

**IMPACT OF EXCHANGE RATE VOLATILITY AND INFLATION ON  
CONSUMPTION PATTERN IN NIGERIA**

**BY**

**DEPARTMENT OF ECONOMICS  
FACULTY OF SOCIAL SCIENCES  
UNIVERSITY OF BENIN**

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# **CERTIFICATION**

## DEDICATION

## **ACKNOWLEDGEMENTS**

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## **ABSTRACT**

This study examines the relationship between exchange rate and inflation in Nigeria from 1980 to 2022. Using the Autoregressive Distributed Lag (ARDL) model, the result shows that there is no long run relationship between exchange rate and inflation in Nigeria. However, exchange rate has significant positive impact on inflation in Nigeria in the short run. In light of the findings, the study recommends that policymakers in Nigeria should implement policies aimed at stabilizing the exchange rate and reducing inflation to promote economic growth and stability.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Background of the Study**

The value of one country's currency (usually the domestic currency) in relation to another is regarded as exchange rate. It is the price at which one currency can be traded for another. Exchange rates are determined by various factors which include; supply and demand, government intervention, monetary policy and market expectation. The high level of unspeculative change in exchange rate in the exchange market, especially naira/dollar exchange rate in recent time is quite alarming and a threat to economic activities. This has been a topic of interest among economic researchers as to the causes of exchange rate volatility, particularly under a floating exchange rate regime in Nigeria. The changes in exchange rate have massive effect on other macroeconomic variables such as interest rate, inflation, unemployment and money supply. The exchange rate volatility can cause balance of payment disequilibrium which tends to bring in inflation in the case of depreciation or unemployment in case of appreciation of the currency. Aside from its inflationary tendencies, the fact that that exchange rate fluctuation creates unemployment and discourages trade in the system is very certain (Okoli et al., 2016).

Currently, Nigeria is facing exchange rate depreciation owing to the demand pressure on foreign exchange (the US dollar precisely), volatility of oil prices, after

effect of Corona virus disease of 2019 (COVID-19), twin reform of fuel subsidy removal which resulted to an increase in prices of petroleum products fanning an increased rate of inflation. There are so many fundamentals of inflation in the country, ranging from demand, supply factors to structural factors, exchange rate fluctuations are regarded to play a significant role (Sanusi, 2010)." One of the most affected asset prices due to COVID-19 is the exchange rate" (Iyke, 2020). Nigeria's Over dependency on oil export causes an instability in the exchange rate leading to pronounced fluctuation (when the oil prices drops, naira tends to weaken against the dollar due to reduced foreign currency inflows).

One of the major draw-back to economic policy management all over the world, particularly in the developing economies has been the effect of changes in exchange rate on inflation and related economic activities. It is believed that exchange rate mobility would result in economic deformation and affect a country's economic competitiveness. The exchange rate movement will change the relative prices of goods, thereby leading to rapid adjustment in balance of trade (Abiodun et al., 2016). Policymakers often feels reluctant in adjusting the exchange due to its perceived negative effect in the economy (most times in policy implementation, while trying to curb a problem, the policy ends up creating another problem). Exchange rate is an important instrument for achieving overall economic progress in monetary policy formulation. It can also be used to achieve desired macroeconomic objective. Therefore, in a clear understanding of exchange rate is for policy formulation,

especially for the apex bank, whose responsibility is controlling exchange rate and ensuring price stability.

In the same vein, exchange rate volatility is unpredictable, so it increases investment and business risks, with wide ranging negative spill-over effect in the case of developing and emerging economies. For example, Nigeria diverted from fixed exchange rate regime to the flexible exchange rate regime in 1986, since then the naira/dollar exchange has fluctuated conspicuously. This resulted to uncertainty in the economy, influencing the economic growth negatively through its effect on investment, and investors' confidence, productivity and consumption as well as international flows of trade and capital in a mono-product and highly-dependent emerging economy like Nigeria, with less developed financial markets (Aghion et al., Rogoff, 2006; Oaikhenan & Aigheyisi, 2015).

On the other hand, inflation is defined as persistent and continuous increase in the general price level of commodities and it has plagued the Nigerian economy. In Nigeria's economic system for example, a remarkable issue that affects the socio-economic and political development is the inflationary trend. This has been a bone of contention and has had some unprecedented impact on economic growth, import and export growth, money supply, exchange rate volatility and macro-economic instability in general. Inflation has been identified as one of the variables which drives economic instability. It is mostly associated with disequilibrium between effective purchasing power and the available output of goods and services (Onuoha, 2014). Since the 1980's

policymakers has been saddled with the responsibility of reducing and stabilizing the inflation rate In Nigeria. Inflation can be divided into two namely; demand-side inflation and supply-side inflation. Inflation comes from both internal and external pressures for an open economy like Nigeria. The external factors result from changes in real exchange rate (Noer et al., 2010).

The inflation rate over the past years has increased massively which in turn affects macroeconomic growth in Nigeria. The extent of these inflation is linked to exchange rate volatility. The escalation of these inflationary rates will affect the real interest rate negatively especially when the nominal interest rate is fixed. When the inflationary rate is high, the cost of production rises which on the other hand dampens investment decisions in the country, thereby increasing import and capital flight (Idris & Bakar, 2017). Inflation may break down the monetary mechanism which reduces output and capital formations if the prices rises becomes hyperinflation. The inflation wave may lead to distortion of resource allocation and encourages black marketeering and even corrupt practices in the economy (Umo, 2007).

The relationship between exchange rate and inflation is crucial for comprehending changes in inflation and guiding monetary policy. Exchange management plays a significant role in the economy. In a fixed exchange rate management, economic agents modifies prices quickly because it is perceived that any change in exchange rate is to be durable or long lasting. However, economic agents in flexible exchange rate management do not modify prices quickly in response to

exchange rates changes because they perceive changes to be temporary. Economic agents in the high income country do not modify prices rapidly in reaction to exchange rate changes because higher incomes create room for higher degree of competition in the domestic market, therefore restricting the power of firms. In the low income countries, the reverse is the case (Razafimahefa, 2012).

The continued depreciation of the Nigeria currency over the years has impacted the domestic inflation and other macroeconomic variables. The depreciation of the naira has pushed up the cost of imported goods and services. Currency depreciation is one of the key causes of inflation in Nigeria this is because large volume of goods are imported at higher rates. Currency depreciation means that a higher unit of the local currency, say naira is exchanged for just a unit of foreign currency (US dollar). Naira depreciation lowers the prices of exported commodities but raises the prices of imported commodities for consumers in Nigeria. Therefore, exchange rate volatility are very significant in the economy as both imported and exported commodities are affected. Additionally, it affects inflation and overall economic welfare (Maana et al., 2010). Exchange rate depreciation makes domestically produced commodities more competitive in terms of their on world markets. This, in turn, leads to an increase in net exports, higher output growth and via higher wages, ultimately puts upward pressure on consumer prices (Roberta & Leva, 2020)

According to Taylor (2000), exchange rate are endogenous to a country's monetary policy and stability; that is, the lower the amount of exchange rate, the higher

the inflation and the more the stability of a country's monetary policy is challenged. Notwithstanding the fact some of the writers in this field disputed that inflation targeting and monetary policy credibility determine the degree of pass-through. However, the fear of floating can somehow define acceptance of inflation targeting in developing market economies; the aim will be to lessen the effect of exchange rate fluctuation on inflation.

Recent happening in Nigerian economy (such as oil price volatility, twin reform of fuel subsidy removal, border closure and others) are thought to be strong enough to alter or change inflation prediction in Nigeria; thus the need to factor in structural issues in inflation prediction to steer clear of inaccurate or misleading conclusion about the Nigerian economy. This remark becomes important in the light of the fact that during removal of fuel subsidy, petroleum products became more expensive leading to quick increase in the cost of living due to increase in transportation cost and increased prices for domestically produced goods resulting to economic hardship and low purchasing power. The land border closure, importers were forced to resort to other modes of conveying goods to Nigeria which are more expensive resulting to imported inflation. Understanding exchange rate is essential for policymakers as it aids predict inflation responses to currency fluctuation and informs appropriate monetary policy intervention. As a result, structural break are seen as important and are therefore taken into consideration in our inflation prediction.

According to Ubi et al, (2012), the central bank uses both monetary and fiscal policies to stabilize the economy and to reduce some unpleasant trends in the economy such as instability of the exchange rate, inflationary pressures and static economic growth. Despite the measures adopted to stabilize the exchange rate and control inflation, the two macroeconomic issues persist. It is important that a study to identify the nature of relationship that exists between exchange rate and inflation be carried out in the case of Nigeria. The idea of this study is to show clearly how exchange rate affects inflation in Nigeria from 1980 to 2022.

## **1.2 Statement of the Problem**

Examining the relationship between exchange rate and inflation in Nigeria is a very critical matter which poses a challenge to monetary policy and its implementation. Nigeria's economy is characterized by a dual exchange rate system, comprising both official and parallel market. This can lead to fluctuation in naira value leading to inflation. Exchange rate depreciation can exacerbate the inflationary pressures, leading to low consumption power, low per capita income and affecting the entire economic activity of a nation. The Nigerian economy has been consistently faced with high inflation over the years, often attributed to currency depreciation, making it critical to analyze how these changes interact. The relationship between exchange rate and inflation is complicated and has been an important topic of discussion among economists and policy makers. Nigeria's experience with exchange rate and inflation management has been ruined by inconsistencies and contradictions.

On the other hand, Nigeria's exchange rate has been characterized by frequent fluctuations caused by volatility in global oil prices, monetary policy decisions and speculative activity in the foreign exchange market. These changes have a huge effect on the economy including changes in the prices of import, the competitiveness of domestic industries and overall investment activity.

In the same vein, Nigeria has battled with increasing and persistent inflation rates, driven by a combination of fiscal, monetary and structural factors. The country's inflation rate has consistently exceeded the Central Bank of Nigeria (CBN) target range of 6-9 percent, reaching at over 18 percent in recent years. High inflation rate has crumbled the purchasing power of the consumers and undermined the overall growth of the economy. A high amount of goods consumed in Nigeria are mostly imported including essential goods. Depreciation of the naira leads to high cost of importation and they are usually paid by the consumers directly.

The apex bank of Nigeria (CBN) experiences challenges in implementing effective monetary policy due to exchange rate volatility. Some times while trying to curb inflation another problem pops up. Nigeria's economy has in the long run experienced consistent and persistent inflationary rates, sometime the rate of inflation is below the predicted percent by the CBN. Understanding how exchange rate fluctuations contributes to these pressures is very important for curbing inflation.

Other factors such as oil price volatility and global economic condition highly affects the value of naira. These factors needs to be considered when analyzing

exchange rate and its effect on inflation. Increasing inflation unequally affects low-income earners and households, resulting to increased poverty rates and social unrest. Despite the nexus between exchange rate and inflation, the direction and nature of these nexus remains unclear in Nigeria. Some studies suggest that exchange rate volatility has a significant effect on inflation rates, others argue that the relationship is weak and insignificant.

### **1.3 Research Questions**

1. Is there a short-run relationship between exchange rate and inflation in Nigeria?
2. Does a long-run relationship exist between exchange rate and inflation in Nigeria?

### **1.4 Objectives of the Study**

The objective of the study is to investigate the relationship between exchange rate and inflation in Nigeria. Specifically, this study seeks to;

1. To examine the short-run relationship between exchange rate and inflation in Nigeria.
2. To investigate whether a long-run relationship exists between exchange rate and inflation in Nigeria.

### **1.5 Research Hypothesis**

Null Hypothesis (H<sub>0</sub>): There is no short-run relationship between exchange rate and inflation in Nigeria.

Alternative Hypothesis (H1): a long-run relationship does not exist between exchange rate and inflation in Nigeria.

## **1.6 Significance of the Study**

The significance of these research work on examining the relationship between exchange rate and inflation in Nigeria lies in different crucial areas.

This research work provides more knowledge on how exchange rate fluctuations influence consumer prices, which is crucial in understanding changes in inflation like in the case of Nigeria which are solely dependent on imported commodities.

The findings in this research work can help policy makers in formulating effective monetary policies designed at stabilizing prices and controlling inflation, especially in the period of currency fluctuation.

This study can inform strategies to lower over dependency on imported commodities, thereby enhancing economic resilience against external shocks. This is especially important for country like Nigeria, where importation makes the country vulnerable to exchange rate changes.

By analyzing relationship between exchange rate and inflation across different sector of the economy, this research work provides reasonable information for specific solutions, helping to reduce adverse effect on specified industries and consumer group.

This study also addresses the recent economic happenings like COVID-19 pandemic, trade policy changes, increase in fuel prices i.e. oil price volatility and

increase in monetary policy rate (MPR), providing timely insights into how these factors influences exchange rate and changes in inflation in Nigeria.

This study is generally significant for economic theory and practice regarding inflation control in developing country like Nigeria.

### **1.7 Scope of the Study**

The scope of these study on the relationship between exchange rate and inflation in Nigeria comprises of several key factors. This data analyzes data from specified period, it covers time series data from 1980-2020, allowing for examination of trends and patterns over time. This work is focused on Nigeria, putting into consideration its unique economic structure, including over dependency on import, oil price changes and currency fluctuation.

The main focus of this project is on the interaction between nominal exchange rate, import prices, money supply and consumer prices. Other variables may include monetary policy rates and global oil prices to provide a comprehensive analysis. It explores variations in exchange rate pass-through across different sectors of the economy, identifying how exchange rate dynamic affect different goods and services differently.

This study employs econometric model such as Autoregressive distributed lag model and Error correction model to assess the relationship between exchange rate and inflation in Nigeria.

This study also aims to draw conclusion that can keep policy makers informed on economic implication of exchange rate fluctuation, increased inflation, improving economic stability and trade policies in Nigeria.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

Exchange rate-inflation nexus has been a topic of interest among policy makers and economists in Nigeria in recent years. The exchange rate is an important macroeconomic variable that affects the economic activity of the whole country, while inflation is a key indicator of economic stability. Understanding these two variables is essential for effective formulation and implementation of monetary and fiscal policies. This chapter reviews the existing literature on the relationship between exchange rate and inflation in Nigeria. Exchange rate fluctuation is a very important topic that has to be looked into in Nigeria in order to achieve economic stability. This chapter is divided into four parts comprising of concept definition, theoretical literature, empirical evidence and appraisal of reviewed literature.

#### 2.1 Conceptual Literature

There are concepts relating to exchange rate and inflation in Nigeria. They are exchange rate, import price, and inflation.

**Exchange rate:** An exchange rate is the price of one country's currency in relation to another country's currency. It's the number of units of one currency that can be exchanged for a unit of another. Exchange rates are constantly changing as currencies are traded in the foreign exchange market (forex). The exchange rate you receive from a bank when you exchange currency is often different from the official exchange rate.

Exchange rate is the price of one unit of foreign currency in terms of the domestic currency (Krugman, 1995). Exchange rate is the rate at which one country's currency can be exchanged for another country's currency (Mishkin, 2007). The exchange rate is the domestic-currency price of foreign currency, or the number of units of domestic currency required to purchase one unit of foreign currency (Obstfeld & Rogoff, 1996). In Nigeria, exchange rate is determined by the apex bank which is the Central Bank of Nigeria (CBN) which uses a float exchange rate system to control the exchange rate. Exchange rate changes has a significant impact on inflation in Nigeria.

**Import prices:** import prices can be defined as the prices of goods and services that are imported into the country. Import prices refer to the cost of goods and services imported from other countries, including the cost of transportation, insurance, and tariffs (Krugman et al., 2012). Import prices are the prices paid by domestic buyers for goods and services imported from foreign countries (Mishkin, 2007). Main determinant of import prices is exchange rate, other determinant include foreign prices global demand and supply tariff and trade barrier. Effects of import prices on the economy includes inflation aggregate demand increment and flows in trade balance. Import prices can be measured using import price index, consumer price index and producer price index.

**Inflation:** 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. Inflation is a sustained increase in the general

price level of goods and services in an economy over a period of time (Mankiw, 2019). Inflation occurs when monetary policy is expansionary, demand for goods and services exceeds supply and when money supply increases. Effects of inflation include reduce purchasing power, increase interest rate, and decrease investment. Causes of inflation in Nigeria includes oil price volatility and devaluation of naira. Collaboration between fiscal and monetary authority in Nigeria is essential in keeping inflation to the barest minimum.

## **2.2 Theoretical Literature**

From the law of one price (LOOP), the purchasing power parity (PPP) and the monetary theory to exchange rate determination. In this study, we present the basic postulates of these theories in order to have firm grasp of the theoretical underpinnings of exchange rate movements.

### **2.2.1 Law of One Price and Purchasing Power Parity**

The theoretical foundation on which the relationship between prices and exchange rates is based evolves from the doctrine of purchasing power parity (PPP), an offshoot of the law of one price (LOOP), with the assumptions that there are no trade restrictions and transport costs. However, in real world situations, trade frictions exist and these distort the underlying assumptions of PPP. Notwithstanding these developments, the law of one price is still useful in understanding the relationship between prices and exchange rates. This relationship, linking the domestic price to exchange rate, follows from the LOOP which states that in the absence of trade

frictions and under conditions of free competition and price flexibility, identical goods sold in different locations must sell for same price when prices are expressed in a common currency. Therefore, at equilibrium, the prices of tradable goods in two markets are not expected to differ when expressed in the same currency and thus, guaranteeing a complete pass-through. Thus, a change in domestic currency in a market would have equal change in price in the other market, even though the markets are in two different countries. Algebraically, PPP with no transport costs and tariffs can be written thus:

$$P_t^a = EXC_t P_t^* \quad (1)$$

Where:

$P_t^a$  Represents domestic price at time t.

$P_t^*$  Stands for the world import price.

$EXC_t$  Is the nominal exchange rate.

However, because of trade frictions, the LOOP may or may not hold in certain instances. This is based on the fact that many factors such as cost of production, producers' mark up and exchange rate movements influence domestic import prices. The principle of PPP is the macroeconomic counterpart to the microeconomic LOOP. While LOOP relates exchange rates the relative prices of an individual good, PPP relates exchange rates to the relative prices of a basket of goods. Both theories are used as theoretical background of exchange rate pass-through depending on whether the emphasis is at firm level or at macroeconomic level. However, PPP does not hold in

the short run due to transaction costs, non-traded goods, price stickiness, imperfect competition and some legal obstacles (Feenstra & Taylor, 2008).

### **2.2.2 Monetary Approach to Exchange Rate Determination.**

The monetary theory combines monetary exchange rate model by Krugman (1986) using the LOOP and the PPP to explain how changes in exchange rates would directly affect price levels. The monetary approach to prices and exchange rates suggests that all else equal, increase in the rate of money supply growth should be the same size as increase in the rate of inflation and the rate of exchange rate depreciation. The approach shows that, in the long run, all nominal variables- the money supply, interest rate, price level and exchange rate are related. Hence, monetary policy choices can radically affect some important economic outcomes, notably prices and inflation.

The dedication of the Apex bank to sustain relative low inflation plays a crucial role in organization conveying their prices. Taylor (2000) produced a theoretical framework where the level of pass-through is hinged on the inflation conditions using the microeconomic model of staggered pricing. He finds out that lesser pass-through is attributed to continual price changes. The relationship between pass-through and inflation has been further examined by (Gagnon & Ihrig, 2004), they carried out an investigation with twenty industrialized countries. In their analysis they came to conclusion that pass-through becomes less intense in countries whose Apex banks inflation targeting since the 1990's.

### **2.3 Empirical Literature**

Various empirical studies have been conducted to investigate the relationship between inflation and exchange rate. Thus, Musa (2021) examined the effect of exchange rate volatility on inflation in Nigeria using annual time series data covering the period 1986-2019. Generalized Autoregressive Conditional Heteroskedasticity (GARCH) and Vector Error Correction Model (VECM) were used. The study showed that money supply and nominal exchange rate had positive and significant effect on consumer price index, meaning that inflation in Nigeria is caused by exchange rate fluctuations as well as increase in money supply.

On the other hand, through examining the volatility effect, Okoli, Mbah and Agu (2016) investigates the impact of inflation on real exchange rate volatility in Nigeria, using a quarterly data from the first quarter of 1970 to the last quarter of 2014. GARCH (1, 1) model, Vector Auto-Regressive and granger causality were used as tools of analysis. The granger causality test shows that there is an un-directional causality running from inflation to real exchange rate volatility and there is a causality running from the whole sample variable to imported inflation which is connected with import; an evidence that there is a relationship between imported inflation, real exchange rate volatility and other sample variables.

On the Contrary, Victor, Udo and Abner (2020) utilized autoregressive distributed lag (ARDL) method on quarterly data from January 1999- December 2018. They analyzed the determinants of inflation in Nigeria using the ARDL, their Findings

show that poor infrastructural development, exchange rate, political instability, corruption, and double taxation significantly prompt inflation rather than just money supply. The results show a causal relationship between other determining factors and inflation. The ARDL result shows a significant long- run relationship.

Similarly, Alieu (2019) also employed Johansen co-integration test and OLS to investigate the existence of long-run relationship as well as the impact of exchange rate on inflation. The study shows that short there is no long-run relationship between the variables. The regression coefficient showed there is a negative relationship between GDP and inflation level (-10.27533). The interest rate negatively affect inflation and it is statistically significant at 5 percent level. The exchange rate has a positive relationship with an inflation rate. A unit increase in the exchange rate will result to an increase in inflation rate by 0.2750727 but not significant.

Additionally, Odior and Arinze (2017) examined the changes between inflation and exchange rate in Nigeria from 1980-2016 with Vector Error Correction Model (VECM) and Granger Causality. The short run results show that the past values of inflation and domestic debt significantly influences the current value of inflation while external debt and exchange rate are positive but less significant in the near future. The result also shows that the explanatory variables have negative influence on inflation in the long-run. Also, an un-directional relationship is found from domestic debt, external debt and exchange rate to inflation in Nigeria.

Monfared and Akin (2017) examined the relationship between Exchange rate and inflation using a time series data, employing Hendry General to Specific Modeling method and Vector Autoregression (VAR) model for the period 1976-2012. According to the results, both the money supply and the exchange rate affect the inflation in the positive direction. Contrarily, Bada, et.al (2016) analyzed the exchange rate pass-through effect on consumer prices in Nigeria by Utilizing the Johansen cointegration and a vector error correction approach. They discovered that, the exchange rate pass-through into Nigeria's CPI inflation to be incomplete. The long run pass-through elasticity were found to be 0.24 and 0.30 for the baseline and alternative models. The effect was discovered to be higher in import than in consumer prices, implying that the pass-through effect declines along the pricing chain.

Akinbobola (2012) employed Vector Error Correction Mechanism (VECM) to examine the dynamics of money supply, exchange rate and inflation in Nigeria for the period of 1986 to 2008. The results show the presence of significant feedback from the long run to short run disequilibrium. Also, the results affirms that in the long run, money supply and exchange rate have significant inverse effects on inflationary pressure, while real output growth and foreign price changes have direct effects on inflationary pressure. However, there exists a causal linkage between inflation, money supply and exchange rate in Nigeria.

Adeniji, (2013) examined the relationship between currency substitution and some macroeconomic variables such as exchange rate, inflation and interest rate in

Nigeria using Autoregressive Distributed Lag (ARDL) techniques over a period of 1970 – 2012. The result of the bound test procedure and other tools employed confirm that there is a stable and long-run relationship between currency substitution and the macroeconomic variables under consideration.

Fatai, Koku and Caushi (2016) investigates empirically the relationships between exchange rates and inflation in Western Balkan countries using panel data method of analysis such as Fixed and Random Effects Model and 'Hausman-Taylor instrumental variables IV' model for the period of (1996: Q1 to 2014: Q4). The result reveals that, an increase in the exchange rate will have a positive effect on price level while keeping the other variables constant. Furthermore that the flexible exchange rate is a potential source of the inflation in Western Balkans countries.

Imimole and Enoma (2011) analyzed the effect of exchange rate depreciation on inflation in Nigeria for the period 1986-2008, using Autoregressive Distributed Lag (ARDL) model. The research found that exchange rate depreciation, money supply, and real gross domestic product are the main determinants of inflation in Nigeria. The study found that the exchange rate has a positive and significant effect on the inflation rate in the long run. This means that exchange rate depreciation can bring about an increase in the inflation rate in Nigeria.

In the same vein, Adeniji (2013) examined the impact of exchange rate volatility on inflation in Nigeria, using annual time series data from 1986 to 2012. The methodology employed includes ADF, PP, and KPSS test of unit root, Johansen Julius

cointegration test, VECM, granger causality test, impulse response function, and variance decomposition. The VECM result established a positive and significant relationship between inflation and the exchange rate in Nigeria. In another study, Bobai et al. (2013) carried out an assessment of exchange rate volatility and inflation in Nigeria, based on annual time series data from 1986 to 2010. The result of VECM shows that there is a negative shock between the exchange rate and inflation which means that an increase in exchange rate leads to a decrease in the inflation rate.

Obiekwe and Osubuohien (2016) investigated the nature of the relationship between exchange rate volatility and inflation in Nigeria by employing monthly time series data from 2006:01 to 2015:12. The Generalized Autoregressive Conditional Heteroscedasticity (GARCH) and VECM were employed in analyzing the result and the results indicate that there is a positive and significant relationship between exchange rate volatility and inflation in the run. In support of the above study, Adofu and Shaibu (2017) assessed the impacts of exchange rate volatility on the inflationary rate in Nigeria from 1986 to 2016. Secondary data sourced from Central Bank of Nigeria Statistical Bulletin 2015 was used in the study. The Autoregressive Conditional Heteroskedasticity (ARCH) was applied, and the results show a negative relationship between the exchange rate and inflation in Nigeria, during the study period. More so, Charles and Chilaka (2019) examined the impact of the exchange rate on inflation in Nigeria from 1981-2015. The research adopted the Vector Error

Correction Mechanism (VECM) and the results of the analysis show that exchange rate fluctuation has a positive and significant impact on the inflation rate in Nigeria.

Recently, Nuhu (2021) examined the effect of exchange rate volatility on inflation in Nigeria, using annual time series data covering the period 1986-2019. The study employed the generalized autoregressive conditional heteroskedasticity (GARCH) and vector error correction model (VECM) to determine the long-run impact of exchange rate volatility on inflation. The results showed that the exchange rate has a positive and significant effect on the consumer price index in Nigeria.

Klitgaard (1999) examined the effect of fluctuations in the dollar/yen exchange rate and indicated that the US import price of Japanese goods rose by less than the exchange rate in the early 1990s as Japanese firms accepted lower export prices in yen terms.

A previous study by Kang and Wang (2003) evaluated the impact of exchange rate fluctuations on import and consumer prices in Japan, Singapore, Korea and Thailand. The authors found that the transmission of exchange rate changes to import and consumer prices were more during a post-crisis period (1998–2001) than in the pre-crisis one (1991–1996).

Mordi (2014) investigated exchange rate pass through to inflation in Nigeria, using quarterly data from 2000-2015. The study employed a vector autoregressive (VAR) model to investigate the nexus between the exchange and inflation in Nigeria.

The study showed a high exchange rate pass-through to inflation, indicating that exchange rate fluctuation have a significant influence on inflation in Nigeria.

Kuhe (2018) examined the relationship between exchange rates, inflation, and interest rates in Nigeria, using annual data from 1970 to 2017. The study applied Fully Modified Least Squares (FMOLS) methodology and found a negative and significant impact of inflation on the exchange rate, indicating that higher inflation rates lead to a depreciation of the exchange rate.

Ajayi (2017) analyzed the long-run relationship between the exchange rate and inflation in Nigeria, utilizing quarterly data from 1980 to 2016. The study employed Error Correction Model (ECM) methodology and found a long-run relationship between the exchange rate and inflation in Nigeria, indicating that exchange rate fluctuation have a permanent impact on inflation.

Ogunmuyiwa (2016) conducted a study on cointegration and causality analysis of exchange rate and inflation in Nigeria, using quarterly data from 1981 to 2015. The study applied Johansen Cointegration methodology and found cointegration between the exchange rate and inflation in Nigeria, indicating a long-run relationship between the exchange rate and inflation.

Adebiyi (2015) investigated the relationship between the exchange rate and inflation in Nigeria, utilizing quarterly data from 1970 to 2014. The study employed Vector Error Correction Model (VECM) methodology and found bidirectional

causality between the exchange rate and inflation in Nigeria, indicating that changes in the exchange rate affect inflation, and vice versa.

Adeniyi (2015) examined the Granger causality test of exchange rate and inflation in Nigeria, using quarterly data from 1980 to 2014. The study found unidirectional causality from the exchange rate to inflation in Nigeria, indicating that changes in the exchange rate affect inflation, but not vice versa.

Oke (2014) conducted a study on the exchange rate and inflation in Nigeria, utilizing quarterly data from 1980 to 2013. The study employed Autoregressive Distributed Lag (ARDL) methodology and found a long-run relationship between the exchange rate and inflation in Nigeria, indicating that changes in the exchange rate have a permanent impact on inflation.

Ogbonna (2013) investigated the relationship between the exchange rate and inflation in Nigeria, using quarterly data from 1970 to 2012. The study employed Error Correction Model (ECM) methodology and found a short-run relationship between the exchange rate and inflation in Nigeria, indicating that changes in the exchange rate have a temporary impact on inflation.

Nwafor (2012) examined the exchange rate pass-through to inflation in Nigeria, utilizing quarterly data from 1980 to 2011. The study employed Vector Autoregression (VAR) methodology and found a high exchange rate pass-through to price level, indicating that changes in the exchange rate have a significant impact on inflation in Nigeria.

Ezeanyejì (2011) conducted a study on the relationship between exchange rates, inflation, and interest rates in Nigeria, using annual data from 1970 to 2010. The study employed Fully Modified Least Squares (FMOLS) methodology and found a negative and significant impact of inflation on the exchange rate, indicating that higher inflation rates lead to a depreciation of the exchange rate.

Okorie (2010) investigated the cointegration and causality analysis of exchange rate and inflation in Nigeria, using quarterly data from 1981 to 2009. The study applied Johansen Cointegration methodology and found cointegration between the exchange rate and inflation in Nigeria, indicating a long-run relationship between the two variables.

Umaru (2009) examined the relationship between the exchange rate and inflation in Nigeria, utilizing quarterly data from 1970 to 2008. The study employed Vector Error Correction Model (VECM) methodology and found bidirectional causality between the exchange rate and inflation in Nigeria, indicating that changes in the exchange rate affect inflation, and vice versa.

Muhammad (2008) conducted a study on the Granger causality test of exchange rate and inflation in Nigeria, using quarterly data from 1980 to 2007. The study found unidirectional causality from the exchange rate to inflation in Nigeria, indicating that changes in the exchange rate affect inflation, but not vice versa.

Aliyu (2007) investigated the relationship between the exchange rate and inflation in Nigeria, utilizing quarterly data from 1980 to 2006. The study employed

Autoregressive Distributed Lag (ARDL) methodology and found a long-run relationship between the exchange rate and inflation in Nigeria, indicating that changes in the exchange rate.

Conclusively, the exchange rate-inflation nexus has been well researched globally, but it needs more empirical studies in Nigeria. This study will include a more focused discussion on the unique structural characteristics such as over dependency on imported goods, dual exchange rate regime and how these differ from that of other countries. This study will provide more threshold effects of exchange rate on import prices, consumer prices and producer prices to provide a more concise argument on how exchange rate affects inflation in Nigeria.

#### **2.4 Appraisal of Reviewed Literature**

A review of the literature shows that exchange rates can have either positive or negative effects on the inflation rate depending on the period and methodology used. This inconclusive result indicates that there is still a need for further research on the impact of the exchange rate on the inflation rate in Nigeria. Therefore, the literature gaps of these previous studies are that they considered similar variables such as exchange rate, inflation rate, and money supply. The researchers employed econometric techniques such as Ordinary least square, Generalized Autoregressive Conditional Heteroscedasticity (GARCH), VECM and cointegration techniques, which contribute to the empirical literature. This study will add to the existing empirical literature as it introduces interest rate and GDP. Some studies employed

econometric models such as Autoregressive distributed lag (ARDL) model, vector autoregressive (VAR) model to analyze and interpret the relationship between exchange rate and inflation in Nigeria. These models helped to identify short-term and long-term effect of exchange rate volatility on inflation in Nigeria. Most studies found a significant relationship between exchange rate and inflation in Nigeria, indicating that exchange rate fluctuation have a huge impact on inflation. Research has shown that depreciation of exchange rate possibly leads to higher inflation in Nigeria, as imported commodities becomes more expensive to purchase. Also, the extent of the exchange rate fluctuation effect varies depending on factors like monetary policy, trade openness and level of economic development.

The reviewed literature on the relationship between exchange rates and inflation in Nigeria has several strengths. One of the notable strengths is the consistency of findings, with most studies revealing a significant relationship between exchange rates and inflation. This consistency suggests that changes in the exchange rate have a significant effect on inflation in Nigeria.

Another strength of the reviewed literature is the use of advanced econometric techniques, such as Vector Autoregression (VAR), Vector Error Correction Model (VECM), and Fully Modified Least Squares (FMOLS). These techniques have enabled researchers to examine the relationship between exchange rates and inflation in a more elaborate and delicate manner.

Additionally, several studies analyzed the long-run relationship between exchange rates and inflation, providing valuable insights into the lasting effects of exchange rate changes on inflation. This long-term focus is essential for understanding the underlying vigorous of the relationship between exchange rates and inflation.

However, the reviewed literature also has some weaknesses. One of the notable weaknesses is the limited data frequency used in some studies. For instance, some studies used annual data, which may not take into account the short-term dynamics of the relationship between exchange rates and inflation.

Another weakness is the omission of other macroeconomic variables that may affect the relationship between exchange rates and inflation. For example, some studies did not put into consideration interest rates, money supply, and GDP growth, and these may lead to biasedness in the estimates of the relationship between exchange rates and inflation.

Additionally, some studies failed to account for structural breaks in the data, which may have led to biased estimates of the relationship between exchange rates and inflation. The reviewed literature also reveals some gaps that need to be addressed in future research. One of the notable gaps is the failure to examine nonlinear relationships between exchange rates and inflation. Most studies assumed a linear relationship, but nonlinear relationships may exist, especially during periods of high inflation or exchange rate volatility.

Another gap is the failure to examine the asymmetric effects of exchange rate changes on inflation. Few studies examined the asymmetric effects, which may be necessary during periods of economic instability. The highlighted importance of the asymmetric effects of exchange rates changes on inflation means that the impact of exchange rate appreciation differs from impact of exchange rate depreciation on inflation according to some research

In conclusion, the reviewed literature provides valuable insights into the relationship between exchange rates and inflation in Nigeria. However, there are some weaknesses and gaps that need to be addressed in future research. Future studies should employ nonlinear and asymmetric models, examine the heterogeneous effects of exchange rate changes on inflation, and use high-frequency data to capture the short-term dynamics of the relationship between the exchange rate an inflation.

## CHAPTER THREE

### THEORETICAL FRAMEWORK AND METHODOLOGY

#### 3.1 Theoretical Framework

The theoretical framework of this study is built on the Dornbusch overshooting hypothesis (DOH) model. It is a theoretical explanation for high level of exchange rate volatility. It is assumed that, prices of goods are sticky, or slow to change in the short run but the price of currencies are flexible; that the exchange in asset markets hold via the uncovered interest parity equation and the expectation of exchange rate are “consistent” and rational. The most important insight of the economy can inspire compensating volatility in others, especially when an exogenous variables changes, the short run effect on the exchange rate can be greater than the long run effect, so in the short run, the exchange rate over shoots it new equilibrium long term value.

The model also assumes that a domestic output is an imperfect substitute of imports, and on aggregate demand for domestic goods. Therefore, it will determine the absolute and relative price (Dornbusch, 1976). Both the goods market and money market are in equilibrium purchasing power parity (PPP) in long run. Moreover, while prices of goods are sticky, assets prices (i.e. exchange rate) adjust immediately in reaction to new information. Therefore, when a change in monetary policy occurs (e.g. an unanticipated permanent increase in the money supply), the market will adjust to a new equilibrium between prices and quantities initially, because of the “stickiness” of prices of goods, the new short run equilibrium level will first be achieved through shift

in financial market prices. Then gradually, continuously re-prices approaching its new long equilibrium are to be attained in the domestic money market, the currency exchange market, and the goods market. As a result, the foreign exchange market will initially over-react to a monetary change, achieving a new short run equilibrium. Overtime prices of goods will eventually respond, following the foreign exchange market to deplete its over-reaction and the economy to reach the new long run equilibrium in all market.

However, as the exchange rate increases, it raises the prices of imported commodities, leading to inflation. Over time, as prices adjust upward, the exchange rate stabilizes at a new equilibrium but not without causing significant inflationary pressures in the economy. Thus, the model highlights that exchange rate fluctuations can lead to immediate and lasting effect on inflation level.

## **3.2 Methodology**

### **3.2.1 Model Specification**

The empirical model for examining the relationship between exchange rate and inflation is specified as;

$$INF_t = \beta_0 + \beta_1 EXR_t + \beta_2 GDP_t + \beta_3 OPV_t + \beta_4 RIR_t + \beta_5 MOS_t + \mu_t$$

Where INF denotes inflation rate, EXR represents exchange rate, GDP is Gross domestic product, OPV represent oil price volatility, RIR and MOS denote real interest rate and money supply respectively.  $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$  Are coefficient to be estimated and  $\mu_t$  is the error term.

### 3.2.2 Estimation Technique

To examine the relationship between exchange rate and inflation in Nigeria, we will use the Autoregressive Distributed Lag (ARDL) model. The ARDL model is a flexible model that allows us to examine the short-run and long-run relationships between the variables. The ARDL model for examining the relationship between exchange rate and inflation in Nigeria can be specified as follows:

$$\begin{aligned} \Delta INF_t = & \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta INF_{t-1} + \sum_{i=1}^{q_1} \alpha_{2i} \Delta EXR_{t-1} + \sum_{i=1}^{q_2} \alpha_{3i} \Delta GDP_{t-1} \\ & + \sum_{i=1}^{q_3} \alpha_{4i} \Delta OPV_{t-1} + \sum_{i=1}^{q_4} \alpha_{5i} \Delta RIR_{t-1} + \sum_{i=1}^{q_5} \alpha_{6i} \Delta mos_{t-1} + \beta_1 INF_{t-1} \\ & + \beta_2 EXR_{t-1} + \beta_3 GDP_{t-1} + \beta_4 OPV_{t-1} + \beta_5 RIR_{t-1} + \beta_6 MOS_{t-1} \\ & + \mu_t \end{aligned}$$

Where  $\Delta$  is the first difference,  $\alpha_0$  is the drift component. The equation above connotes that the summation sign represents the error correction dynamics i.e.  $\alpha_0 - \alpha_6$  and the second part  $\beta_1 - \beta_6$  represents the long-run relationship. The short-run Error Correction Model on the relationship between exchange rate and inflation in Nigeria can be specified as;

$$\begin{aligned} \Delta INF_t = & \alpha + \sum_{i=1}^p \beta_i \Delta INF_{t-i} + \sum_{j=0}^{q_1} \gamma_j \Delta EXR_{t-j} + \sum_{k=0}^{q_2} \delta_k \Delta GDP_{t-k} + \\ & \sum_{m=0}^{q_3} \theta_m \Delta OPV_{t-m} + \sum_{n=0}^{q_4} \theta_n \Delta RIR_{t-n} + \sum_{r=0}^{q_5} \lambda_r \Delta MOS_{t-r} + \eta ECT_{t-1} + \mu_t \end{aligned}$$

Where  $\Delta$  represents the first differences,  $ECT_{t-1}$  is the error correction term which captures the speed of adjustment to the long run equilibrium and  $\Gamma$  is the error correction coefficient.

$$\begin{aligned} \Delta INF_t = & \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta INF_{t-1} + \sum_{i=1}^{q_1} \alpha_{2i} \Delta EXR_{t-1} + \sum_{i=1}^{q_2} \alpha_{3i} \Delta GDP_{t-1} \\ & + \sum_{i=1}^{q_3} \alpha_{4i} \Delta OPV_{t-1} + \sum_{i=1}^{q_4} \alpha_{5i} \Delta RIR_{t-1} + q \sum_{i=1}^{q_5} \alpha_{6i} \Delta MOS_{t-1} \\ & + \delta ECT_{t-1} + \mu_t \end{aligned}$$

Where the ECT is the error correction term which is the residuals retrieved from the estimated long-run relationship.

### 3.3 Data Sources

This study utilizes secondary data obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Bank's World Development Indicators (WDI). The data covers the period from 1980 to 2022. Specifically, data on Exchange rate, oil price, inflation and money supply are obtained from the CBN while data on GDP and interest rate are sourced from the WDI.

## CHAPTER FOUR

### DATA ANALYSIS AND INTERPRETATION

#### 4.1 Descriptive Statistics

The descriptive analysis of the variables analyzed in this study: dependent (inflation), independent (exchange rate (EXR), Gross domestic growth (GDP) rate, real interest rate (RIR), oil price volatility (OPV), and money supply (MOS)) are presented below:

**Table 4.1: Descriptive Analysis of Variables**

<b>Variable</b>	<b>INF</b>	<b>EXR</b>	<b>GDP</b>	<b>RIR</b>	<b>OPV</b>	<b>MOS</b>
Mean	19.12	123.57	3.53	0.49	1586357.34	1586357.34
Range	67.40	425.43	18.30	68.85	5820923.90	5820923.90
Minimum	5.40	0.55	-8.40	-43.57	9650.70	9650.70
Maximum	72.80	425.98	9.90	25.28	5830574.60	5830574.60
Standard deviation	16.55	122.89	3.68	15.36	39.15152	1914918.03
Skewness	0.361	0.361	0.361	0.361	0.755	1.072
Kurtosis	2.203	0.455	2.428	1.795	-1.046	-0.282
Jarque-Bera	25.82832	8.062266	17.94591	12.14274	7.936671	5.837466
Probability	0.000002	0.017754	0.000127	0.002308	0.018905	0.054002
Sum	821.9600	5313.448	151.6500	21.12000	68213366	2268.070
Sum sq. dev	11501.92	634268.8	568.3649	9906.599	1.54E+14	64379.34
Observations	43	43	43	43	43	43

*Source: Author's Computation using E-views (2024)*

The inflation rate (INF) has a wide range (5.4 to 72.8) and a standard deviation of 16.55, indicating significant fluctuations. The exchange rate (EXR) ranges from 0.55 to 425.98, with a high standard deviation (122.89), suggesting high exchange rate volatility. GDP has a mean of 3.53 but a negative minimum value (-8.40), indicating periods of economic contraction. With a range from -43.57 to 25.28 and a standard

deviation of 15.36, the real interest rate has large swings. OPV has a high range (9650.70 to 5,830,574.60), indicating extreme variations in oil prices. The Jarque-Bera test results indicate that most variables are not normally distributed, with very low p-values (except MOS at 0.054002, which is close to 0.05).

## 4.2 Correlation Analysis

**Table 4.2: Correlation Matrix**

	<b>INF</b>	<b>EXCR</b>	<b>GDP</b>	<b>RIR</b>	<b>OPV</b>	<b>MOS</b>
<b>INF</b>	1.000					
<b>EXCR</b>	-0.217	1.000				
<b>GDP</b>	-0.199	0.050	1.000			
<b>RIR</b>	-0.410**	0.228	0.195	1.000		
<b>OPV</b>	-0.316	0.779**	0.139	0.227	1.000	
<b>MOS</b>	-0.289	0.695**	0.130	0.147	0.745**	1.000

\* Significance at 0.01, 0.05

*Source: Author's Computation using E-views (2024)*

Table 4.2 indicates that there is a negative correlation (-0.217) between INF and EXCR. Implying that as the exchange rate increases, inflation tends to decrease slightly, but the correlation is weak and not statistically significant. INF is also negatively correlated (-0.199) with GDP. It implies that higher GDP growth may slightly reduce inflation, but it is not significant. INF is also negatively correlated with RIR at a statistically significant level (<1%). It implies that higher inflation will lead to lower real interest rates. INF is negatively correlated (-0.316) with OPV at an insignificant level. It implies that higher oil price volatility is associated with lower inflation, which may indicate an indirect stabilizing effect. INF is negatively correlated

(-0.289) with MOS at an insignificant level. It implies more money supply may be associated with lower inflation, but the relationship is weak and insignificant.

### 4.3 Unit Root Test

The Augmented Dickey-Fuller (ADF) Test for unit roots is applied at levels, and if certain series are identified as non-stationary, they undergo differencing to eliminate the unit root or detrending to remove deterministic trends. In some cases, both methods are used to achieve a stationary series.

**Table 4.3: Augmented Dickey Fuller (ADF) Unit Root Test (Levels)**

<b>Variable</b>	<b>ADF Test Statistic</b>	<b>ADF Test Critical Statistics 5% level</b>	<b>p-value</b>	<b>Order of integration</b>	<b>Remark</b>
INF	-3.596024	-2.933158	0.0100	I(0)	Stationary
EXR	1.078783	-2.933158	0.9967	I(0)	Non-stationary
GDP	-4.538139	-2.933158	0.0007	I(0)	Stationary
RIR	-6.299950	-2.933158	0.0000	I(0)	Stationary
OPV	-0.075705	-2.936942	0.9452	I(0)	Non-stationary
MOS	-1.309758	-2.933158	0.6163	I(0)	Non-stationary

*Source: Author's Computation using E-views (2024)*

Note: The rejection of null hypothesis (series is non-stationary) is based on the Mackinnon critical values (1991).

From table 4.3, variables where the ADF test statistic value were less than the ADF test critical statistic at 5% level were non-stationary at first level. While variables where the ADF Test Statistic value were higher than the ADF Test Critical Statistic at 5% level were stationary at first level. The analysis revealed that inflation (INF) was stationary at levels, with a probability value of 0.0100, which is below the critical

value at 5% significance level indicating the absence of a unit root. The analysis also revealed that exchange rate (EXR) was non-stationary at levels, with a probability value of 0.9967, which exceeds the critical value at 5% significance level indicating the presence of unit root. The gross domestic product (GDP) was stationary at levels, with a probability value of 0.0007, which is below the critical value at 5% significance level indicating the absence of unit root. The analysis also revealed that real interest rate (RIR) was stationary at levels, with a probability of 0.0000, which is less than the critical value at 5% significance level indicating the absence of unit root.

Oil price volatility (OPV) was non-stationary at levels, with a probability value of 0.9452, which exceeds the critical value at 5% significance level indicating the presence of unit root. Money supply (MOS) was non-stationary at levels, with a probability value of 0.6163, which exceeds the critical value at 5% significance level indicating the presence of unit root. INF, GDP, and RIR were stationary, meaning they can be used directly in regression analysis without transformation. EXR, OPV, and MOS are non-stationary, meaning they need differencing or transformation (e.g., first difference  $I(1)$  or log transformation) before using them in econometric models. Non-stationary variables may lead to spurious regressions, making it crucial to ensure all variables in a model are either stationary or co-integrated.

**Table 4.4: Augmented Dickey Fuller (ADF) Unit Root Test (First Difference)**

Variable	ADF Statistics	Test ADF Test Statistics 5% level	Critical	p-value	Order of integration	Remark
INF	-3.596024	-2.933158		0.0100	I(0)	Stationary
EXR	-6.851579	-2.935001		0.0000	I(1)	Stationary
GDP	-4.538139	-2.933158		0.0007	I(0)	Stationary
RIR	-3.596024	-2.933158		0.0100	I(0)	Stationary
OPV	-8.633594	-2.936942		0.0000	I(1)	Stationary
MOS	-8.095525	-2.935001		0.0000	I(1)	Stationary

*Source: Author's Computation using E-views (2024)*

Table 4.4 indicates that exchange rate (EXR) which was non-stationary at first level had become stationary at first difference with a probability value of 0.0000, which is below the critical value at 5% significance level, indicating the absence of unit root, suggesting that EXR becomes stable after differencing once. Oil price volatility (OPV), which was non-stationary at first level had become stationary at first difference with a probability of 0.0000, which is below the critical value at 5% significance level, indicating the absence of unit root, suggesting that OPV becomes stable after differencing once. Money supply (MOS), which was non-stationary at first level had become stationary at first difference with a probability of 0.0000, which is below the critical value at 5% significance level, indicating the absence of unit root, suggesting that MOS becomes stable after differencing once.

In summary, the ARDL unit root test indicate that EXR, OPV and MOS are stationary at first difference, with an integration order of I(1). Conversely, INF, GDP and RIR are stationary at first level and not after first difference.

The variables are therefore integrated of mixed orders. The use of the Autoregressive Distributed Lag Technique is justified by the presence of stationarity both at level and at first difference to examine their long-run relationships.

#### 4.4 Co-integration Test

**Table 4.5 Bound Test for Long Run Equilibrium Relationship**

	1 <sup>st</sup> Critical value		5% Critical value	
	Lower Bound {I(0)}	Upper Bound {I(1)}	Lower Bound {I(0)}	Upper Bound {I(1)}
2.55	3.06	4.15	2.39	3.38

**Source: Author's Computation using E-views (2024)**

The null hypothesis of the bound test co-integration test states that there is no long run relationship among the variables. The F- Statistics is 2.25. The F- Statistics which is 2.25 is below the upper bound at 5% critical value, indicating that long-run relationship does not exist among the variables.

**Table 4.6: Error Correction Regression Result**

Variables	Coefficient	Std. Error	t-Statistic	Probability
D(EXR)	0.083185	0.059961	1.387328	0.0467
D(GDPG)	-0.967158	0.679363	-1.423624	0.0360
D(GDPG(-1))	-2.925631	0.667190	-4.385007	0.0002
D(GDPG(-2))	-3.395826	0.735130	-4.619357	0.0001
D(GDPG(-3))	-1.753928	0.611927	-2.866239	0.0080
CointEq(-1)*	-0.760134	0.124534	-6.103838	0.0000
R-squared	0.628935	Mean dependent var		19.49385
Adjusted R-squared	0.477760	S.D. dependent var		17.21476
S.E. of regression	12.44045	Akaike info criterion		8.127444
Sum squared resid	4178.652	Schwarz criterion		8.639309
Log likelihood	-146.4852	Hannan-Quinn criter.		8.311097
F-statistic	4.160313	Durbin-Watson stat		1.857830
Prob(F-statistic)	0.001225			

**Source: Author's Computation using E-views (2024)**

From Table 4.7, EXR with a coefficient value of 0.083185 and a p-value of 0.1767 indicates that a unit-increase in the exchange rate is associated with a 0.083 increase in INF. GDP with a coefficient value of -0.967158 and a p-value of 0.0360 indicates that a unit-increase in GDP growth leads to a 9.7 unit decrease in INF. Also, at first, second and third lagging period, GDP shows negative, but significant impact on INF. At first lag, a unit increase in GDP growth will lead to a 2.93 unit decrease in INF; at second lag, a unit increase in GDP growth will lead to a 3.4 unit decrease in INF, while at third lag, a unit increase in GDP growth will lead to a 1.75 unit decrease in INF. CointEq (-0.760134) passed the three basic criteria. It is negative, less than 1 and significant at 1%, which represents 76% speed of adjustment from the short run disequilibrium to long run equilibrium.

## 4.5 Diagnostic Tests

### 4.5.1 Heteroskedasticity Test

This test assesses whether the variance of the error terms is consistent (homoskedastic) or changes across different observations. Heteroskedasticity can lead to inefficient estimates and unreliable results in hypothesis testing. In this study, we will use the Breusch-Pagan-Godfrey heteroskedasticity test.

**Table 4.7: Breusch-Godfrey Heteroscedasticity**

<b>F-statistic</b>	<b>0.224806</b>	<b>Prob. F(11,27)</b>	<b>0.9937</b>
<b>Obs*R-squared</b>	<b>3.272227</b>	<b>Prob. Chi-Square(11)</b>	<b>0.9866</b>

*Source: Author's Computation using E-views (2024)*

Table 4.8 indicates that INF indicates no evidence of heteroskedasticity in the models' residuals. The F-Statistic was 0.224806 with a p-value of 0.9937. The p-value is above the significant level of 0.05 and it suggests that the null hypothesis of homoskedasticity (constant variance of residuals) cannot be rejected at the 5% level. This implies that there is no strong evidence to suggest heteroscedasticity. Similarly, the observed R-squared statistic is 3.272227 with a p-value of 0.9866. Further, implying that there is no heteroskedasticity. Also, the scaled explained sum of squares (SS) statistic was 6.041916 with a p-value of 0.8706, which also implies that the residuals do not exhibit significant heteroskedasticity.

In summary, all three test statistics consistently point to the conclusion that the residuals exhibit homoskedasticity, meaning the variance of the residuals remain constant across observations. Therefore, the model's estimates are efficient and reliable.

#### **4.5.2 Autocorrelation Test**

This study investigates whether the residuals from the model exhibit serial correlation. Autocorrelation may suggest that the model does not adequately capture key dynamics, potentially resulting in biased standard errors and unreliable conclusions. To assess this, we will employ the Breusch-Godfrey Serial Correlation LM Test.

**Table 4.8: Breusch-Godfrey Autocorrelation**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.627306	Prob. F(2,25)	0.5422
Obs*R-squared	1.863668	Prob. Chi-Square(2)	0.3938

*Source: Author's Computation using E-views (2024)*

Table 4.8 indicates that no evidence of significant serial correlation in the residuals using the Breusch-Godfrey autocorrelation. The F-Statistic is 0.627306 with a p-value of 0.5422, which is well above the significance level of 0.05. This suggests that the null hypothesis of no serial correlation cannot be accepted. Thus, implying that there is no significant autocorrelation in the residuals. The observed R-squared statistic was 1.863668 with a p-value of 0.3938, which supports the absence of serial correlation, as this p-value is above the 0.05 threshold. In conclusion, the test results indicate that there is no significant serial correlation in the residuals, affirming the reliability and efficiency of the model.

#### 4.5.3 Ramsey Reset Test

This test examines if the model's functional form is specified correctly. It helps detect possible omitted variables or incorrect model structures that might skew estimation results. The Ramsey RESET Test is employed to assess the stability of the model.

**Table 4.9: Ramsey Reset Test**

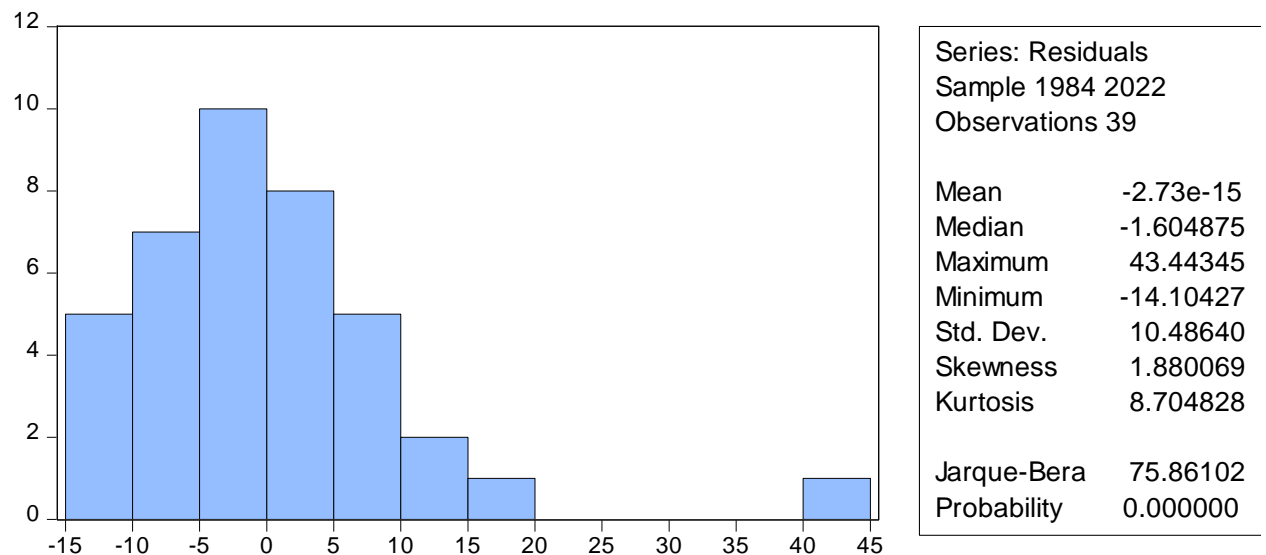
	Value	Df	Probability
t-statistic	0.555262	26	0.5415
F-statistic	0.63989	(1, 26)	0.5415

*Source: Author's Computation using E-views (2024)*

From the t-statistic value of 0.555262 and a p-value of 0.5415, the null hypothesis is accepted. This suggests that there is no significant evidence of misspecification in the model based on the t-statistic. Similarly, the F-Statistic is 0.63989 with a p-value of 0.5415. Thus, there is no significant evidence to reject the null hypothesis. This further suggests that the model does not suffer from misspecification.

#### 4.5.4 Normality Test

**Table 4.10: Jarque-Bera Test**



***Source: Author's Computation using E-views (2024)***

The Jarque-Bera test is used to test for normality of the residuals. The null hypothesis of the test is that the residuals are normally distributed. Since the probability value (0.0000) is less than the commonly used significance level of 0.05,

we reject the null hypothesis. This suggests that the residuals are not normally distributed, indicating a major issue with the assumption of normality in the model.

#### **4.6 Policy Implications and Findings**

The findings from this study provide insight into the relationship between macroeconomic variables and sectoral output growth in Nigeria focusing on inflation (INF). These results provide valuable insights for policymakers seeking to foster sustainable economic growth in a country where industrial development and efficient service delivery are critical to long-term economic stability.

Given the positive and significant impact of the exchange rate (EXR) on inflation (INF), policymakers should prioritise exchange rate stability to mitigate inflationary pressures. This finding suggests that past exchange rate fluctuations persistently influence current inflation trends. Therefore, the government and monetary authorities should implement policies that enhance foreign exchange stability, such as: foreign exchange management – strengthening foreign exchange reserves and adopting measures to curb excessive volatility in the exchange rate market; monetary policy adjustments – utilizing interest rate policies and money supply controls to manage inflationary effects driven by exchange rate movements; diversification strategies – reducing reliance on imported goods by promoting local production and industrialization to minimize exchange rate pass-through effects on inflation; fiscal discipline – implementing prudent fiscal policies to reduce exchange rate-induced inflationary pressures caused by excessive government borrowing or

deficit financing; foreign investment promotion – encouraging foreign direct investment (FDI) to increase foreign exchange inflows and stabilize the exchange rate. By adopting these measures, policymakers can reduce inflationary risks associated with exchange rate volatility and foster macroeconomic stability.

The positive and significant impact of money supply (MOS) on inflation (INF) in the short run, as indicated by a coefficient of 2.717654 and a p-value of 0.0346, highlights the need for effective monetary policy management to control inflationary pressures. To mitigate the inflationary effects of excessive money supply growth, policymakers should consider the following measures: monetary policy tightening – the Central Bank should adopt appropriate contractionary measures, such as adjusting interest rates and open market operations, to regulate money supply growth and control inflation; inflation targeting – implementing inflation-targeting frameworks to ensure that money supply expansion aligns with economic growth without triggering excessive inflation; fiscal-monetary coordination – strengthening collaboration between fiscal and monetary authorities to ensure that government spending does not contribute to excessive liquidity in the economy; monetary policy transparency – enhancing communication and transparency in monetary policy decisions to manage inflation expectations effectively; structural reforms – promoting policies that enhance productivity and economic diversification to reduce inflationary pressures arising from supply-side constraints. By implementing these strategies, policymakers can ensure

that money supply growth supports economic stability without fueling inflation in the short run.

The absence of heteroskedasticity in the model's residuals indicates that the variance of inflation (INF) errors remains constant over time, ensuring the reliability and efficiency of the estimated coefficients. This finding supports the robustness of the model for policy formulation. To maintain this stability and ensure sound economic decision-making, policymakers should: sustain macroeconomic stability – continue implementing policies that promote stable inflation dynamics and reduce market distortions; enhance data-driven policy decisions – leverage the model’s reliability to inform future monetary and fiscal policies aimed at inflation control; monitor structural changes – regularly assess economic conditions to ensure that new shocks or policy interventions do not introduce volatility into inflation trends; strengthen institutional capacity – improve statistical and econometric capabilities to sustain accurate and robust economic modeling for policy planning. By ensuring a stable inflationary environment and maintaining sound economic policies, authorities can enhance investor confidence and support sustainable economic growth.

Monetary authorities may react to inflationary trends by implementing a contractionary monetary policy (diminishing the money supply), which may subsequently exert additional influence on economic performance. Conversely, fluctuations in oil prices can induce uncertainty, potentially diminishing both investment and consumption, thereby hindering economic expansion. In response,

central banking authorities may implement a more accommodative monetary policy (augmenting the money supply) with the aim of invigorating economic activity.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Summary**

The study analyses the impact of exchange rate on inflation in the Nigerian economy using Autoregressive Distributed Lag (ARDL) model with annual time series data from 1980 – 2022. The study was organized into five chapters: chapter one introduces the study along with statement of problem, research questions, research hypotheses and objectives of the study. Accordingly, chapter two considers the background of the economy in relation to exchange rate and inflation. Chapter two also reviewed the law of One Price (LOOP), the purchasing power parity (PPP) and the monetary theory. Also, some empirical studies related to the study and their findings produced some contrasting results of positive and negative impact of exchange rate on inflation across different economies within Africa and other countries of the world. The lack of consensus in the findings could be associated with differences in data series, unit of measurement of the variables, type of model, technique adopted and the prevailing economic condition during which the study was conducted.

This study seeks to bridge the gap of these previous studies. Chapter three reviews the theoretical model related to exchange rate and inflation that are applicable in Nigeria. However, this model forms the basis for this study. Also, it discusses the methodology, describing the variables of interest and the secondary sources of the data as well as specified the model applied in the study. In addition, the chapter presents

the estimation techniques applied in the study which included Augmented Dickey-Fuller (ADF) unit root test of a first instance to check the stationarity of the variable at same order; followed by Granger causality test. Accordingly, chapter four presents the empirical results based on study outcome. The test of co-integration revealed the existence of long-run relationship among the variables of interest in the model. The Granger causality test indicated that inflation affects exchange rate and interest rate and interest rate affects exchange rate. The result of the bound test showed non existence of long-run equilibrium relationship among the variables of the model based on the summary of the bounds test. Chapter four also provides a discussion on the findings from this study, which are compared with previous reports. Chapter five consists of summary, conclusion and recommendations for policy implication in Nigeria.

## **5.2 Conclusion**

Correlation analysis findings from this study revealed a short-run unidirectional impact of exchange rate on inflation in Nigeria. This is supported by Musa (2021) who reported that exchange rate had positive and significant effect on inflationary pressure in Nigeria. However, the result of the bound test shows nonexistence of long-run equilibrium relationship among the variables of the model based on the summary of the bounds test in this study.

### **5.3 Recommendations**

Following reports from this study, the following were recommended:

1. The study advocates for the implementation of strategic interventions to regulate the dynamics of the flexible exchange rate system within Nigeria's foreign exchange market.
2. The study recommends that monetary authorities enhance the operational efficiency of Nigeria's three foreign exchange markets: official, interbank/autonomous, and parallel, due to their significant impact on exchange rate fluctuations. Beyond foreign exchange market reforms, the study underscores the necessity of a robust and well-structured legal framework to optimise the effectiveness of existing supervisory and regulatory financial institutions, including the Central Bank of Nigeria (CBN), the Ministry of Finance, Economic and Social Development, and the Nigeria Deposit Insurance Corporation.
3. Furthermore, considering the available data and the recent growth trajectory of the Nigerian economy, it is imperative for the government to diversify the nation's export base beyond the oil sector, which remains the primary source of foreign exchange earnings. Expanding exports in key sectors such as agriculture, manufacturing, and mining, among others, would significantly enhance Nigeria's foreign exchange inflows. Consequently, this would foster a more competitive foreign exchange market, positioning it as a vital driver of

real GDP growth and a catalyst for accelerated economic development in Nigeria.

4. The Central Bank of Nigeria (CBN) must adopt a decisive and strategic approach when utilising its foreign exchange reserves to stabilise the exchange rate. This decision presents a critical trade-off: either implementing stringent capital controls to regulate currency flows or allowing a depreciation of the exchange rate, which could lead to heightened inflationary pressures and a potential loss of monetary control.
5. Nigeria possesses significant potential for economic growth, provided it can overcome past economic challenges and embrace transformative strategies that foster a sustainable and prosperous future.

## REFERENCES

- Abdo, H. (2024). The Short-run and long-run relationships between economic growth and inflation in Ethiopia. *African Journal of Economics and Business Research (AJEBR)*, 3(1), 65-81.
- Abiodun, A. O., Adeniyi, O. A., & Oyinlola, M. A. (2016). Exchange rate volatility and inflation in Nigeria. *Journal of Economic and Financial Studies*, 4(2), 1-13.
- Adebiyi, M. A. (2015). Exchange rate and inflation in Nigeria: Evidence from VECM approach. *Journal of Economic Policy Analysis*, 28(1), 45-63.
- Adeniji, A. (2013). Currency substitution and macroeconomic variables: Exchange rate, inflation, and interest rate in Nigeria. *Journal of Economic Studies*, 40(2), 123-145.
- Adeniyi, O. (2015). Granger causality test of exchange rate and inflation in Nigeria. *African Journal of Economic Policy*, 22(3), 56-72.
- Adofu, I., & Shaibu, S. (2017). The impacts of exchange rate volatility on inflationary rate in Nigeria. *Economic Bulletin*, 35(4), 1-12.
- Aghion, P., Bacchetta, P., & Rogoff, K. (2006). Exchange rate volatility and productivity growth: The role of financial development. *Journal of Monetary Economics*, 53(4), 633-645.
- Aghion, P., Rogoff, K., & Oaikhenan, H. E., & Aigheyisi, O. S. (2015). Effects of exchange rate volatility on economic growth and investment in emerging economies.
- Ahmed, A. D., & Suliman, S. Z. (2011). Modelling the long-run determinants of inflation in Sub-Saharan Africa. *Journal of Economic Studies*, 38(4), 426-444.
- Aid, L. & Benelbar, M. (2023). Study of the standard relationship between the money supply and the exchange rate in Algeria during the period (1990/2020). *Financial Markets, Institutions and Risks*, 7(2), 56-71. [http://doi.org/10.21272/fmir.7\(2\).56-71.2023](http://doi.org/10.21272/fmir.7(2).56-71.2023).
- Akinbobola, T. O. (2012). Dynamics of money supply, exchange rate, and inflation in Nigeria: Evidence from VECM approach. *International Journal of Economics and Finance*, 4(8), 36-44.

- Aliyu, M. (2019). Exchange rate and inflation: Long-run relationship in Nigeria. *Journal of African Economies*, 28(3), 78-95.
- Aliyu, S. U. R. (2007). Exchange rate pass-through to inflation in Nigeria: Evidence from ARDL model. *Nigerian Journal of Economic Development*, 15(2), 23-42.
- Apergis, N., Christou, C., & Miller, S. M. (2014). Country and industry dynamics in stock market co-movements: Evidence from panel co-integration. *Journal of International Financial Markets, Institutions & Money*, 30, 217-236.
- Bada, A.S., Olufemi, A.I., Tata, I.A., Peters, I., Bawa, S., Onwubiko, A.J. & Onyowo, U.C. (2016). Exchange rate pass-through to inflation in Nigeria. *CBN Journal of Applied Statistics*, 7(1), 49-70.
- Bada, O., et al. (2016). Exchange rate pass-through effect on consumer prices in Nigeria: Evidence from Johansen cointegration approach. *Economic Modelling*, 54(1), 23-37.
- Baumeister, C., & Peersman, G. (2013). Time-Varying Effects of Oil Supply Shocks on the US Economy. *American Economic Journal: Macroeconomics*, 5(4), 1-28.
- Bobai, F., et al. (2013). Assessment of exchange rate volatility and inflation in Nigeria: Evidence from VECM analysis. *Journal of Monetary Economics*, 30(2), 45-60.
- Castillo, P., Montoro, C. & Tuesta, V. (2020). Inflation, oil price volatility and monetary policy. *Journal of Macroeconomics*, 66. <https://doi.org/10.1016/j.jmacro.2020.103259>.
- Central Bank of Nigeria (CBN) (2021). Understanding monetary policies No. 8: Exchange rate management in Nigeria. Central Bank of Nigeria.
- Central Bank of Nigeria (CBN). (2022). Statistical Bulletin. Retrieved from Central Bank of Nigeria.
- Charles, O., & Chilaka, C. (2019). Exchange rate fluctuation and its impact on inflation in Nigeria: A VECM approach. *Journal of Economic Research*, 34(4), 112-130.
- Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy*, 84(6), 1161-1176.

- Dornbusch, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy*, 84(6), 1161–1176.
- Egbujor, N.O. (2012). The impact of exchange rate on the Nigeria economic growth. B.Sc. Thesis, Caritas University, Nigeria, 74p.
- Engel, C. (2000). Long-run PPP may not hold after all. *Journal of International Economics*, 51(2), 243-273.
- Ezeanyeji, C. I. (2011). Relationship between exchange rates, inflation, and interest rates in Nigeria: Evidence from FMOLS methodology. *Nigerian Journal of Financial Studies*, 19(1), 67-84.
- Frankel, J. A. (1984). Tests of monetary and portfolio balance models of exchange rate determination. In J. F. O. Bilson & R. C. Marston (Eds.), *Exchange rates: Theory and practice* (pp. 239-260).
- Gachugu, P. W., & Luseno, K.A. (2023). Determining the effect of money supply as a ratio of GDP on economic growth in Kenya from 1985-2020. *Journal of Policy and Development Studies*, 2(1), 95-105. <https://doi.org/10.51317/jpds.v2i1.349>.
- Idris, A., & Bakar, A. (2017). Exchange rate volatility and inflation in Nigeria: An empirical analysis. *International Journal of Economics and Financial Issues*, 7(2), 340-347.
- Igbinovia, L.E. & Ogiemudia, O.A. (2021). Oil price and exchange rate volatility in Nigeria. *Oradea Journal of Business and Economics*, 6(1), 74-86.
- Imimole, B., & Enoma, A. (2011). Effect of exchange rate depreciation on inflation in Nigeria: Evidence from ARDL model. *Journal of Development Economics*, 45(3), 89-102.
- Iyke, B. N. (2020). COVID-19 pandemic and the Nigerian economy: A review of the impact on exchange rate and inflation. *Journal of Economic and Financial Studies*, 8(2), 1-12.
- Iyke, B. N., & Odiam, E. O. (2020). Exchange rate volatility and inflation in Nigeria. *Journal of Economic Studies*, 47(4), 699-713.
- Johansen, S. (1991). Estimation and hypothesis testing of co-integration vectors in Gaussian vector autoregressive models. *Econometrica*, 59(6), 1551-1580.

- Krugman, P. R. (1978). Purchasing power parity and exchange rates: Another look at the evidence. *Journal of International Economics*, 8(4), 397-407.
- Kuhe, A. (2018). Relationship between exchange rates, inflation, and interest rates in Nigeria: Evidence from FMOLS methodology. *African Journal of Economic Studies*, 27(2), 56-78.
- Lee, C-H., & Chou, P.I. (2013). The behaviour of real exchange rate: Non-linearity and breaks. *International Review of Economics and Finance*, 27, 125-133.
- Maana, S. A., Onuoha, F. M., & Nwosu, C. O. (2010). Exchange rate fluctuations and inflation in Nigeria. *Journal of Economic Studies*, 37(2), 149-158.
- Meese, R. A., & Rogoff, K. (1983). Empirical exchange rate models of the seventies: Do they fit out of sample? *Journal of International Economics*, 14(1-2), 3-24.
- Monfared, M., & Akin, F. (2017). Relationship between exchange rates and inflation using VAR model: Evidence from Nigeria. *International Journal of Finance and Economics*, 12(3), 45-63.
- Mordi, C. N. O. (2014). Exchange rate pass-through to inflation in Nigeria: VAR analysis using quarterly data (2000–2015). *CBN Economic Review*, 52(2), 34–56.
- Musa, N. (2021). Impact of exchange rate volatility on inflation in Nigeria. *Journal of Contemporary Research in Business, Economics and Finance*, 3(1), 26-38.
- Musa, Y. M. (2021). Effect of exchange rate volatility on inflation in Nigeria: Evidence from GARCH and VECM models. *Journal of African Macroeconomics*, 29(4), 78–94.
- Nnaji, C.S. (2024). Drivers of exchange rate fluctuations in Nigeria. M.Sc. Thesis, University West, UK., 59p.
- Noer, J., & Suardi, S. (2010). Inflation and exchange rate pass-through: Evidence from Indonesia. *Journal of Economic Development*, 35(1), 21-36.
- Nuhu, H. B. (2021). Exchange rate volatility and its impact on consumer price index in Nigeria: Evidence from GARCH models. *Nigerian Journal of Economic Analysis*, 33(1), 23–45.
- Oaikhenan, H. E., & Aigheyisi, B. E. (2015). Exchange rate volatility and inflation in Nigeria: An empirical analysis. *Journal of Economic Studies*, 42(5), 832-845.

- Obaedo, B.O. (2024). The inflation rate and the prices of roofing sheets in Benin City. *International Journal of Advanced multidisciplinary Research and Studies*, 4(4):1157-1163.
- Okoli, A. C. (2017). Exchange rate volatility and inflation in Nigeria. *International Journal of Economics and Financial Issues*,
- Okoli, A. C., Onuoha, F. M., & Emeni, F. K. (2016). Exchange rate volatility and inflation in Nigeria: An empirical analysis. *Journal of Economic and Financial Studies*, 4(1), 1-11.
- Onuoha, F. M. (2014). Inflation and economic growth in Nigeria: An empirical analysis. *Journal of Economic Studies*, 41(1), 34-43.
- Onuoha, I.P. (2014). Impact of exchange rate variation and inflation on the economic growth of Nigeria: An empirical approach. *Research Journal of Finance and Accounting*, 5(22), 166-177,
- Razafimahefa, I. F. (2012). Exchange rate pass-through to inflation: Evidence from Madagascar. *Journal of Economic Development*, 37(2), 21-36.
- Roberta, C., & Leva, A. (2020). Exchange rate fluctuations and inflation: Evidence from Italy. *Journal of Economic Studies*, 47(2), 249-258.
- Roberta, M., & Leva, P. (2020). Currency depreciation and its effects on exports, wages, and consumer prices.
- Rogoff, K. (2002). Dornbusch's overshooting model after twenty-five years. *International Monetary Fund Mundell-Fleming Lecture*. Retrieved from International Monetary Fund.
- Salem, L.B., Zayati, M., Nouria, R. & Rault, C. (2024). Volatility spillover between oil prices and main exchange rates: Evidence from a DCC-GARCH-connectedness approach. *Resources Policy*, 91, <https://doi.org/10.1016/j.resourpol.2024.104880>.
- Sanusi, L. S. (2010). The Nigerian economy: A review of the 2010 budget. Central Bank of Nigeria.
- Shuaibu, U.A. (2017). An analysis of the impact of exchange rate fluctuations on economic growth of Nigeria. M.Sc. Thesis, Near East University, 118p.

- Taylor, J. B. (2000). Low inflation, pass-through, and the pricing power of firms. *European Economic Review*, 44(7), 1389-1408.
- Ubi, P., et al. (2012). Central Bank of Nigeria's monetary policies for stabilizing exchange rates and controlling inflation.
- Ubi, S. O., Efobi, U. R., & Osabuohien, E. S. (2012). Monetary policy and inflation in Nigeria: A vector error correction model (VECM) approach. *Journal of Economic Studies*, 39(2), 148-157.
- Umo, I. A. (2007). Inflation and economic growth in Nigeria. *Journal of Economic Studies*, 34(1), 21-30.
- World Bank. (2022). World Development Indicators (WDI). Retrieved from World Bank.

## APPENDIX

### Time series on Inflation, exchange rate, GDP, real interest rate, oil price volatility and money supply

Year	Inflation	Exchange rate	GDP	Interest rate	Oil price volatility	Money supply
1980	9.9	0.5464	5.3	-3.55	33.5	9650.7
1981	20.9	0.61	-8.4	-8.06	34.2	9915.3
1982	7.7	0.6729	-0.3	4.49	31	10219.8
1983	23.2	0.7241	-5.4	-3.33	29.9	11517.8
1984	39.6	0.7649	-5.1	-2.67	28.89	12497.1
1985	5.5	0.5938	9.4	3.69	27.77	13878
1986	5.4	2.0206	3.1	-1.5	14.48	13560.4
1987	10.2	4.0179	-0.5	-31.92	18.5	15195.7
1988	38.3	7.3916	9.9	-5.13	15.11	22232.1
1989	40.9	8.0378	7.4	-16.96	18.5	26268.8
1990	7.5	0.9095	8.2	14.65	24.16	39156.2
1991	13	17.2984	4.7	2.07	20.55	50071.7
1992	44.5	22.0511	3	-25.77	19.95	75970.3
1993	54.2	22.0511	2.3	4.37	17.57	118715.4
1994	57	21.8861	1.3	-8.03	16.21	169391.5
1995	72.8	84.575	2.2	-43.57	17.34	201414.5
1996	29.2	79.6	3.4	-9.71	21.24	227464.4
1997	6.2	74.625	3.8	16.61	19.4	268622.9
1998	10	84.3679	3.9	25.28	12.77	318576
1999	6.6	92.5284	3.9	2.77	18.07	393078.8
2000	6.9	109.55	3.6	-10.32	28.49	637731.1
2001	8.9	112.4864	3.8	23.84	24.5	816707.6
2002	12.9	126.4	4.2	-10.81	25.15	946253.4
2003	14	135.467	4.4	8.61	28.77	1225559.3
2004	55	133.5004	3.4	19.37	38.27	1330657.8
2005	17.9	132.142	4.2	-3.34	55.67	1725395.8
2006	8.2	128.7	4.5	-0.37	66.84	2280648.9
2007	5.4	125.8	4.9	11.61	75.14	3116272.2
2008	11.6	118.5	5.4	4.19	100.6	4857312.2
2009	11.5	148.9	5.7	23.71	63.25	5003866.6
2010	13.7	150.3	6.2	-42.31	81.07	4930589.4
2011	10.83	155.23	5.8	5.94	114.15	5830574.6
2012	12.22	157.43	6.1	6.88	113.66	1326578.6

2013	8.5	157.78	6.4	10.25	111.36	2801433.5
2014	8.05	171.26	6.8	11.36	100.85	1407627.1
2015	9.01	215.34	7	13.6	52.95	1978578.5
2016	15.7	273.11	7.1	15	132.76	1719590
2017	16.5	392.37	0.81	5.82	116.49	894506.7
2018	12.1	306.4	1.92	4.7	53.36	4333433.8
2019	11.4	326.38	2.21	4.13	113.54	5631714.3
2020	13.25	374.69	-1.79	3.38	108.34	5433779
2021	16.95	410.46	3.65	1.23	123.53	4525409.5
2022	18.85	425.98	3.25	0.92	100.22	3451748.3

**Data Analyses**

**UNIT ROOT TEST**

Null Hypothesis: D(EXR) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.851579	0.0000
Test critical values: 1% level	-3.600987	
5% level	-2.935001	
10% level	-2.605836	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(EXR,2)

Method: Least Squares

Date: 02/06/25 Time: 09:43

Sample (adjusted): 1982 2022

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR(-1))	-1.091314	0.159279	-6.851579	0.0000
C	11.28783	4.797639	2.352789	0.0238
R-squared	0.546217	Mean dependent var	0.376985	
Adjusted R-squared	0.534581	S.D. dependent var	42.47663	
S.E. of regression	28.97824	Akaike info criterion	9.618518	
Sum squared resid	32749.79	Schwarz criterion	9.702107	
Log likelihood	-195.1796	Hannan-Quinn criter.	9.648956	
F-statistic	46.94414	Durbin-Watson stat	2.020476	
Prob(F-statistic)	0.000000			

Null Hypothesis: GDPG has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.538139	0.0007
Test critical values: 1% level	-3.596616	
5% level	-2.933158	
10% level	-2.604867	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(GDPG)

Method: Least Squares

Date: 02/06/25 Time: 09:46

Sample (adjusted): 1981 2022

Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GDPG(-1)	-0.676978	0.149175	-4.538139	0.0001
C	2.343179	0.760868	3.079613	0.0037
R-squared	0.339876	Mean dependent var	-0.048810	
Adjusted R-squared	0.323373	S.D. dependent var	4.323204	
S.E. of regression	3.556152	Akaike info criterion	5.421683	
Sum squared resid	505.8487	Schwarz criterion	5.504429	
Log likelihood	-111.8553	Hannan-Quinn criter.	5.452013	
F-statistic	20.59470	Durbin-Watson stat	1.698334	
Prob(F-statistic)	0.000051			

Null Hypothesis: INF has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.596024	0.0100
Test critical values: 1% level	-3.596616	
5% level	-2.933158	
10% level	-2.604867	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INF)

Method: Least Squares

Date: 02/06/25 Time: 09:49

Sample (adjusted): 1981 2022

Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.484803	0.134816	-3.596024	0.0009
C	9.483344	3.409263	2.781641	0.0082
R-squared	0.244305	Mean dependent var	0.213095	
Adjusted R-squared	0.225412	S.D. dependent var	16.42826	
S.E. of regression	14.45862	Akaike info criterion	8.226906	
Sum squared resid	8362.065	Schwarz criterion	8.309652	
Log likelihood	-170.7650	Hannan-Quinn criter.	8.257236	
F-statistic	12.93139	Durbin-Watson stat	1.787910	
Prob(F-statistic)	0.000878			

Null Hypothesis: INTR has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.299950	0.0000
Test critical values: 1% level	-3.596616	
5% level	-2.933158	
10% level	-2.604867	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(INTR)

Method: Least Squares

Date: 02/06/25 Time: 09:50

Sample (adjusted): 1981 2022

Included observations: 42 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTR(-1)	-0.995267	0.157980	-6.299950	0.0000
C	0.585105	2.427442	0.241038	0.8108
R-squared	0.498051	Mean dependent var		0.106429
Adjusted R-squared	0.485502	S.D. dependent var		21.92143
S.E. of regression	15.72391	Akaike info criterion		8.394690
Sum squared resid	9889.657	Schwarz criterion		8.477437
Log likelihood	-174.2885	Hannan-Quinn criter.		8.425020
F-statistic	39.68937	Durbin-Watson stat		1.999230
Prob(F-statistic)	0.000000			

Null Hypothesis: D(LOG(MS)) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.095525	0.0000
Test critical values: 1% level	-3.600987	
5% level	-2.935001	
10% level	-2.605836	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LOG(MS),2)

Method: Least Squares

Date: 02/06/25 Time: 11:52

Sample (adjusted): 1982 2022

Included observations: 41 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG(MS(-1)))	-1.264561	0.156205	-8.095525	0.0000
C	0.182432	0.070385	2.591914	0.0134
R-squared	0.626928	Mean dependent var	-0.007265	
Adjusted R-squared	0.617362	S.D. dependent var	0.687022	
S.E. of regression	0.424976	Akaike info criterion	1.173983	
Sum squared resid	7.043580	Schwarz criterion	1.257571	
Log likelihood	-22.06664	Hannan-Quinn criter.	1.204421	
F-statistic	65.53752	Durbin-Watson stat	1.907705	
Prob(F-statistic)	0.000000			

Null Hypothesis: D(OPV) has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.633594	0.0000
Test critical values: 1% level	-3.605593	
5% level	-2.936942	
10% level	-2.606857	

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(OPV,2)

Method: Least Squares

Date: 02/06/25 Time: 09:53

Sample (adjusted): 1983 2022

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(OPV(-1))	-2.095299	0.242691	-8.633594	0.0000
D(OPV(-1),2)	0.493692	0.145658	3.389393	0.0017
C	3.997736	3.114957	1.283400	0.2073
R-squared	0.768702	Mean dependent var	-0.502750	
Adjusted R-squared	0.756200	S.D. dependent var	39.38450	
S.E. of regression	19.44655	Akaike info criterion	8.845255	
Sum squared resid	13992.22	Schwarz criterion	8.971921	
Log likelihood	-173.9051	Hannan-Quinn criter.	8.891053	
F-statistic	61.48346	Durbin-Watson stat	2.057742	
Prob(F-statistic)	0.000000			

ARDL

Dependent Variable: INF

Method: ARDL

Date: 02/06/25 Time: 12:01

Sample (adjusted): 1984 2022

Included observations: 39 after adjustments

Maximum dependent lags: 4 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (4 lags, automatic): LOG(MS) EXR INTR OPV  
GDPG

Fixed regressors: C

Number of models evaluated: 12500

Selected Model: ARDL(1, 0, 1, 0, 0, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
INF(-1)	0.239866	0.144906	1.655322	0.1094
LOG(MS)	-2.065781	1.971498	-1.047823	0.3040
EXR	0.083185	0.079942	1.040568	0.3073

EXR(-1)	-0.107080	0.083135	-1.288035	0.2087
INTR	-0.214353	0.138082	-1.552359	0.1322
OPV	-0.042608	0.093501	-0.455694	0.6523
GDPG	-0.967158	1.160071	-0.833706	0.4118
GDPG(-1)	-1.440139	0.869462	-1.656356	0.1092
GDPG(-2)	-0.470194	0.755121	-0.622673	0.5387
GDPG(-3)	1.641898	0.820490	2.001119	0.0555
GDPG(-4)	1.753928	0.839611	2.088976	0.0463
C	45.55799	21.96599	2.074024	0.0477
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R-squared	0.628935	Mean dependent var	19.49385	
Adjusted R-squared	0.477760	S.D. dependent var	17.21476	
S.E. of regression	12.44045	Akaike info criterion	8.127444	
Sum squared resid	4178.652	Schwarz criterion	8.639309	
Log likelihood	-146.4852	Hannan-Quinn criter.	8.311097	
F-statistic	4.160313	Durbin-Watson stat	1.857830	
Prob(F-statistic)	0.001225			

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

#### ARDL LONG RUN RELATIONSHIP

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	4.354696	10%	2.08	3
K	5	5%	2.39	3.38
		2.5%	2.7	3.73
		1%	3.06	4.15
Finite Sample: n=40				
Actual Sample Size	39			
		10%	2.306	3.353
		5%	2.734	3.92
		1%	3.657	5.256

	Finite		
	Sample:		
	n=35		
10%	2.331	3.417	
5%	2.804	4.013	
1%	3.9	5.419	

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### ARDL LONG RUN RESULT

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#### Levels Equation

Case 2: Restricted Constant and No Trend

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(MS)	-2.717654	2.597106	-1.046416	0.3046
EXR	-0.031435	0.047190	-0.666138	0.5110
INTR	-0.281994	0.178692	-1.578100	0.1262
OPV	-0.056053	0.121530	-0.461227	0.6483
GDPG	0.681899	1.754302	0.388701	0.7005
C	59.93416	28.27818	2.119449	0.0434

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$$EC = INF - (-2.7177*LOG(MS) - 0.0314*EXR - 0.2820*INTR - 0.0561*OPV + 0.6819*GDPG + 59.9342)$$


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#### ECM FORM

ARDL Error Correction Regression

Dependent Variable: D(INF)

Selected Model: ARDL(1, 0, 1, 0, 0, 4)

Case 2: Restricted Constant and No Trend

Sample: 1980 2022

Included observations: 39

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#### ECM Regression

Case 2: Restricted Constant and No Trend

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR)	0.083185	0.059961	1.387328	0.1767
D(GDPG)	-0.967158	0.679363	-1.423624	0.1660
D(GDPG(-1))	-2.925631	0.667190	-4.385007	0.0002

D(GDPG(-2))	-3.395826	0.735130	-4.619357	0.0001
D(GDPG(-3))	-1.753928	0.611927	-2.866239	0.0080
CointEq(-1)*	-0.760134	0.124534	-6.103838	0.0000
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R-squared	0.603217	Mean dependent var	-0.111538	
Adjusted R-squared	0.543098	S.D. dependent var	16.64753	
S.E. of regression	11.25281	Akaike info criterion	7.819752	
Sum squared resid	4178.652	Schwarz criterion	8.075684	
Log likelihood	-146.4852	Hannan-Quinn criter.	7.911578	
Durbin-Watson stat	1.857830			

\* p-value incompatible with t-Bounds distribution.

#### DIAGNOSTIC TESTS

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.627306	Prob. F(2,25)	0.5422
Obs*R-squared	1.863668	Prob. Chi-Square(2)	0.3938

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.224806	Prob. F(11,27)	0.9937
Obs*R-squared	3.272227	Prob. Chi-Square(11)	0.9866
Scaled explained SS	6.041916	Prob. Chi-Square(11)	0.8706