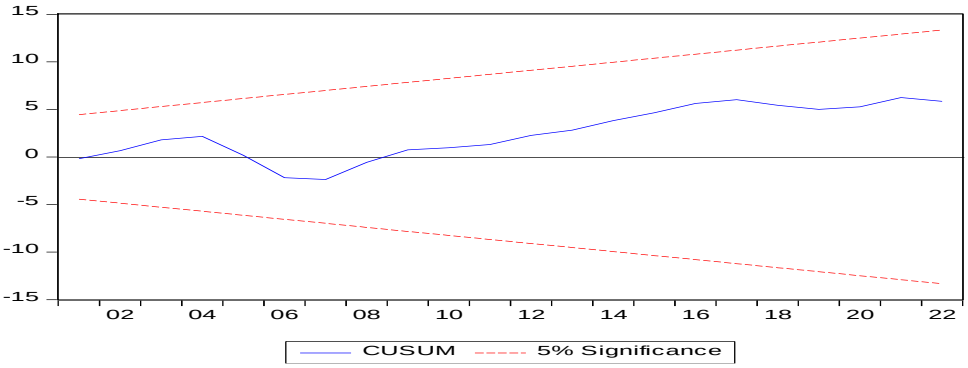


Figure 2 provides a condensed summary of the results of the stability test, which demonstrates that the model is stable on the basis of the data that was collected. It is clear that the blue line is somewhere between the two red lines (-5 and +5), which indicates a level of significance that is more than 0.05**.**

5.0 Conclusion and Recommendations

Conclusion

Inflation, interest rates, and currency exchange rates were all subjected to the scrutiny of this research, which covered the years 1980 through 2022 and focused on their interrelationships. In this particular investigation, the factors that were considered to be independent variables were the real interest rate, the deposit interest rate, the lending interest rate, and the exchange rate. On the other hand, the inflation rate served as a stand-in for the dependent variable in this study. The World Bank's World Development Indicator for the year 2022 served as the primary source for the secondary dates that were included into this analysis. According to the findings of the study, the

real interest rate has a negative but statistically significant association with inflation over prolonged time periods as well as over shorter-term time periods within the current year. This was identified both over longer-term time periods and over shorter-term time periods. In the current year, there is a positive and statistically significant association between lending interest rates and inflation in both the long-run and short-run time periods. This holds true for both the long-run and short-run periods. Furthermore, the study of the connection between deposit interest rates and inflation indicates that while there is a positive link between the two variables, it is not statistically significant in terms of the impact that it had on inflation during the short-term period of the previous year. This is according to the findings of the study that examined the correlation between the two variables. There is an inverse relationship between exchange rates and inflation in the short term, both in the period covering the present year and the period covering the year before it. As a consequence of this, there is a significant relationship between the rates of interest and exchange, as well as inflation, in Nigeria**.**

Recommendations

Based on the findings, the following recommendation were made below;

i. The central bank of Nigeria (CBN) should continue to increase the interest rate in order to slow down the rising inflation rate. Through this means the quantity of money in circulation will reduce thereby reducing the ability of investor's to access sufficient fund.
ii. The monetary policy authority (CBN) should mandate the deposit money banks (DMBs) to increase their interest rate in order to motivate savers to increase savings. This scenario will enable depositors to increase their savings which will help the Dmbs to create investable money.
iii. Finally, the federal government of Nigeria in collaboration with the Central Bank of Nigeria (CBN) should re-examine their policy on exchange rate by improving the productive capacity of the real sector and then adopt a floating exchange rate.

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