



**NEAR EAST UNIVERSITY  
INSTITUTE OF GRADUATE STUDIES  
DEPARTMENT OF BANKING AND FINANCE**

**THE IMPACT OF THE EXCHANGE RATE, INTEREST RATE  
ON NIGERIAN ECONOMIC DEVELOPMENT (1980–2019)**

**MSc. THESIS**

**CLARENCE DM ZOKER**

**Nicosia  
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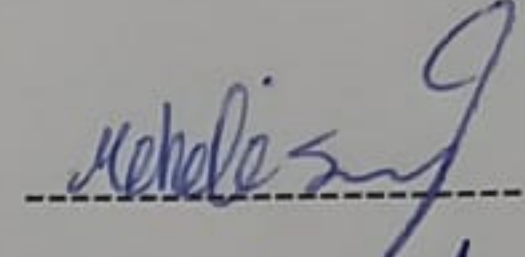
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We attest to having read the thesis submitted by **CLARENCE DM ZOKER**

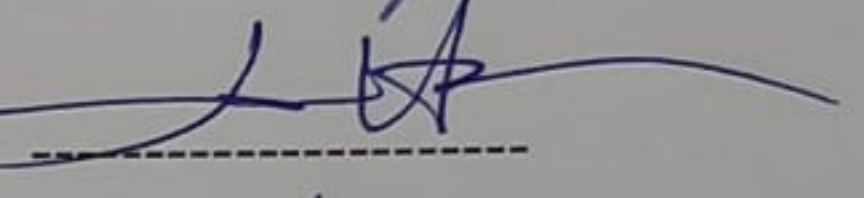
titled **“the impact of the exchange rate, interest rate on Nigeria economic development (1980-2019)** In addition, we are of the view that it fulfils all of the requirements, both in terms of its breadth and its level of quality, to be a thesis for the Master of Social Sciences degree.

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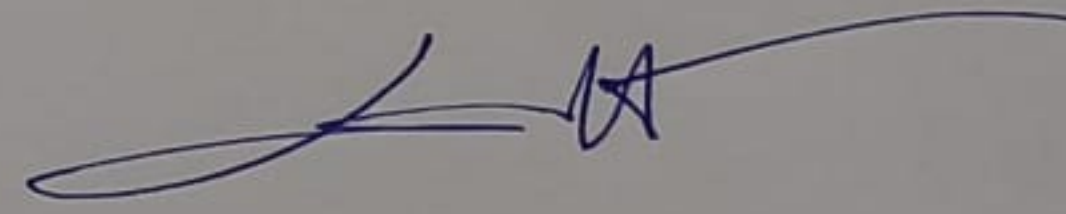


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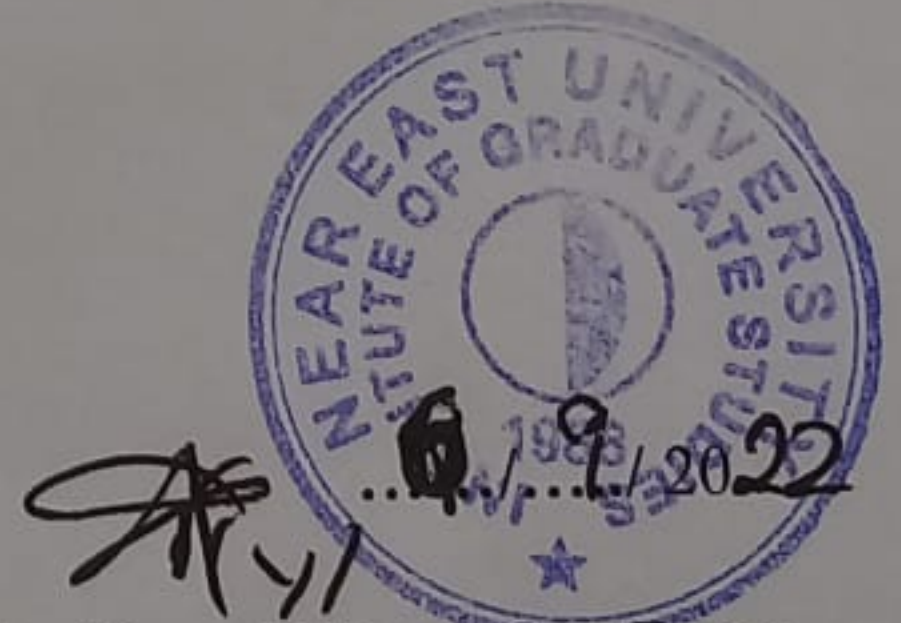
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## **Declaration**

I, the undersigned, hereby certify that all of the materials, documents, analysis, and findings included within this thesis have been gathered and presented in accordance with the academic regulations and ethical principles of the Institute of Graduate Studies at Near East University. I further declare that, in accordance with these rules and conduct, I have thoroughly cited and referenced any material and data that are not unique to this research. This statement was made so that these rules and conduct could be followed.

**CLARENCE DM ZOKER**

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## Abstract

The impact of the exchange rate, Interest rate on Nigerian economic development (1980–2019)

The intention of this research is to study the link between the exchange rate and economic growth in Nigeria from 1980 to 2019, utilizing secondary data from World Bank Indicators. Augmented Dickey Fuller and Philips-Perron techniques were used to guarantee that the series' unit root was appropriately evaluated. Using yearly time series data from 1980 to 2019, the thesis used the ARDL model with bound testing rather than the standard Johansen cointegration methodology to capture both long-run cointegration and short-run dynamics of the connections and also the Granger Causality Test. Annual time series data from 1980 to 2019 was utilized. The outcomes of the cointegration tests demonstrated that the exchange rate had a positive influence on the Nigerian economy in both the long and short periods. The study's objectives include researching the operation of the exchange rate as well as the evolution of Nigeria's GDP growth. To explore the relationship between the Nigerian exchange rate and the country's economic development, calculate the exchange rate's effect on Nigeria's economic growth. The goal of this research is to find solutions to regulate the Nigerian currency's appreciation. In Nigeria, the currency rate has an influence on both short-term and long-term economic development. Policymakers should implement measures to maintain a steady inflation rate. Investors should use their investments to hedge against inflation and, as a consequence, help the economy grow more broadly.

**Key words:** Investments, Inflation, Exchange rate, Coefficient, Policymakers, Nigeria, GDP growth.

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**ABBREVIATIONS**

**ADF:** Augmented Dickey-Fuller

**ARDL:** Auto Regressive Distributed Lag

**BM:** Broad Money

**CBN:** Central Bank of Nigeria

**DAS:** Dutch Auction System

**ECM:** *error correction model*

**ER:** Exchange rate

**FEER:** Fundamental Equilibrium Exchange Rate

**FDI:** foreign direct investment

**GDP:** Gross Domestic Product

**IFE:** International Fisher Effect

**IMF:** International Monetary Fund

**IRP:** Interest Rate Parity

**OCA:** optimum currency area

**OLS:** ordinary least square

**OTC:** *over-the-counter*

**PPP:** *Purchasing power parity*

**QIB:** Qualified Institutional Buyer

**REER:** Real Effective Exchange Rate

**RIR:** Real Interest Rate

**SAP:** systems, applications, and products.

**SDRS:** *Special Drawing Rights*

**VAR:** vector autoregressive models

**SEC:** Securities and Exchange Commission

**WDAS:** wholesale Dutch auctions System

## **CHAPTER ONE**

### **1.1 Introduction**

According to the International Monetary Fund, an exchange rate is the value of one dollar in relation to the currencies of other countries or economic zones.

Gold holdings, foreign stocks or derivatives markets, domestic assets in the form of bank accounts, and special borrowing rights (SDRs) are the core aspects of foreign reserves (Prasad and Raju,2010).

Following the breakup of the Bretton Woods agreement in 1973, there was a surge in demand for significant sums of held foreign reserves, which has intensified in subsequent years.

A large percentage of the world's nations (particularly emerging markets such as Nigeria) have experienced extreme real exchange rate liquidity, indicating a high level of uncertainty in achieving main economic and financial policy objectives such as market stability and economic growth. Historically, uncertainty in the comparative pricing of an economy has been associated with volatile real exchange rates. The currency rate must remain constant in order for foreign portfolio investments, stable prices, and long-term economic development to take place, among other things.

Notwithstanding a very extensive body of work in this field, economists and financial specialists, especially in developing countries, continue to be interested in studies on exchange rate management. Since the rate of exchange is not just the important financial value of one currency expressed in terms of something else that connects locally and

globally the exchange of goods, services, and investments, but also the economic development of a nation in a world market with the rest of the world, this is partly due to how important the rate of exchange is in the global market.

This even acts as a long-term anchor for maintaining appropriate financial balances. No one knows for sure what causes the equilibrium real exchange rate, and it's one of the most difficult empirical problems in macroeconomics to solve (Williamson, 1994).

The control of exchange rates, commonly known as "getting the exchange rate right," is a tough macroeconomic policy task. There is strong consensus in developing-country policy circles that the ultimate objective of exchange rate regulation should be to decrease chronic imbalances, which is a pervasive issue in the majority of developing nations. To avoid misunderstandings, it is important to figure out the equilibrium real exchange rate, which is still a big problem in RER research today.

According to numerous hypotheses, a nation with a fixed or controlled floating exchange rate system is thought to have more currency in reserve than a state with a completely flexible exchange rate system. The central bank intervenes in global markets to build systems that guarantee the currency rate is stable and sustainable under a fixed or controlled floating exchange rate regime (Choi and Gwan, 2004).

Foreign currency reserves rise whenever there is a huge market for national currency in a world market and collapse when there is a huge quantity of national currency in an international economy, which implies that foreign currency reserves are a waste product held by a country after the country's foreign exchange liabilities have been paid off (Prabheesh et al., 2007b and Edwards et al., 1984).

Despite the Bretton Woods system's demise in 1973, several nations adopted a flexible exchange rate regime, permitting capital account reform in emerging market economies and resulting in a considerable growth in foreign currency reserves. Developing market countries that open their capital account have a good idea of how much money they'll have when they have more foreign currency reserves.

According to Morana (2009), economic variables and the exchange rate are intertwined. Bidirectional causality may be shown in both of the cases above. The causation from macroeconomic factors to exchange rate fluctuation was greater than the inverse, he did add. However, Adom et al. (2012) examined the impact of market demands, supply shocks, and financial shocks on the exchange rate in 13 West African nations. Their calculations revealed that genuine demand shocks account for a substantial portion of trade flows. They said that cutting government spending and taxes was a good way to keep prices down.

Capital inflows, which are one of the fundamentals governing the real exchange rate, play a crucial role in setting the balance of real exchange rate. Huge capital inflows, according to the Dutch Disease hypothesis (Corden and Neary, 1982), cause the exchange rate to increase in real terms owing to their influence on both the trade and non-trade segments of the economy. The magnitude of appreciation as a consequence of capital inflows, on the other hand, is highly determined by the inflow's degree of redox potential. " There are some inflows that are more susceptible to reversal (or are more likely to be linked to outflows) than others. This means that they have different outcome on government income and on the real exchange rate of the country.

On the one hand, capital reform led to higher capital inflows, which reflected the amount of foreign reserves; on the other hand, these dangerous and short-run flows seriously affected the exchange rate industry; these discrepancies contentiously reduced the value of emerging economies, resulting in regression capital flows and currency devaluation; most countries increased their density of state quality of foreign currency reserves after the 1990s; and banking meltdowns, because regression capital flows and currency crises were common. Accruing a huge number of foreign exchange reserves, as per (Akdogan 2010) and (Mendoza 2004), is an ego motive for unusual changes in the economy, even though accumulating a high level of foreign exchange reserves settles the exchange rate and the exchange rate revalues the exchange rate.

Foreign currency market changes involve costs for individuals, corporations, and the government. According to Benita and Lauterbach (2004), when the exchange rate changes, it can have a big impact on pricing stability, business profitability, and the stability of a country.

Given the resource foundation of the Nigerian economy, the country's foreign investment strategy should turn toward seeking and promoting increased inflows of foreign money. The country's undeveloped economy has hindered its economic growth, necessitating the need for foreign direct investment (FDI). In general, the Nigerian government's foreign investment policy is based on two main goals: economic independence and economic growth.

Because of some of the structural shifts need, such as lower imports or higher non-oil exports, exchange rate strategies in developing economies are often complex and contentious, meaning a reduction in the nominal exchange rate. Domestic changes are



seen as harmful to the economy because of their short-term impact on prices and demand. People think it's weird that rising countries that rely on imports for both consumption and production don't talk about the problems that come with an overvalued exchange rate system. The focus has switched to the extent of currency volatility in the face of internal and external shocks. There seems to be broad agreement that depreciation or devaluation may improve domestic production by encouraging the net export component. Domestic businesses are becoming more competitive internationally, which has led to a shift in spending away from imported goods whose prices have gone up and toward goods made in the United States instead. According to Guitan (1976) and Dornbusch (1988) The effectiveness of currency depreciation in improving the balance of trade is mostly dependent on shifting demand in the right direction and in the right amount, in proportion to the national economy's capacity to fulfil the increased competition by manufacturing more goods. Exchange rate fluctuations are likely to impact influence on the overall performance of the economy. It is necessary to investigate the impact of currency fluctuations on the development of production and the pricing of goods. Because of this, the goal of this research is to explore the influence of exchange rate variations on Nigeria's economic development in the short term. The probable direct and indirect correlations between the variables have been thoroughly researched. Nigerian econometric research on the exchange rate and production fluctuations have been undertaken by Egwaikhide and colleagues (1994), Ekpo (2004), and Akinlo and Odusola (2001), to name a few. Nigeria's exchange rate policy has changed substantially ever since, especially during the post war era, since 1982, when the government maintained a fixed parity with the British pound, the country has seen a series of economic booms, culminating in the currency's capital increase in 1986, after the country's relatively tight economic tie with the United

Kingdom during that era of 1982 to 1985. The exchange rate policy of a nation has a significant influence on a variety of factors, including the economy, inflation, the balance of trade, and real income of that country, among others. This is true for each of the epochs mentioned above.

The objectives of exchange rate policy are to select an acceptable exchange rate while also ensuring that it remains stable. To attain these objectives, efforts have been undertaken throughout the years employing a variety of strategies and alternatives to boost the efficiency of the foreign currency market, many of which have been successful. Starting in the 1960s with a maximum exchange rate limit, Nigeria's exchange rate instrumentation progressed through several fixed systems between 1970 and 1985, and finally to various versions of the floating exchange rate system beginning with liberalization and the implementation of its structural adjustment program in 1986. (SAP) Since the SAP, Nigeria's most popular floating system has been a regulated floating currency regime that does not guarantee that the rate will remain at a set level. The Dutch Auction System (DAS) was revived on July 22, 2002, after the inability of the flexible exchange rate method changes (the AFEM, approved in 1995, and the IFEM, introduced in 1999) to maintain exchange rate stability. Among the goals of the DAS were to lower the market currency premium, protect declining foreign reserves, and ensure a fair naira exchange rate, all of which have been achieved. Because to the DAS, the naira has stabilized, the widening premium has decreased, foreign reserves have been preserved, and speculating behaviors among licensed traders have been reduced. Since 2003, the foreign currency market has maintained a generally constant level of activity. According to Mordi, (2006), said that, the following factors made it easier for the DAS to be reintroduced in 2002: the

CBN's ability to look at the market, which could keep the CBN from having too much money in the market; lower inflation pressures; the CBN's equipment autonomy and ability to use budgetary control instruments quickly; and bi-weekly auctions instead of fortnightly auctions, which kept the supply of financial products steady. On February 20, 2006, the Central Bank of Nigeria (CBN) set up a new system of wholesale Dutch auctions (WDAS). This new system cut down on official interbank and bureau de change arbitrage premiums, and the prices came together.

As a result, the commercial Dutch Auction System's advantages have been reinforced, while the foreign currency market has grown in order to reach a more realistic naira exchange rate, which has been achieved. Authorized dealers were permitted to trade in foreign exchange on their own funds in order to resell the currency to their consumers under this system of exchange. In a variety of ways, these changes in exchange rates have had an impact on economic performance.

## **1.2 Statement of the problem**

Foreign capital inflows are critical to Nigeria's economic progress because of its status as a developing nation. The purpose of this research is to examine the influence that the exchange rate plays on Nigeria's economic development. Last but not least, the purpose of this research is to look at all aspects of how the Nigerian economy is linked to the country's exchange rate.

Additionally, floods and increased instability might hinder the capacity of farmers to cultivate their land. Further losses of \$35 billion in foreign reserves might lead to significant currency devaluation and inflation. These anxieties have grown as a result of

the successful recovery of the COVID–19 patients. Problems such as high unemployment (27%) and poverty (40%) persist in Nigeria, as well as growing inequality. The exchange rate has been the subject of several empirical research studies that have been published. Nigeria's economic growth and worries about the exchange rate will be better understood after the release of these research findings.

### **1.3 Purpose of the study**

In this age of globalization, the consumption of things from other countries is as prevalent, if not more frequent, than the consumption of products manufactured in one's own nation. Currency values have a huge influence on the amount of money you have to spend on imported goods. Whenever the value of one's own currency falls, the price of imported goods and services increases significantly. A rise in the value of the home currency may result in a decrease in the price of imported goods. Finally, the purpose of this research is to determine how the rate of exchange affects Nigeria's economic growth.

### **1.4. Research Questions**

It is intended that this thesis will seek to address the following broad questions:

1. Is there a relationship between the value of the naira and financial growth in Nigeria?
2. What role does exchange rate play in Nigeria's economy?
3. What is the influence of the exchange rate on the development of the Nigerian economy?
4. How will Nigeria manage to keep the value of the naira under control?

5. What are the factors that influence the appreciation of the Nigerian exchange rate in the economy?

### **1.5. Research Hypothesis**

On the basis of this assumption, the research topic is formulated. The study's goals led to the development of hypotheses that will be tested with the help of advanced econometric tests.

#### **1.5.1. The following is the null hypothesis:**

Exchange rate has no effect on the Nigerian economic growth.

The economic growth or GDP growth has no long-term relationship with exchange rate.

Exchange rate and GDP growth has a positive relationship.

Exchange rate has no short-term impact on GDP growth.

#### **1.5.2. On the other hand, the alternate theory is as follows:**

Exchange rate has an effect on the Nigerian economic growth.

The economic growth or GDP growth has a long-term relationship with exchange rate

Exchange rate and GDP growth has a negative relationship.

Exchange rate has a short-term impact on GDP growth.

### **1.6. Significance of Research**

A currency is devalued when a country's imports surpass its exports, resulting in an imbalanced trade balance (items delivered from that country to a domestic destination).

Since cash is among the most important indicators of a country's financial strength and GDP, currency devaluation may have a huge influence on its inhabitants' everyday lives (GDP). An optimal level of import and export must be maintained in order for a nation to operate effectively. It is possible for a country's import and export activities to affect its GDP, exchange rate, inflation, and interest rates. In this research, the link between the Nigerian naira and GDP growth was examined. This research is being conducted to better understand the link between the exchange market and economic growth. The link between the exchange rate and economic growth was examined using an ARDL regression model. Policymakers will probably look at what they are currently doing when it comes to the connection between growth and currency values.

### **1.7. Objective of the Study:**

The following purposes will be the subject of this investigation:

1. Examine the operation of the exchange rate as well as the development of the Nigerian Gross Domestic Product (GDP).
2. To investigate the link between the Nigerian exchange rate and the country's economic development.
3. Determining the influence of the exchange rate on the growth of the Nigerian economic system.
4. Is to look at ways to keep the Nigerian economy's exchange rate from rising too quickly.

### **1.8. Limitation**

I. The purpose of this research is to examine the relationship between the exchange rate and the development of the Nigerian economy.

The scope of this analysis is limited to the Nigerian economy from 1980 to 2019.

II. The current study's sample size is insufficient to extrapolate the findings to the entire Nigeria population.

### **1.9. Contribution to study**

This thesis will add to the body of knowledge that has previously been produced through previous research on the relationship between the exchange rate and GDP growth in Nigeria.

The concept contributes to current research by examining whether the relationship between the exchange rate and economic growth is a replacement or complementing connection. In prior research, there have been a number of errors, and this paper seeks to address those gaps so that the material is more closely linked with the expected criteria for future research in the country.

The study's contributions are conceptual as well as empirical. Nigeria has a significant global economic presence and benefits from free trade.

This study will aid policymakers and the government in determining the causes of fluctuations of exchange rate and in implementing investment-friendly policies that will attract a large portion of appreciation to the country local currency, thereby contributing

to Nigeria's economic growth expansion. This research can help policymakers focus their efforts on the areas and resources required to create incentives for Nigeria.

#### **1.10 Conceptual contributions include:**

- I. Exact conceptual definitions of exchange rate and GDP growth.
- II. The development of new theoretical connections (i.e., research hypotheses) and the logic that supports them.
- III. Enhancements to the theoretical underpinnings of existing links.

#### **1.11 Empirical contributions:**

- I. This study will try to prove a relationship between the exchange rate and GDP growth that has already been disproved.
- II. Exploring the Impact of exchange rate on economic growth of Nigeria.
- III. determining the extent to which a variable mediates the relationship between exchange rate and GDP growth.
- IV. Examining their significant scale.

#### **1.12. Definition of terms**

**Exchange rate (ER)** The exchange rate is the market value of a country's currency with respect to the currency of another country. When a country uses gold or another agreed-upon measure, the exchange rate is "fixed," meaning that each currency is worth a specified quantity of gold or other benchmark. It is deemed "floating" when the value of an exchange rate is determined by market forces or prediction, rather than by the



government (conversion units). The exchange rate increases when a large quantity of commodities is imported, meaning the exchange rate becomes more expensive for consumers in that country.

**Gross Domestic Product growth (GDP growth)** Growth in the quantity and quality of goods and services produced by a society over a certain period of time is referred to as economic growth. Economic development is a simple concept. It is more difficult to pin down just how big of an increase there has been. Family income or GDP adjusted for inflation are widely used to measure population growth, but this is not the definition. Population health is defined by more than just life expectancy. There are many ways to measure economic inequality, and income measures are only one of them. All of an economy's output may be quantified by its Gross Domestic Product (GDP).

**Foreign direct investment (FDI)** Any investment made into a country by a person or company based in another country is defined as a foreign investment. When a foreign entity acquires ownership or control of a firm in another country, or when a foreign corporation develops enterprises in that country, this is referred to as "foreign direct investment" (FDI).

**Macroeconomics** is the discipline of economics that investigates an economy's overall effectiveness and attitude. It is focused on economic cost estimates such as unemployment, rate of growth, GDP, and inflation.

**Financial derivatives** They are financial contracts with an underlying asset, collection of assets, or benchmark that determines their value. A derivative is a contract that may be exchanged on an exchange or over-the-counter between two or more parties (OTC). These

contracts may be used to trade a wide range of assets, but they also have their own set of hazards. The price of derivatives is governed by the underlying asset's changes. These financial instruments are often used to get access to certain markets and may also be exchanged to reduce risk.

**Foreign securities** cash flows in quantities judged appropriate by the administrator or the Fund to be used to execute foreign trading activities on the Fund's behalf are permitted to be held. The foreign securities of the funds held by each foreign sub-custodian shall be recorded as belonging to the fund on the records of the custodian. As soon as an issuance's credit rating falls below the investment-grade level, the scheme will rebalance its portfolio within five working days. Debt instruments with unique characteristics and derivatives will not be included in the plan. In the United States, nonregistered foreign securities refer to foreign securities that have not been registered with the Securities and Exchange Commission (SEC). Qualified institutional buyers and sellers in the United States are the only parties eligible to trade or buy these assets (QIB). In order to qualify as a Qualified Institutional Buyer (QIB), a financial institution must hold at least \$100 million in non-affiliated securities. Reselling non-registered securities without having to register with the Securities and Exchange Commission is permitted under Rule 144A of the Securities Act of 1933. (SEC). Common stock, preferred stock, and debt instruments (asset-based securities) that are not registered with the Securities and Exchange Commission (SEC) are permitted under Rule 144A.

## **CHAPTER TWO**

### **2.0. LITERATURE REVIEW**

#### **2.1. Introduction**

A survey of the topic's current literature may assist you in learning about past studies on the subject. Before settling on a study subject, it is necessary to perform a thorough evaluation of past studies. Standard books, magazines, journals, published and unpublished research works, and other widely accessible market sources may be used to collect material on the topic of the study. This chapter discusses the exchange rate and GDP growth in considerable depth. Several academic studies on the exchange rate and the literature around it have been conducted. There is a wealth of information accessible about currency rates. A vast number of academics and specialists have offered their time and skills to conduct research on exchange rates. This chapter summarizes the study results based on a large body of literature on exchange rates and related subjects. For the purposes of this chapter, theoretical and empirical work on exchange rates will be explored. The following are some of the most important studies that must be considered in light of the recent investigation.

#### **2.2. Theoretical Framework**

A multitude of ideas are proposed in an attempt to explain the notion of the exchange rate and its link to GDP growth rates.

1. The Purchasing Power Parity Theory, 2. Interest Rate Parity Theory (IRP) and 3. International Fisher Effect.

### **2.3. Theories of exchange rate**

Initialized in 1961, the optimum currency area (OCA) hypothesis is the most prominent theoretical framework for determining optimal exchange rate regimes (1963). The literature in this area is concerned with the stability of commerce and the economic cycle. In addition to shock uniformity, labor market mobility, and degree of openness are taken into consideration. Using a fixed exchange rate system, the argument goes, may help to promote trade and production development by lowering exchange rate uncertainty and, as a result, the cost of hedging, as well as promoting investment by lowering the currency premium over interest rates, among other benefits. It may, however, have the effect of slowing down production and trade growth by halting, delaying, or postponing the critical process of altering relative pricing levels.

Since the transition from a fixed to a floating exchange rate system, the study of exchange rate regimes has evolved in terms of theory. Ideas and principles come in to existence in the course of fixed exchange rates, such as the elasticity approach and the absorption technique, were primarily concerned with the real sector of the economy. In the present era of financial liberalization, the financial sector, on the other hand, is critical in determining how exchange rates will behave. The value of the dollar compared to other major currencies changes because of many different things.

Many theories for determining the rate of exchange between different currencies have been developed on the basis of these factors. Some of the key theories that will be covered in this section/chapter.

**2.3.1. The Purchasing Power Parity Theory** The theory of purchasing power parity describes how to determine the exchange rate across two distinct paper currencies. Cassel's (1918, p. 413). Despite the fact that this notion may be directly traced to Wheatley and Ricardo, the Swedish economist Gustav Cassel was the first to articulate it methodically. PPP is a theory of exchange rate regimes because it states that nominal exchange rates, in general, move in the right direction to equalize the relative price levels between two nations. The PPP hypothesis holds that price movements are dominated by monetary factors in the sense that the money supply increases in proportion to the price level, even when the underlying mechanism required to achieve a certain common level of prices is not always explicitly specified (Dornbusch, 1988; Froot and Rogoff, 1994; Rogoff et al., 2001). According to the PPP hypothesis's underpinning trade theory, exports and imports are equalized over time by the same process that ensures that prices in two nations that trade with one another will be equal. Hume's price-specie-flow mechanism (Antonopoulos, 1997; Ruiz-Nápoles, 1996; Shaikh, 1980) is a well-known example of this idea. The level of prices fluctuates because of changes in the quantity of money in circulation, which varies with the trade balance (RuizNápoles, 2004). According to standard trade theories (such as Ricardo's theory of commerce), trade between two commodities and two nations can only take place in terms of money prices in two commodities, two countries model. As a result, if one nation had an absolute edge in manufacturing both commodities (due to greater productivity and superior technology), it would be compensated financially via its exports. The quantity theory of money says that as long as money is coming in, the price will rise until one of the two absolute advantages is lost. Both countries' prices fall as a result of the outflow of money in the less efficient nation, making the item more

appealing for importation from outside. What we are seeing here is an attempt to convert absolute advantages into relative ones through the money flow (Shaikh, 1980).

According to this theory, the equilibrium rate of exchange is defined by the purchasing power equivalency of two demonetized paper currencies. Is it possible that the prices in each country are what determines the exchange rate between two non-convertible paper currencies?

In the buying power hypothesis, there are two parts: (I) The Absolute Version, and (ii) the Relative Version.

**(I.) The Absolute Version:** Using the purchasing power parity premise, the exchange rate should normally show the relationship between national currency units' inward purchasing power. To put it another way, the exchange rate is the difference between the price of a certain set of commodities in one nation and the price of the same set of items in another country. An example might be given to illustrate this point.

In Nigeria, you may purchase 10 units of commodity X, 12 units of commodity Y, and 15 units of commodity Z for Naira 10,405 each. However, in the United States, you can get the same amount of X, Y, and Z for \$25. As a result, \$25 is comparable to Naira 10,405 in each of their home nations. This may be used to figure out how much the naira is worth in US dollars.

Although the absolute form of the buying power parity theory is unquestionably straightforward and elegant, it is not without problems. For starters, this approach to determining exchange rates is unsuccessful since it seeks to evaluate the absolute worth

of money (or buying power). Purchasing power is, in reality, assessed in terms of relative worth. Second, the types and quality of items available in the two nations vary.

These inequalities are a significant impediment to the internationalization of product pricing and must be addressed immediately. Three factors, in addition to variations in quality and kind of goods, influence demand patterns and transportation costs. These factors include tariff systems, tax policies, the extent of governmental meddling and regulation, and a variety of other variables. In light of these inconsistencies, it is impossible to determine the exchange rate between two or more currencies in absolute terms with any degree of precision.

**(II) The Relative Form** Purchase power parity (PPP) is a hypothesis created by Cassel to explain variations in the equilibrium rate of exchange between two currencies represented in their relative form. A linkage between variations in currency purchasing power parities and exchange rate fluctuations is established. Exchange rates for two countries may be influenced significantly by changes in the relative values of their currencies over time, which is another way to put it. Exchange rates are determined by their relationship to price indices in the current and base periods as well as to the ratio of price indices in the present and foundation periods of the two countries involved.

### **2.3.2. Interest Rate Parity Theory (IRP)**

According to Interest Rate Parity (IRP), the difference between interest rates in two different nations is equivalent to the change between future and market exchange rates in the two countries' respective currencies. Interest rate parity refers to the link that exists between interest rates, spot rates, and foreign currency exchange rates. It has a huge impact

on the foreign exchange markets. If you are interested in studying the link between an exchange rate's spot rate and its relevant future rate, the IRP assumption may be applied. According to this hypothesis, interest rate distinctions between two distinct currencies would never be distributed unequally, and the discrepancy would be recognized in the markdown or high price of the forward exchange rate of the foreign currency in which the differential exists. According to this idea, the magnitude of an international currency's substantial discount is equivalent to the change between the actual and potential interest rates of the two nations involved in the transaction.

**2.3.3. International Fisher Effect** People who study economics say that the International Fisher Effect (IFE) usually holds true. It is a theory that says that when the interest rates of two currencies change, the difference in their exchange rates usually changes as well.

People who study the International Fisher Effect (IFE) say that differences in nominal interest rates across countries may predict changes in the value of the currencies in those countries.

The IFE claims that countries with higher nominal interest rates also have higher inflation rates, resulting in currency depreciation against other currencies.

Evidence for the IFE is varied in practice, and direct estimate of currency exchange movements from projected inflation has grown increasingly popular in recent years.

### **The International Fisher Effect: An Overview (IFE)**

The IFE is a tool for forecasting currency fluctuations that looks at present and future lending rates on risky assets such as Treasury bonds. Instead of using just inflation rates



to anticipate exchange rate fluctuations, this technique uses a hybrid approach that ties both increasing inflation rates to the appreciation or depreciation of a currency's value. When it comes to understanding a currency's strength in the global market, it is important to understand how interest rates are affected by other financial factors such as interest rate policy modifications. According to the International Federation of Exchanges (IFE), countries with lower interest rates also experience slower growth. This may lead to increases in the actual worth of an associated currency in comparison to other nations. As a result, currencies from countries with rising interest rates would fall in the short term.

Irving Fisher, an American economist, is the name given to this hypothesis.

Irving Fisher was a superb mathematical economist and one of the most intelligible economics authors of all time in the United States. He had the foresight to include mathematics in practically all of his ideas, but only after he had properly stated the key concepts in language. And he was quite clear in his explanations. Graduate economics students can read (and understand) half of Fisher's Theory of Interest in one sitting, which is unparalleled in technical economics.

#### **2.4. The significance of the exchange rate**

The exchange rate is important for several reasons:

- a. This market connects a broad variety of products, services, and investment securities on the local and international levels, and it is the principal connection between them. With the help of the exchange rate, we can figure out how much it will cost to purchase anything in another country's currency.

b. Currency fluctuations may have an influence on both current inflation and inflation predictions in the foreseeable future. A significant influence on the domestic pricing of imported products and services is exerted by fluctuations in the value of the dollar. A stronger peso lowers the peso price of imported goods and services that depend on imports, like transportation, which lowers the rate of inflation in the short term.

c. Changes in exchange rates may have an influence on the country's external sector by altering overseas commerce. There could be a drop in our export prices if the value of the peso, for example, went up. This may make our exports less competitive in comparison to those from nations whose currencies have appreciated in value.

d. The cost of financing the country's foreign debt is influenced by the currency rate (principal and interest payments). A stronger peso decreases the number of pesos needed to buy foreign currency to pay interest and mature debts. Economic elements or variables that influence exchange rates, and they may fluctuate for a diversity of reasons, including supply and demand. Exchange rates may fluctuate for a variety of reasons, including:

**Lending Rates and Term Structures-**Currencies and exchange rates are affected by changes in interest rates. All else being equal, an increase in a country's domestic interest rates will lead to a rise in demand for the local currency as more overseas investors want to make investments at the higher rate. The growing cost of goods compensates for this, however, in reality.

**Inflationary Rates-**The value and exchange rates of currencies are affected by inflationary forces. Since the value of the local currency depreciates significantly more

quickly than the values of other foreign currencies over time, a higher inflation rate in a local nation decreases demand for the local currency.

**National Deficit-**The term "government debt" refers to the total amount owed by the federal government. Having greater debt makes it more difficult for a country to attract foreign investment, which raises inflationary pressures on the value of its currency. As a result, the value of the local currency drops, as does the exchange rate.

**Stability on the political front-**Because a nation that is politically unstable is less likely to attract foreign investment, the value of its currencies, as well as the pace at which they fluctuate, are affected as a result. When there is political upheaval, investors are more at risk because they do not know if their investments will be safeguarded by fair market procedures or a robust legal system, which makes them more vulnerable.

**Activities in Export and Import-** The value of a nation's currency exchange rates is influenced by the amount of net trade balance that the country has. When a home country exports more goods than it purchases, the value of its currency grows, and the value of its currency relative to other international currencies increases as a result.

**Depression-Recession** impedes foreign investment because of the decreased attractiveness of a country. Investing in an economy with a poor outlook entails more risk, which is one reason for this. When interest rates are low, foreign investors are less likely to buy local currency.

**Speculation**-For whatever reason, investors purchase more of a country's currency in anticipation of it appreciating. It might encourage individuals to hold on to their own currency rather than rely on foreign currency at first.

**Particular Considerations**-There are many more factors that must be taken into account when calculating the exchange rate. Certain "safe-haven" currencies, for example, are viewed as stable and attract foreign money when the future of the global economy is uncertain. An example of a currency is the US dollar, which may be exchanged for other currencies such as the euro or the Japanese currency. Another thing that makes the US dollar unique is that it is the world's federal reserve currency, which makes the US dollar more valuable than other currencies.

Because of globalization, the current global economic system is extremely globalized. The significance of the exchange rate cannot be overstated. The significance of the exchange rate is derived from the participants and characteristics of the market (Kallianiotis, 2013). It is also relevant since it is a variable in both macroeconomic policy and company operations, which makes it an important factor to consider when making financial decisions (Moosa, 2000). As an instrument for economic policy, Pilbeam points to the exchange rate as an example (1991). It is impossible to exaggerate the significance of exchange rates on the economy of a country. The country's competitiveness is intended to be increased via the use of exchange rate management as a strategic economic tool. Economic development may be facilitated by a stable, competitive, and properly flexible exchange rate, according to Guzman (2017).

Because global financial markets are volatile, flexible and long-term measures are essential. As a result, they say that all of these interventions must be used in conjunction with a wide range of other economic measures.

## **2.5. Introduction to GDP growth**

GDP may be reported in a number of ways, each of which yields somewhat different information.

**GDP in nominal terms**-The nominal GDP of a nation is the total of the country's economic production adjusted for current prices. This means that inflation and the pace at which prices increase are not taken into consideration, which may result in an overestimation of growth. The prices at which all of the goods and services that were included in nominal GDP were purchased that year are used to determine their value in that year. To compare GDPs on a strictly monetary basis, nominal GDP is calculated in either domestic currency or US dollars at current market exchange rates. It is necessary to compare nominal GDP when comparing various quarters of production within the same year. When comparing GDP over a period of two or more years, real GDP is used. Since inflation has been taken out of the equation, it is only possible to make comparisons between years because of how much things have changed.

**GDP in real terms**-An economy's real GDP is an evaluation of its stock prices in a given year, with asset values-maintained year after year in order to isolate the effects of inflation or an economic downturn on the consistent pattern in output. GDP (gross domestic product) is a statistic for the year's contract between the industry and the government, with price levels held steady year after year to separate the effect of inflationary pressures from

the continuing trend in output. Due to the fact that it is dependent on the monetary value of goods and services, economic output (GDP) is susceptible to inflation. While price increases help with a country's GDP development, they may not always result in an increase in the quantity of items and services offered or an improvement in the quality of those products and services. As a result, merely looking at a nation's nominal GDP might make it hard to determine if the economy has grown as a result of genuine advancements in production or simply as a result of price rises in that country. Real GDP is calculated by economists after adjusting for inflation. Economics may be used to allow for the impacts of inflation by adjusting the production of each year through the price level of the previous year, called a base year. The Gross Domestic Product (GDP) of a nation may be compared year after year to determine whether it is expanding or declining. For real GDP to be computed, the GDP price measure of inflation, which is the price difference between both the present year and the foundation year, has to be adjusted for inflation. Price increases of 5% or more since the reference year result in a deflator of 1.05 or greater; otherwise, the price index is 1. Using this deflator, you can determine real GDP by dividing nominal GDP by the number of zeros in the deflator. The fact that inflation is often positive means that nominal GDP is greater than actual GDP. Due to the fact that real GDP accounts for changes in economic value over time, the discrepancy between year-to-year output levels is becoming narrower. If the real GDP of a country is very different from the nominal GDP, it is possible for the country to have very high inflation or very low inflation.

**Per capita GDP**-In a nation, the GDP per capita is a computation of the GDP per individual depending on the population of the country. It demonstrates how the quantity

of production or revenue generated by each individual in an economy may be used to estimate productivity levels or living standards in a society. This is one of three ways to figure out how much each person makes in nominal GDP per capita: nominal GDP per capita, real GDP per capita, and purchasing power parity GDP per capita (PPP).

In its most basic form, per-capita GDP indicates how much economic output value can be attributed to each individual person in terms of money or goods. Because GDP selling price by person is a simple way to measure wealth, it also gives an idea of how much money the country has overall. Per-capita GDP is frequently used in conjunction with other, more standard measurements of GDP. Economists use this indicator to get insight into the internal productivity of their own nation and the production of other countries in the world. The per-capita GDP of a nation takes into consideration both the country's GDP and its population. As a result, knowing how each part affects the total outcome and GDP growth for each person is important.

A nation's per-capita GDP increases while its population stays unchanged. This could be due to technical breakthroughs that enable so much to be created with the same number of people in the country. Others have a smaller population but a higher GDP per capita since they have developed a self-sufficient economy that produces a wide range of goods and services for their people.

**GDP Growth in a Nutshell-**The GDP growth rate measures the pace at which a country's economic production increases from year to year (or from quarter to quarter) in order to estimate how rapidly the economy is expanding. It is a popular metric among policymakers since GDP growth is seen to be directly connected to major objectives such

as inflation and unemployment rates. One of the most common ways to represent it is in terms of a percentage rate. As a result of faster GDP growth rates, the central bank may indeed be compelled to increase interest rates as a result of concerns that the market is "overheating." If GDP growth slows down or even goes down, central banks think that interest rates should be lowered and that more stimulus may be needed.

**GDP ((Purchasing Power Parity)**-Economic analysts employ purchasing power parity (PPP) to calculate a country's gross domestic product (GDP) in "international dollars." These comparisons are made possible by taking into account differences in prices and living costs in different countries when comparing real production, economic output, and living standards across countries.

## **2.6. Empirical Literature**

Experiments show that the exchange rate has a big impact on how much work and how much money people get paid. Depreciation has been shown to have a contractionary effect on output in previous studies. To this extent, many mechanisms for contractionary devaluation have been discovered.

Argentine economist Diaz-Alejandro (1965) investigated the impact of devaluation on a variety of macroeconomic indicators over the period 1955 to 1961. He pointed out that devaluation is harmful to the economy for Argentina because it promotes a shift in wealth disparity in favor of savers, resulting in a decrease in consumption and real GDP growth. He also noticed that the current balance was improving since the quantity of funds coming in was much less than the amount of cash leaving.



Between 1959 and 1966, Cooper (1971) analyzed twenty-four episodes of devaluation, including nineteen different emerging countries. According to the study, devaluation boosted the devaluing nation's trade balance, but it also resulted in a drop-in economic activity and an increase in prices in the short term, according to the study.

The monetary model and a well-known mixture of PPP and monetary theory predict that monetary inventions are the source of transitory departures from PPP because nominal limitations inhibit the rapid adjustment of prices and wages in the goods market (Dornbusch, 1976). During periods of high inflation, price changes have a tendency to get in the path of other factors, which might lead the actual exchange rate to move in the opposite direction of the purchasing power parity (Zhou, 1997). Thus, the real exchange rate cannot vary at random, as would be expected.

Gylfson and Schmidt (1983) conducted a similar study in which they created a log-linear micromodel of a market economy for a sample of ten countries, using variable estimates of the model's basic parameters to do so. According to the researchers' findings, depreciation had an expansionary effect in eight of the ten countries studied. In two countries, it was found that devaluation was contractionary (the United Kingdom and Brazil). The most crucial aspect of the prior study was that they conducted simulations in order to determine what would happen in the real world.

Within the second line of study, researchers attempted to determine how they could better predict and evaluate whether actual exchange rates would change as a result of effects on the real market (Neary, 1988). Changes in trade terms have also been proven to have a considerable effect on actual exchange rate behavior (Edwards, 1994; Ostry, 1988).

Only a few regression-based research on contractionary devaluation have been conducted (1992). Three examples are (Edwards et.al.,1989a, b.Agenor et.al., 1991a, and Morley et.al., 1992). Edwards (1989) used a cross-country sample of time series and cross-country time series to regress real GDP on nominal and real exchange rates, government expenditure, terms of trade, and money growth indices. He discovered that devaluation lowered production while other parameters remained constant in the near run. Even while the contractionary impact persisted, his opinions on the long-term consequences of a true devaluation were more ambiguous.

With the use of a regression model, Morley (1992) investigated the impact of real exchange rates on output in twenty-eight developing countries whose currencies had fallen over the previous year. According to his findings, devaluation at the stage of the real effective exchange rate lowered production after accounting for factors that might both increase and reduce output, such as trade terms, import growth, changes in the supply of money, and the fiscal balance, among others.

To explain why Kenyan inflation continues to rise and fall, Ndung'u (1993) developed a six-variable VAR that included the following variables: money supply, domestic price level, exchange rate index, foreign price index, actual output, and interest rate). He realized that both the inflation rate and the exchange rate were self-explanatory figures.

The differences between these models are based on the elements that are believed to impact the behavior of the actual exchange rate. A lot of people looked at productivity differential models, like Balasa, Obstfeld, and Johnston (1993), and Chinn and Johnston

(1996). They also looked at how real interest rate differences and demand shocks affected the labour market.

As previously stated, Agénor (1995) examined 23 developing nations and correlated production growth with changes in the market exchange rate, public expenditure, and money supply. He also looked at how the real spot price, public spending, and money supply didn't match up with what he thought would happen. He found that these discrepancies were important.

According to the statistics, unanticipated real exchange rate depreciation enhanced production growth, whereas unexpected real exchange rate depreciation had a contractionary impact.

Using a six-variable VAR, Rodriguez and Diaz (1995) studied Peruvian production swings based on the following variables: increase in output, real wage growth, depreciation of the currency rate, inflation, financial expansion, and the Solow residuals. While they observed that currency depreciation had a negative influence on production, they concluded that self-shocks accounted for the bulk of the rise in output. Rogers and Wang (1995) observed results that were similar to those in Mexico. In a five-variable VAR model, the bulk of the changes in Mexican output were caused by their own shocks, which included changes in output, government expenditure, inflation, the real effective exchange rate, and the rise in money supply and demand. But they were able to demonstrate that currency depreciation resulted in a decrease in production. Copelman and Wermer (1996) observed that positive shocks to the rate of depreciation of the exchange rate had a substantial negative impact on loan availability and a negative effect on output. They used

the same technique but slightly different variables to arrive at their findings. In contrast to expectations, shocks to real exchange rates had minimal impact on output, indicating that the contractionary consequences of devaluation are more closely linked to the pace of change in nominal exchange rates than changes in real exchange rates. In fact, they found that their own credit shocks had no effect on production, which shows that devaluation had an effect on production that was not just caused by a lack of money.

In 1998, Kamin and Klau developed a regression equation relating production to the real effective exchange rate for a collection of twenty-seven countries, using an error-correcting strategy. According to the analysts, the devaluation had little long-term inflationary impact on the economy. Furthermore, even though reverse causality seemed to counteract the contractionary effects of depreciation in the short term by removing the sources of the false correlation, the effect stayed even after the controls were removed.

The results of the VAR model are useful in addition to simulation and regression analysis, but they are not mainly concerned with the impacts of the exchange rate on production.

In their research, Odusola and Akinlo (2001) examined the link between the rate of exchange, inflation, and production in Nigeria. It was decided to use a dynamic VAR model to illustrate the interaction between the rate of exchange and output. In the case of the parallel exchange rate, the data from the concurrent model revealed that it had only a quick contractionary effect on production. Prices, the secondary real exchange, and the loan rate have all been cited as important factors in the fluctuation of the official exchange rate in recent years. In addition, the parallel rates of exchange and production had an impact on the trajectory of inflation in Nigeria. The authors ended by urging the central

bank to concentrate its efforts on managing alternative exchange rate movements and enacting monetary policies that support income growth as opposed to other objectives. The majority of the outcomes were positive.

Both Batini et al. (2004) and Mordi et al. (2006) address comparable themes in Nigeria, although they do so in a somewhat different method than their counterparts. An alternative approach is used by Aliyu, who in 2009 discovered that prices in Nigeria react less proportionally to exchange rate shocks than in other parts of the world.

Hyder and Mahbood (2006) studied Pakistan's stable real effective exchange rate discrepancy, utilising yearly data from 1978 to 2005. They evaluated an ECM using an OLS estimation method and the Engle Granger co-integrating methodology.

This included openness; terms of trade; real investment to GDP; government consumption; workers' remittances; long-term capital to GDP; and the total factor productivity difference. The independent factors in their model were: real effective exchange rate depreciation was produced by increased openness, increased government spending, and capital inflows, whereas a rise in real investment to real GDP and an expansion in the total factor productivity gap drove real effective exchange rate appreciation. Variables such as inflation, interest rates, and the supply of money all influence the fluctuation of real exchange rates. Production, inflation, an economy's flexibility, interest rates, domestic and global supply of money, the exchange rate structure, and central bank autonomy are just a few of the factors that influence an economy's performance (Stancik, 2007). When it comes to the degree of effect each of these factors has, the quantity fluctuates depending on a country's economic standing.

So, countries that are going through changes (like Nigeria) are more at risk from these factors, which have an impact on how the central bank makes monetary policy decisions.

According to Mireille (2007), the currency appreciation exchange rate has been a major impediment in the recovery efforts of Nigeria and the Benin Republic, among other countries. When the prices of items for sale in the local region rise, depreciation may also be economically beneficial and maintain the equilibrium of the exchange rate, provided it is used in conjunction with well-targeted policies.

Aliyu et al. (2009) analyzed Nigerian currency rate changes between 1986 and 2007. When developing the estimating approach, it was decided to use a quarterly series, and a vectors error correction estimation. They discovered that exchange rate was low in Nigeria during the study period and decreased throughout the value chain, which partly contradicts the conventional wisdom in the literature that exchange rate swing has always been substantially higher in compared to developing countries. The authors predict that pass through will increase in the long term. They argue that monetary policy should be altered to account for this.

According to Juthathip (2009), five important long-term factors control the real exchange rate in developing Asia. Things to examine include productivity gaps, openness, trade conditions, net foreign bank accounts, and government expenditure, amongst other factors. Additional factors, such as the annual deficit, may be included in the calculation in particular countries if these variables have an influence on the real exchange rate. If you think that real exchange rates in less developed countries are more vulnerable to real shocks than real exchange rates in more developed countries, then you can say that

country-specific features can make a difference in how much each shock affects real exchange rates. Consensus: fundamentals may explain at least part of the behavior of real exchange rates over medium-to-long time horizons.

Ricci, Ferretti, and Lee are three of the world's most well-known designers (2008). The Fundamental Equilibrium Exchange Rate (FEER) theory is one of the most often utilized theories in establishing the equilibrium real exchange rate in a free market (FEER). FEER is described as the exchange rate at which domestic and foreign balances are attained. FEER is also known as the real exchange rate. Internal balance is attained when the economy has reached full capacity and inflation is at a low level. When there is an adequate net resource flow and the capacity to service external debt over the medium term, there is a stable balance of payments position. When it comes to the short-term cyclical and speculative consequences of the foreign exchange market, the FEER prefers to keep away from them. From a fixed exchange rate system in the 1960s to a floating system in the 1970s and 1980s, and then to many different types of floating exchange rates that were set up in 1986 as part of the Economic Reform Program, Nigeria's currency rate system has changed a lot.

In Nigeria, the effects of interest rates on savings and investment were explored by Acha et al. (2011). Data from the Nigerian Central Bank was utilized in this investigation (CBN). Pearson's correlation coefficient and the ordinary least square (OLS) method were used to examine the data. The authors concluded that interest rates are not a reliable indicator of savings and investment, which suggests that bank loans are used for non-productive reasons. In order for interest to help the Nigerian economy, the research said that bank loans should go to projects that were going to make money.

In research by Udoka et al. (2012), two research hypotheses are developed in order to analyse both interest rate fluctuation and economic growth and the distinction in economic growth before and after the interest rate deregulation regime in Nigeria. A statistical report from Nigeria's Central Bank supplied the necessary data for our investigation. OLS was utilised to analyse and analyse the data collected. According to the statistics, the interest rate and Nigeria's economic growth are directly linked. If Nigeria's GDP growth was slowed by a rise in interest rates, it would take longer for the real sector to grow.

According to Umeora (2013), the impact of increasing foreign reserves on Nigeria's currency rate and inflation was studied in detail. In order to come to his conclusions, he relied on CBN statistics reports. To figure out the effect of accumulating foreign reserves on inflation and exchange rates, he used a simple linear regression model. Nigeria's external reserve accumulation was shown to be negatively correlated with the exchange rate; nevertheless, inflation was found to be positively correlated with Nigeria's external reserve accumulation. He said inflation in Nigeria was caused in part by the country's money supply. He suggested that the government use and take care of the country's foreign reserves as much as possible. This study examined the effect of Nigeria's economic growth on the naira's real exchange rate mismatch by Ali, Omotosho, Ajibola, & Adele (2015). They made use of information gleaned from surveys carried out every three years between 2000 and 2014. In order to determine the real exchange rate's departure from a sustainable equilibrium route, the real effective exchange rate's departure from a sustainable optimum point was calculated using the cognitive equilibrium exchange rate approach. According to the conclusions of the research, Nigeria's economic growth has been negatively impacted by the actual misalignment of the currency rate. The use of a commercial



exchange rate system forever was one of their proposals to ensure that the exchange rate of the Naira stays on a stable track in the future.

Researchers Adelowokan, Adesoye, & Balogun looked at the impact of exchange rate fluctuations on Nigerian economic progress from 1986 to 2014, and their findings were published in 2015. They carried out their research using the ADF stationarity test and the error correction technique. Some of the things that are looked at are the Gross Domestic Product (GDP), investments, exchange rates, interest rates, and inflation. An association between currency depreciation and investment and economic growth was discovered in the research. An association was also discovered involving inflation, interest rates, as well as the real exchange. Their recommendation was that Nigeria create a robust exchange rate system in order to promote the country's economic development. Both the connection between economic growth and changes in currency rates, as well as the connection between inflation and economic growth, were examined by Amassoma & Odeniyi (2016) in Nigeria. The researchers used the Johansen analysis of cointegration and the error correction technique to investigate this link. In both the short and long term, there was a positive correlation between changes in the exchange rate and economic growth in Nigeria.

Nigeria's foreign currency reserves and economic growth from 1981 to 2014 were studied by Nwosa (2017) in a research project. GDP was the dependent variable in this research, whereas factors such as GDP, labour force, and foreign currency reserves were independent variables. Time series and an OLS regression technique he devised on his own were both used in this investigation. According to his study, there is a positive and statistically significant correlation between foreign currency reserves and economic

growth. He said Nigeria's foreign reserves should be properly managed so that the economy may expand more quickly, he said. He also said that strategies to increase the country's foreign reserves should be looked into and put into place. Payment for products and services in international commerce is frequently conducted in multiple currencies, according to Richard (2018). Because of this, a conversion basis must be agreed upon by the seller and buyer. The exchange rate for the currencies concerned is known as this. The process used to convert one currency into another is known as an exchange rate. The robustness of the nation's economy is reflected in this rate. The objective of any exchange rate is to find the best possible exchange rate while simultaneously ensuring that it remains stable. As a result of these efforts, the foreign financial market has become more efficient in the last several decades.

Richard (2018) examined how the naira's exchange rate influenced Nigeria's economy from 1986 to 2018. His major objective was to figure out how the Nigerian economy and the foreign exchange rate interacted. He was successful. This relationship was discovered using a theoretical framework. According to him, interest rates, external reserves, oil production, foreign direct investment, the oil price index, inflation rates, terms of trade, emigration remittances, the price index, and foreign public loans all have a direct impact on Nigeria's currency rate. His results show that Nigeria's macroeconomic indices and the foreign currency rate are linked. He urged the central bank to keep the foreign exchange rate constant. The fiscal and monetary authorities should always keep an eye on other macroeconomic indicators that have a positive relationship with the exchange rate. This will stop foreign reserves from leaking away. The Nigerian foreign currency market was studied by Akindele (2018) from 1985 to 2016. Two equations were used to examine

secondary time series data, and the OLS approach was used to estimate it. According to his findings, the Nigerian exchange rate has a large and positive link with GDP, oil prices, interest rates, and inflation rates, but the broad money supply has a negative association. He decided that the Nigerian foreign exchange rate market wasn't working well and that the country's monetary regulators should make it easier to see how exchange rates are set to reduce the risk of currency rate volatility.

Lee and Kim (2020) discovered that a negative shock in foreign reserves leads the Korean won to appreciate while simultaneously decreasing fluctuation and capital inflows via an empirical evaluation of VAR models using monthly data. Most econometric analyses revealed that exchange rates (either rises in the value of the real effective exchange rate or changes in the speed of depreciation) were linked to lower output and higher inflation. All of the studies mentioned above agreed that the countries under study were experiencing contractionary devaluation. But in Latin America and other developed countries, contractionary devaluations dominate. There have only been a few studies in Sub-Saharan Africa, particularly in Nigeria, and this has sparked more investigation.

## **CHAPTER THREE**

### **3.0. Data and Methodology**

#### **3.1. Introduction**

The numerous approaches, procedures, or tactics employed to get the necessary information for the study are addressed in depth in this part of the research. This section also examines and discusses the various statistical procedures that were utilized to evaluate the data gathered during the investigation.

#### **3.2. Sources and data types**

In order to arrive at their ultimate conclusions, most research projects rely on two forms of data: theoretical knowledge and data analysis, which is often employed to obtain those conclusions. The writer of this study followed the same route as the author of the prior study. To get quantitative data for a variety of components and variables, the World Bank Data Center must be used as a resource. Beginning in 1980 and concluding in 2019, the project will collect data on an annual basis for a total of 40 years, beginning in 1980 and finishing in 2019. Economic variables like Real effective exchange rates and GDP growth should be looked at over a long period of time in order to be more reliable and accurate.

#### **3.3. The assessment of variables**

The data for either the dependent and independent variables in this research is gathered from the World Development Indicators database, that is accessible online. Most variables were set forth in a format that is be used to achieve the thesis objectives, and only a very

small number were submitted in formats that could not be utilized to achieve the study's objectives.

We looked at the GDP growth as a dependent variable while also looking at exchange rate, interest rates, inflation, and broad money to assess how the economy was performing.

The following factors were investigated:

**GDP growth (GDP)** - It is necessary to assess the amount by which a nation's economic output has changed over the years in order to estimate how quickly the country is growing. This has resulted in economic officials routinely referring to this indicator, which is generally expressed as a total percentage. If the pace of GDP growth accelerates, the central bank may consider boosting interest rates as a sign that the economy is "overheating," according to the Federal Reserve. However, central banks see a slower (or negative) rate of GDP growth (i.e., a recession) as signaling that interest rates should be reduced and further stimulus measures may be necessary.

**Exchange Rate** is represented by **Real Effective Exchange Rate (REER)** Exchange rates show how much one currency is worth with respect to another. Depending on the situation, they might be expressed as an average rate over a given time period or as an end-of-period rate. According to the International Monetary Fund (IMF), exchange rates may be divided into three broad categories: (1) market rates, which are determined by the market; (2) official rates, which are set by the government; and (3) currency rates. A conversion rate is used to show how much a certain currency is worth in terms of the U.S. dollar. Because Nigeria is one of the most populous countries on the planet, we wanted to examine how exchange rate's function there. As a result, we selected the actual exchange

rate, which indicates how much domestic products and services are worth in foreign currency.

**Inflation (IN)** - It is one of the most commonly used terms in the field of economics. Countries have been in a state of limbo for extended periods of time as a result of inflation. For central bankers, the phrase "inflation hawk" is widely used to characterize their behavior. After winning elections on the promise of keeping inflation under control, politicians have found themselves in power only to lose it when they fail to deliver on their promises. During his first term as president, Gerald Ford proclaimed inflation to be the nation's most serious public problem. So, what exactly is inflation, and why is it such a big deal in today's world?

Over time, inflation may be measured as the rate at which prices increase as a function of time. Inflation is frequently defined as a broad indication, such as the overall rise in prices or the growth in the cost of living in a nation. It may, nevertheless, be more precisely determined for certain things, such as food, or for specific services, such as haircuts. The term "inflation" refers to a rise in the prices for a certain set of goods and services over a certain amount of time, usually a year, in any environment.

**Real Interest Rate (RIR)** - The cost of borrowing money is compared against the price of saving money, and the result is the interest rate. If you are a consumer, the interest rate is the price you pay to the lender in exchange for taking out loans, represented as a percentage of the loan amount. If you borrow a particular amount of money and get a percentage of it, the sum you must return is bigger. If you put money aside, the savings rate tells you how much cash will be transferred into your bank account as a percentage

of the amount you have saved. More cash will be put into your bank for a particular deposit size if the savings rate is higher than the current rate. We opted for the real interest rate since it accounts for inflation. A bond or a loan's actual interest rate is calculated by taking inflation into account. Simply put, this rate tells investors how much they can expect to earn when inflation is taken into account. When the real rate of inflation is either unknown or predicted, this sort of rate is termed predicative.

Even small adjustments in interest rates have the potential to have a substantial impact. It is vital to keep an eye on whether they are increasing, decreasing, or staying the same size.

**Broad Money-** The volume of money flowing in an economy is referred to as "broad money." It is the most comprehensive method of determining how much money a nation has since it includes both cash and other assets that may be converted into currency to purchase goods and services. Economists have a significant issue in measuring how much money is flowing through the economy since cash may be traded for a broad variety of financial goods. The money supply may be calculated in many ways. To identify the measurement, they are using in a specific example, economists employ the capital letter "M" followed by a number.

The formula for estimating the money supply differs from one nation to the next. The largest measure of money is "broad money," which includes certificates of deposit, currencies, money market accounts, Treasury notes, and anything else that may be converted into cash (but not corporate shares).

Increasing the total quantity of money in circulation provides a number of advantages. Above all, it helps policymakers recognize potential inflationary tendencies. When determining monetary policy, central banks often examine both broad and narrow money.

Economists have demonstrated that the money supply, inflation, and interest rates all have significant relationships. Lower interest rates are used by central banks, like the Federal Reserve, to make more money available in order to help the economy grow and make more money available to people.

A rise in interest rates happens when there is less money in circulation. This means that prices will be less expensive.

Simply put, when more money is available, the economy expands more quickly because firms have greater access to capital.

The economy slows and prices decrease or stay steady when there is less money in circulation. Broad money is one of the indicators that central bankers consider when deciding what, if any, steps to take to influence the economy.

Money supply and economic growth seem to have a substantial correlation in similar research (Sims 1972; and Heber 1991, 1996) Other examples are (King and Levine 1993b; Wachtel and Rousseau 1995; Neusser and Kinglert 1996).

Others are Acemoglu and Ziliboti (1997), and Mansor (2005),).

Despite this, the impact of money supply on Nigeria's economic growth should only be taken with a grain of salt. Despite this, a number of studies have shown that money supply and economic growth are intertwined.

### **Stationary**



Stationary series are those in which changes in the length of time since the series began have no influence on the series' mean or autocorrelation (Gujarati and Porter, 2009). This maybe infer that series under inquiry is non-stationary if the dataset under consideration is likewise non-stationary, When the mean of a series, its correlation, its variance, and other features of the series don't really vary over time, the series is said to be stationary.

Alternatively, it is possible that the series is alson't influenced by the passage of time at all.

Regardless of whether or not the fix is carried out, the series will continue to be non-stationary.

Non-stationary, unit root, and other similar concepts are used interchangeably at times. It is well understood that in order to make predictions about a time series, it must be stationary. This is true throughout the whole series. In this thesis, the stationarity of the variables was established using the Augmented Dickey-Fuller and Philips-Perron tests. Both of these tests have been improved over prior versions. As a starting point for statistical analysis, a 5% significance criterion is recommended. In the setting of a random stroll, the equation below yields as non-stationary series:

$$Y_t = Y_{t-1} + \epsilon_t.$$

Notably, the Epsilon version epsilon is a stationary random disturbance term in this circumstance. As seen by the above equation, the anticipated value of the dataset y is constant across time. It is clear from the above equation that the range of the dataset y grows as time progresses. Because the concept of drift is a difference between the two

stationary series, the original difference of  $y$  is also a difference between the two stationary series.

$$Y_t - Y_{t-1} = (1 - L) Y_t = \epsilon_t.$$

As soon as it becomes integrated, the difference stationary series is expressed by the symbol  $I(d)$ ; the symbol  $I(d)$  denotes that integration of the difference data set has taken place at the stated point in time. Specifically, the coefficient of determination affects the total number of unit roots that can be accepted in a series, as well as the number of distinguishing procedures that must be carried out to bring the series back into balance. This series is known as the "I(1) series" because each unit root in the random walk mentioned above is a single unit root in the series. We may deduce that a series is stationary when it is stationary at  $I(0)$ , which means the series was stationary at level, but if it is  $I(1)$ , then it is stationary at first difference.

As long as you're working with regressions that have a combined dependent variable or combined repressors, you don't need to use standard inference procedures.

These are classified as follows: As a consequence, it is critical to determine if a series is stationary before using it in a regression to guarantee correct findings. The unit root test is the most often used technique for determining whether or not a series is stationary. Can you explain a stationary dataset assists us? Whereas if standard deviations of the data don't really fluctuate over time, the data is said to have been created stationarily (Jeffrey M. Wooldridge, 2013).

There is proof that a unit root occurs in the data if any of these variables shift from their initial values. The juxtaposition connecting a stationary time series and a non-stationary data set can be drawn, also, with the non-stationary series generating erroneous and wrong data while the stationary series produces correct and reliable data.

### 3.4.1. Augmented Dickey-Fuller-ADF

As a result of their work, Dickey and Fuller (1979) developed and put into practice a software programmed to test their hypothesis. The programmed determines if a variable seems to have the unit root or, alternatively, if the variable has been submitted to the prior random walk. Hamilton (1994) proposes 4 scenarios that enhanced Dickey–Fuller test might be used to demonstrate the relevance and value of the enlarged Dickey–Fuller test. There is always a minimum unit root for a variable if one of the null hypotheses is true. This is true even if the other hypotheses are correct or not. There are major differences between the two methods. Whether a drifting term is also included in the null hypothesis in the first method, as well as whether a persistent search and a periodic tendency were included in the regression used to obtain the statistical test in the second approach, are major differences between the two procedures. Although it is essentially the same testing method as the Dickey–Fuller test, it is simulated and the results are recorded instead of the other way around, as was the case with the prior test.

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \delta_1 \Delta y_{t-1} + \dots + \delta_{p-1} \Delta y_{t-p+1} + \varepsilon_t$$

Due to the inclusion of delays of order  $p$  in the ADF formulation, higher-order autoregressive processes are possible. It must also be known how long the lag  $p$  is in order to use this test correctly with the data.

### 3.4.2. The ARDL Bound Test

Now that it is unclear if the data-collection technique underlying a time series is a trend or a first difference, stationary bound testing, a kind of ARDL modeling, is used in a univariate equilibrium correction system to determine how significant later levels of variables are to the system. More crucially, Haug (2002) asserts that when a small sample size is used, the ARDL limit testing technique is better suited to and produces better results, since both the short-and long-run parameters are computed simultaneously, resulting in a more accurate procedure.

Here's how the ARDL may represent the relationship between the exchange rate and economic growth:  $\text{GDP} = f(\beta_0 + \beta_1(\text{REER}) + \beta_2(\text{RIR}) + \beta_3(\text{INF}) + \beta_4(\text{BM}) + \epsilon t)$

### 3.5. Pearson's Correlation

To build statistically significant correlations between two or more variables, you must first evaluate if there is a link between them and, if so, how strong or how much of a link there is. The correlation coefficient may also be used to determine the strength of a relationship between two variables. In this research, a similar method will be utilized to compare the outcomes of the two sets of independent variables. In the case of linear relationships, the correlation coefficient may be utilized to make a rapid decision.

$$\text{Formula: } r = \frac{1}{n-1} \frac{(x-x')(y-y')}{\sigma_x \sigma_y}$$

Where, R represent Correlation

$\sigma_x$  donates Standard Deviation of X

$\sigma_y$  donates Standard Deviation of Y

n is the No. Of Observations

### 3.6. Analysis of Regression

It is feasible to characterize the connections between variables by using regression analysis. It is possible to anticipate or characterize the nature of a connection between two variables using regression analysis, which is a statistical method. It also has the ability to forecast the value of one variable as well as the value of another variable based on the values of both variables. This method allows researchers to construct a mathematical equation that describes the relationship between the dependent variable (GDP), which is the variable to be forecasted, and the independent variables, which are the factors that the researcher believes are linked to the dependent variable (GDP) (exchange rate, inflation, interest rate, and broad money). The equations below show how GDP and the independent variables (exchange rate, inflation, interest rate, and broad money) are linked together in the graphs.

$$GDP = f(\beta_0 + \beta_1 (REER) + \beta_2 (RIR) + \beta_3 (INF) + \beta_4 (BM) + \epsilon_t)$$

In the equation,  $f(\beta_0 + \beta_1 (REER) + \beta_2 (RIR) + \beta_3 (INF) + \beta_4 (BM) + \epsilon_t)$  where the coefficient  $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$  are to be control and  $\epsilon_t$  is the error term.

"GDP stands for Gross Domestic Product, and

The acronym "REER" stands for "Real Effective Exchange Rate."

The term "RIR" stands for "Real Interest Rate."

Inflation is abbreviated as INF.

BM is an abbreviation for Broad Money

### **3.7. Diagnostic and stability tests**

In parallel to the diagnostic tests indicated above, additional diagnostic tests are being employed in this study to determine the model's trustworthiness. The White (heteroscedasticity) test, the residual normality test (series correlation test), and the cointegration test are all examples of these tests. To regulate the degree of autocorrelation in the dataset, the residuals results should be displayed against the anticipated quantities, and the worth of the standardized residual values should be displayed against the relationship with the future, as well as the value of the residuals values. As a consequence of the F-statistics, we may conclude that the model has heteroscedasticity.

### **3.8. Granger Causality Test**

Founded on the fundamental principle that causes exist before their effects and those causes may be predicted, the idea of G-causality is useful in predicting the consequences of causes. Since Norbert Wiener introduced the notion, it has been applied by the econometrician Clive Granger (Granger, 1969) in the form of linear vector autoregressive (VAR) models of random time series data, with important extensions made by John Geweke and others in the following decades (Geweke, 1982). Virtually all regression models (VARs) are straightforward mathematical models in which the value of a variable at any given point in time is explained as a (linear) weighted total amount of the data point in the past (typically across a number of discrete time steps) and the value of a group of additional variables in the past. Time series are stored in each variable using vector random processes, which are a kind of random process. Each of the processes is reflected

by a distinct kind of variable. It is necessary to find the right weights to use in order to decrease estimate errors before attempting to effectively fit a VAR model; there are a variety of typical ways of doing this. In this context, a variable  $X$  is said to be "G-caused" by a variable  $Y$  if its past contains information that aids in the prediction of the future of  $Y$ , in addition to any information already present in  $Y$ 's past (and the past of any other "conditioning" variables  $Z$ ) at the time of the occurrence of  $Y$ . The presence of "information flow" from  $X$  to  $Y$  between the two sites may be defined as the achievement of this goal in a given situation. As a result, Barnett et al. (2009) argue that it is reasonable to utilise G-causality, which is an estimate of the amount of entropy transmitted. A guided version of Shannon's similarity measure is used in this application. Shannon's similarity measure is a way to figure out how statistically related two variables are or how much information they share.

## **CHAPTER FOUR**

### **4.0. RESULTS AND DISCUSSIONS**

#### **4.1. Introduction**

This chapter is divided into four parts. An overview of study findings is presented in the first section, which is followed by a discussion of the ways in which exchange rate has impacted the Nigerian economy and how that impact has been evaluated by academics. Descriptive statistics and data analysis methodologies, which were addressed in detail in the first portion of this research, are examined in depth in this section. After that, we will look at and explain the stationary test of a data set, and after that, we will look at and discuss co-integration, which will be another segment. This section will look at and explain a data set's stationary test. In the last portion, regression analysis, as well as diagnostic tests and data or result stability tests, will be covered in depth. This last section of teaching will bring the course to a conclusion. Despite this setback, the presentation was completed in line with the study goals, and the tests were completed using E-views software, all of which were successful.

#### **4.2. Stationary test**

As for two-unit root tests, this study comprised Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) experiments, and the results were analyzed using two-unit root tests as well. These metrics were chosen because they needed to be very precise and show a lot of contrast. If we look at the dependability of PP unit root tests, they outperform ADF testing, according to Hamilton (1994). If there is serial correlation or heteroscedasticity in your data, PP



unit root tests are more resistant than other forms of regression testing. This method has its own set of problems and benefits that must be taken into account as well, though. To assess the suggested autoregressive distributive lag (ARDL) system developed by Pesaran and colleagues, a unique estimation approach known as bounds testing will be employed in combination with the current estimation methods. Bounds testing, in addition to normal estimation methods, will be utilized to evaluate Pesaran and colleagues proposed autoregressive distributive lag (ARDL) system (Pesaran 1997, Pesaran, Shin & Smith 1999). To determine whether or not the difference was statistically significant, the p-value was compared to the threshold value of 0.05, which was used to determine statistical significance.

<b>ADF</b>						
Constant Without Trends				Constant With Trends		
Variables	LEVEL	1 <sup>st</sup> Different	Order of Integration	LEVEL	1 <sup>st</sup> Different	Order of Integration
REER	0.3199	0.0016***	I (1)	0.6088	0.0086***	I (1)
GDP	0.0739	0.0000***	I (1)	0.3739	0.0000***	I (1)
INF	0.2500	0.0006***	I (1)	0.2981	0.0026***	I (1)
RIR	0.6277	0.0002***	I (0)	0.8923	0.0005***	I (0)
BM	0.1561	0.0000***	I (1)	0.4338	0.0000***	I (1)

\*\*\* Model with intercept and trend at 1 percent level of significance \*\*at 5 percent level of significance \*at 10 percent level of significance \*\*\*source: Automatic selection = t- statistic p- value 0.1

In order to determine if the variables were stationary at 1st difference with and without trend, the trend unit root test was used in conjunction with ADF test statistics. The ADF test was used to illustrate stationarity at 1st difference in order to show stationarity at 1st difference, as stated above in the table, after the results of the trend unit root test were obtained. By doing a unit root computation on the data, we can conclude that the exchange rate has a positive impact on the Nigerian economy. After controlling for the first differences, the likelihood of a real effective exchange rate using the ADF is less than 0.05 percent (0.0016).

This shows that the series has achieved a condition of stationarity. Therefore, the null hypothesis that there is no unit root will be rejected as a consequence of this experiment. GDP growth has a probability smaller than 0.05 (0.0000) at the 1<sup>st</sup> difference of the distribution. This indicates that the series has achieved a condition of stationarity, which marks the end of the series. We flotsam the null hypothesis, which claims that there is no unit root of GDP, on the basis of the data presented in this paper. At both the level and the first difference, inflation probabilities were stationary. As a result, it may be concluded that the null hypothesis, which states that there is no unit root, will be disproven as well. There is a less than 0.05 chance that Real Interest Rate will be less than the threshold of 0.5. As a result, we can rule out the idea that there is no co-integration and say that there is co-integration between the variables in the model. The likelihood of broad money is greater than 0.05, indicating non-stationarity at the probability distribution level. Despite the fact that the t-statistic in the case of level is more than the essential threshold of 5%, the chance of the first difference is less than 0.05 percent, as indicated in the table above (0.0000). To put it another way, there is stationarity at the first difference in the set of differences. It is also feasible to argue that the null hypothesis, which states that there is no unit root, will be shown incorrect.

### 4.3. ARDL Bound Test

**Table 4.3: ARDL Bound Test**

Model	Lag.	F-Statistic	Decision
GDP, REER, RIR, INF, BM	(4, 4, 0, 4, 0)	6.965158***	Co-Integration Exist
Bond Critical Value			
		I (0)	I (1)
Sign.	10%	2.2	3.09
	5%	2.56	3.49
	2.5%	2.88	3.87
	1%	3.29	4.37

\*\*\*at 1percent level of significance \*\*at 5percent level of significance \*at 10percent level of significance  
 Source: Akaike info criterion (AIC) Pesaran et al. suggest the critical value bounds (2001)

#### **Bound test results from the ARDL long-run test**

In this research, a bound test is generated on the basis of the ARDL model to determine if or not co-integration took place in the data set at issue. The null hypothesis cannot be rejected if the F-statistic is smaller than the lower limit of the distribution (critical values for I (0)). If the statistic surpasses I (1), rather than being thrown out of consideration, the null hypothesis of no co-integration is ruled out (1). The test statistic is deemed inconclusive if it falls within the statistical process's range of possibilities. If we look at the F-statistic, we can figure out that the independent variables and the dependent variable have a long-term connection (6.965158).

#### 4.4. ARDL results

**Table 4.4: ARDL Long-run**

Variable	Coefficient	Prob.
BM	-0.46**	0.05
INF	-0.43***	0.01
REER	0.36***	0.01
RIR	-0.33	0.20
C	-3.89	0.16

Note \*\*\*represent significance at,1% \*\*\* 5%\*\* and \*10% respectively  
Source: Long-Run ARDL

Table 4.4 shows that, according to the data, the likelihood of an exchange rate reaction to the Nigerian economy is statistically significant in the long run at the 5% level of significance, with a probability for Broad Money (0.05) in the long run. Overall, this indicates that exchange rate has a beneficial influence on the Nigerian economy over a lengthy period of time. The null hypothesis of no co-integration is rejected, and we find that, at the 5% level of significance, broad money has a positive long-term impact. On the other hand, inflation, on the other hand, is statistically significant at the 5% level, with a probability of 0.01, and a coefficient of -0.43. When two things happen to be connected together in the long term, this is referred to as co-integration. This suggests that the null hypothesis, which holds that there is no long-term positive relationship between GDP growth and inflation, was rejected. The possibility of a real effect exchange rate is also less than the 0.5 percent threshold. As a result, null hypothesis will be rejected and there is a co-integration and argue that the exchange rate has a long-run impact on the Nigerian economy. The real interest rate is not statistically significant, with a probability of 0.20,

which is more than the 0.05 significance level. As a result, we find that RIR has no positive or long-term effect on the Nigerian exchange rate, and the null hypothesis is not rejected in this situation. According to this, exchange rate volatility contributes to 3.6 percent of GDP. That the exchange rate has a favorable impact on Nigeria's economic development is consistent with the findings of Ashar (2012), Akpan (2008), and Azeez et al. (2012). Economic growth, on the other hand, is negatively impacted by both the interest rate and the inflation rate. According to this, the greater the interest rate and inflation rate, the lower the GDP of a nation. Ashar found in 2012 that interest hurts economic growth, but the inflation rate does not match up with her findings.

**Table 4.5: Short-run ARDL**

Variable	Coefficient	Prob.
D (GDP (-1))	-0.34***	0.00
D(REER)	0.02***	0.01
D(BM)	-0.45**	0.03
RIR	-0.022***	0.00
ECT (-1)	-0. 89	0.00

Note \*\*\*represent significance at \*\*\*1% and \*\*5% 10% \*respectively  
Source: ECM

The influence of exchange rate on the Nigerian economy is shown in Table 4.5. D (GDP (-1)) has a probability of 0.00 percent, according to the statistics, and the influence of exchange rate reaction on the Nigerian economy is statistically significant at 5 percent. As a consequence, the null hypothesis of no co-integration is rejected, and we conclude that the variables at issue have a short-run connection. With a probability of 0.01 at the 5 percent level, Real Effective Exchange Rate is also statistically significant. As a result, the null hypothesis of co-integration is rejected, and it is inferred that there is a positive

impact between variables in the short run or that there is a positive connection between variables in the short run. The Broad Money D (BM) is statistically significant at the 5% level, with a probability of 0.03. It is found that there is a positive relationship between variables in the short term. To summarize, our study found that the exchange rate has a beneficial influence on economic growth, which is consistent with earlier findings (Asher, 2012; Azeez et al., 2012; and Obansa et al., 2012) that the exchange rate affects GDP.

#### 4.6: Residual Diagnostic test

**Table 4.6: Residual Diagnostic test result**

Name of the Test	The Null Hypothesis result	Statistics value	Probability
Serial Correlation Test	There is no serial correlation at up to two lags.	2.324000	0.1274
Jarque-Bera (JB) Examination	Normally, residuals are normally dispersed. at 5% level	0.364271	0.833488
White (CH-sq) Test	No conditional heteroskedasticity at 5%	0.857893	0.6180

Olsrr provides methods for determining whether regression assumptions are being violated. The remaining diagnostics are discussed here. The following residuals/errors are included in the conventional regression assumptions:

The erroneous data follows a bell curve (a normality assumption).

The erroneous values have been set to a value of 0.

The mistakes are all the same, but the variance is unknown (homoscedasticity assumption).

There is no connection between any of the issues (independent errors of assumption).

A normal distribution and a lack of serial correlation and conditional heteroskedasticity are demonstrated in Table 4.6, which is consistent with the hypothesis's predictions. They do not follow a normal distribution at all in reality. However, the alternative hypotheses imply that the model does have serial correlation, despite the null hypothesis showing otherwise. To make things more complicated, the likelihood of this happening is 0.1274%, which exceeds the 0.05% barrier by a factor of 2. In this case, the null hypothesis is accepted and the model's serial correlation is ruled out. The null hypothesis implies that the model does not exhibit heteroskedasticity at the 5% level. Once it has been tested, this model does not get stuck at the 5% barrier. If the probability value of 0.6180 is more than the threshold of 0.05 percent, this indicates that the problem is more serious than previously anticipated. Since we cannot reject the null hypothesis at 5%, we have no choice but to infer that the model does not have heteroskedasticity at this level. According to the null hypothesis, the data set is regularly distributed between 5% and 10% at this point. Residues are normally distributed at 5%. The Jarque-Bera probability is insignificant because the likelihood of 0.833488 is statistically greater than the 0.05 percent criterion. If the null hypothesis of cointegration is true, we can say that residuals are normally distributed at 5%.

**Table 4.7. Granger Causality Test**

Pairwise Granger Causality Test

Simple: 40

Logs: 2

Null Hypothesis:	Obs.	F-Statistic	Prob.
RIR does not Granger Cause GDP	38	0.80189	0.4570
GDP does not Granger Cause RIR		0.35510	0.7037
INF does not Granger Cause GDP	38	2.57656	0.0913
GDP does not Granger Cause INF		0.29483	0.7466
REER does not Granger Cause GDP	38	0.00236	0.9976
GDP does not Granger Cause REER		10.7821	0.0002**
BM does not Granger Cause GDP	38	0.78830	0.4630
GDP does not Granger Cause BM		0.52310	0.5975
INF does not Granger cause RIR	38	0.99524	0.3805
RIR does not Granger cause INF		1.79234	0.1824
REER does not Granger cause RIR	38	1.01717	0.3727
RIR does not Granger Cause REER		5.16713	0.0112**
BM does not Granger Cause RIR	38	0.98070	0.3857
RIR does not Granger Cause BM		0.13748	0.8721
REER does not Granger Cause INF	38	2.63393	0.0868
INF does not Granger Cause REER		3.75881	0.0338**
BM does not Granger cause INF	38	1.80801	0.1798
INF does not Granger cause BM		0.13589	0.8734
BM does not Granger cause REER	38	0.22917	0.7964
REER does not Granger cause BM		0.10762	0.8983



The null hypothesis of Granger Causality states that when the p value is greater than 5%, we should conclude that there is no causation between the variables; however, when the p value is less than 5%, we should conclude that there is causation between the variables, however, the Granger causality test reveals unidirectional causal relationships between variables. It indicates that inflation has general causality with Nigerian exchange rates at a 5% significance level. Furthermore, real GDP is statistically significant granger causality to REER at the 1% level, while RIR has statistically significant granger causality to REER at the 5% level.

#### **4.8. TR Stability test**

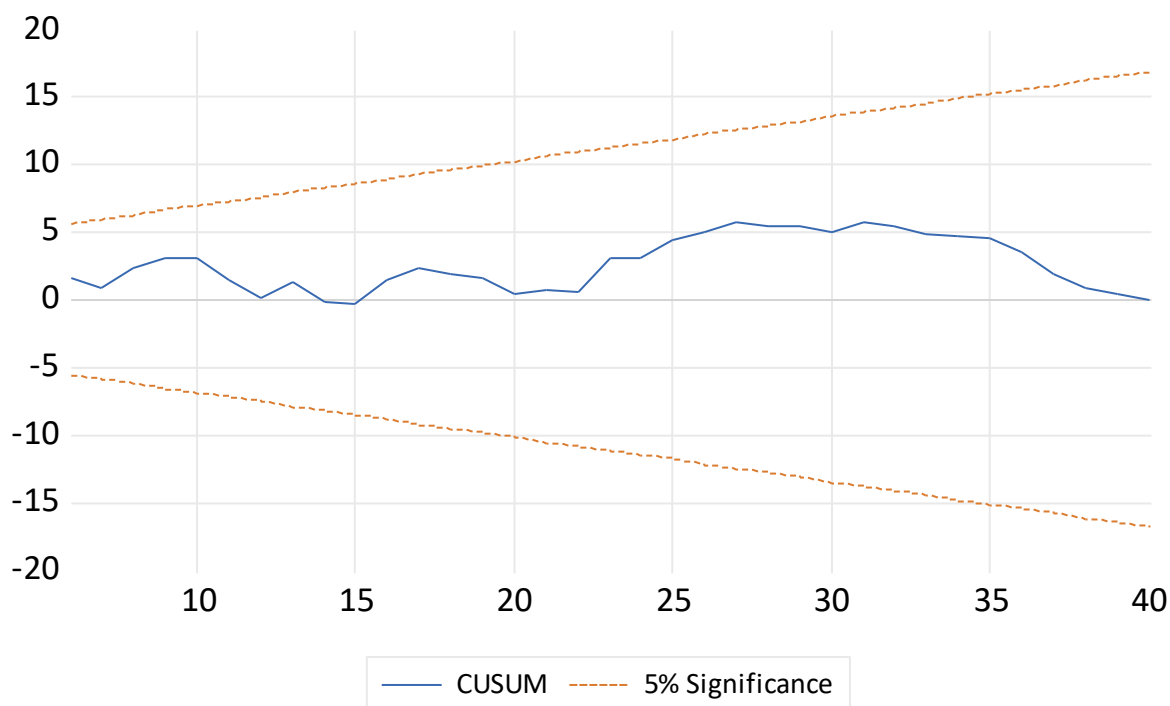
It is not uncommon for nonlinear models to be faced with the problem of parameter instability (Saliminezhad et al., 2018). As a result, in order to assess the correctness of the results, the stability of the estimated model that was utilized must be examined. To do this, we use the CUSUM of squares test, which was created by Brown and colleagues (1975).

Depending on how much you rely on the post estimation test, the model's stability must be ensured at all times during the estimating process (Hansen, 2000).

As part of a multiple linear regression analysis, Cusum tests look at the stability of coefficients. Recursive residuals (standardised one-step-ahead prediction errors) are produced iteratively from nested sub-samples of the data and sums, or sums of squares, of recursive residuals are used in inference. Under the null hypothesis that parameters stay the same, values outside the expected range of the sequence show that the model's structure has changed over time.

## 4.8 CUSUM TEST

Figure 4.8 CUSUM TEST



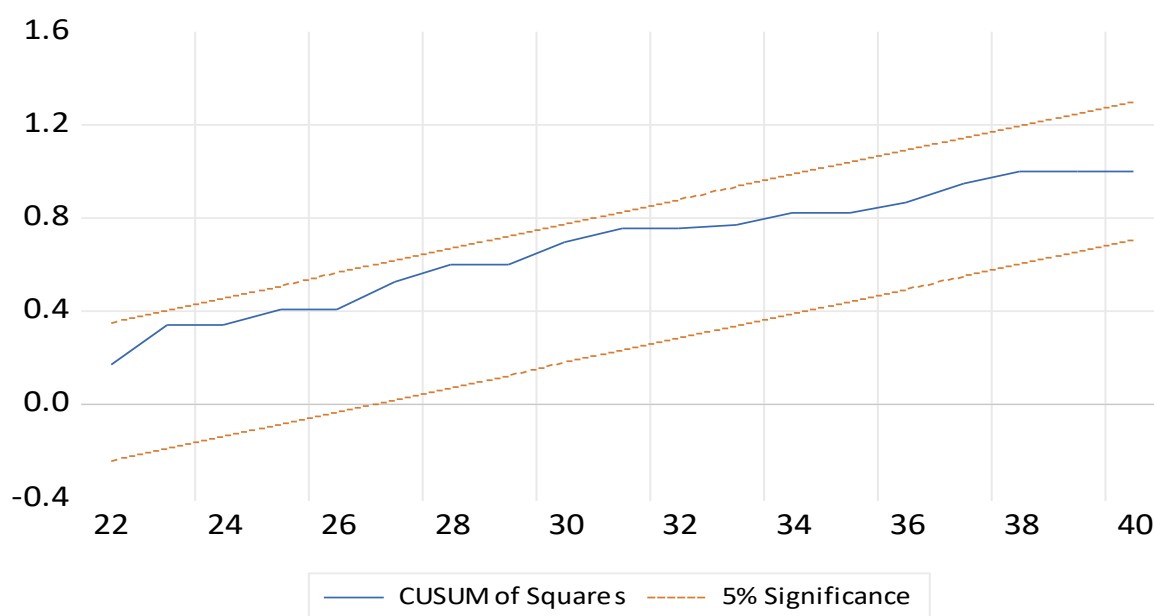
However, although there is a null hypothesis that states that the parameters are stable, the opposite hypothesis does not have such a hypothesis. Within a 5-percent confidence interval, the null hypothesis says that all error correction coefficients in the error correction model remain constant (Bahmani, Oskooee & Ng, 2002). The null hypothesis of coefficient consistency may be rejected at a 5% level of significance if any of the lines is crossed. For the long-term stability of the exchange rate coefficient, the plot of CUSUM and CUSUMQ data must remain within the crucial bounds shown in the figure above.

According to the results of the tests, the blue line is restricted to the boundaries of the red line. For added benefit, we wish to assume that residual variances are stable rather than unstable, so we accept the null hypothesis and reject the alternative hypothesis, as shown

in the figure. The residual variance, on the other hand, is also stable, not unstable, as we think from the data.

#### 4.9 CUSUM OF SQUARE TEST

**Figure 4.9 CUSUM OF SQUARE TEST**



There is a null hypothesis that says that the parameters are stable, but there isn't one for the other hypothesis. According to the test results, the blue line is limited to the bounds of the red line. To make things even better, we want to believe that residual variances are stable rather than unstable, so we accept the null hypothesis and reject the alternative hypothesis. We also infer that residual variance are stable rather than unstable. Lastly, in order to verify the long-term stability of the ARDL model's long-term coefficient with the short-term dynamics between the exchange rate and economic growth variables, the cumulative sum of recursive residuals (CUSUM) and the cumulative sums of squares (CUSUMQ) were used. Within

a 5-percent confidence interval, the null hypothesis says that all error correction coefficients in the error correction model remain constant (Bahmani, Oskooee & Ng, 2002). The null hypothesis of coefficient consistency may be rejected at a 5% level of significance if any of the lines is crossed. For the long-term stability of the exchange rate coefficient, the plot of CUSUM and CUSUMQ data must remain within the crucial bounds shown in the figure above.

## **CHAPTER FIVE**

### **5.0. overview, CONCLUSION AND RECOMMENDATIONS**

#### **5.1. Overview**

This thesis, which is based on practical research from the nation, investigates the impact of the exchange rate on Nigerian economic growth (1980–2019). The study was based on data obtained on a yearly basis. The subject of whether the exchange rate has a positive or negative impact on the development of the Nigerian economy is still being debated in economic circles. GDP growth, real effective exchange rate, inflation, broad money, and real interest rate were the predictor variables used. The information for this study was acquired using descriptive research methodologies. We were able to get secondary data from the World Bank and use EViews software to look at it. The F-statistic obtained after doing an ARDL Bound test was (6.965158). Because of this, we can say that the two independent variables and the dependent variable have been connected for a long time. There is a 5% chance that the stock market will react to changes in the exchange rate, according to the long-run co-integration test that the study used.

It is associated with a positive coefficient. As a result, as GDP increases, the exchange rate increases by 0.36 percent over the course of time.

According to the results of the short-run ARDL co-integration test, the likelihood of an exchange rate response to GDP is statistically significant. The exchange rate is linked to a positive coefficient. When the dollar exchange rate rises, so does the country's overall output (GDP).

According to the normality test, the residuals are not normally distributed at 5%; nonetheless, the parameters are stable at that percentage, according to the stability test. Adelowokan, Adesoye, and Balogun (2015) investigated the influence of exchange rate variations on Nigerian economic growth and investment from 1986 to 2014. They used the ADF test for stationarity and the error correction approach to perform their investigation. GDP, investment, the currency rate, the interest rate, and inflation are among the factors utilized. The research also discovered a relationship between currency volatility, investment, and economic development.

An association was also discovered between inflation, interest rates, and the exchange rate. Their recommendation was that Nigeria creates a robust exchange rate management system in order to promote the country's economic development.

## **5.2. Conclusion**

When it comes to Nigeria's economic development, it was discovered that the exchange rate had a beneficial influence when compared to other parameters like GDP, the real interest rate, broad money, and the inflation rate.

Furthermore, the link between the exchange rate and economic development in Nigeria has been positive from 1980 to the present. According to the study's findings, currency rates are an important determinant of Nigerian economic development. According to the study's conclusions, a 5% exchange rate is critical in the long run and has a beneficial influence on Nigeria's economy's development in the short term.

Over time, the exchange rate has a significant effect on the economy, and it is largely favorable. Over the long run, broad money has a beneficial impact on the stock market's development, and this influence is statistically significant. They were, however, unable to demonstrate a long-term relationship between foreign direct investment and stock market development in Nigeria. The impact of Nigeria's economic progress on the actual exchange rate disparity between the naira and the dollar was investigated by Ali, Omotosho, Ajibola, and Adele (2015). This research used data from quarterly polls conducted between 2000 and 2014.

It was determined by measuring the real exchange rate's deviation from an equilibrium path of sustainable behavior that the estimated real exchange rate misalignment was computed using the behavioral rate of equilibrium exchange approach. According to the conclusions of the research, Nigeria's economic growth has been negatively impacted by the actual misalignment of the currency rate. Their recommendations included the employment of a market-based exchange rate system indefinitely to guarantee that the Naira's exchange rate continues a steady course over the long term in the future. In the short term, the research revealed that when using the error correction technique, the foreign exchange rate has a statistically significant relationship with the development of the economy and has a good impact on the growth of the economy. Aliyu et al. (2009) used data from the Central Bank of Nigeria to analyze currency rate pass-through in Nigeria from 1986 to 2007. Quarterly series were used in combination with the estimation of a vector error correction model as part of the estimation phase. The authors discovered that exchange rate pass-through in Nigeria was low and declined throughout the price chain during their study period, which partially contradicts the literature's conventional

wisdom that exchange rate pass-through is always significantly higher in developing countries than in developed countries. As a result of this finding, the authors argue that pass through will almost certainly increase in the long run, and that monetary policy should be adjusted to account for this effect. Several studies have shown a statistically significant relationship between the exchange rate and GDP in the short run, as well as favorable correlations in both the long and short term.

### **5.3. Recommendation**

Consider that the exchange rate is an important component of global economic system because it is the primary mechanism of transferring foreign currencies from depositors to borrowers. This is important to remember since the function of the exchange rate in the economy is critical for the whole world (Samea et al., 2014). When it comes to the impact of macroeconomic variables on the exchange rate, there are both good and bad things that happen when the exchange rate changes. The Nigerian government should do a lot of different things to make sure that the country is stable politically, that enough infrastructure is built, and that foreign currencies and interest rates stay the same through good macroeconomic policy. According to the findings of this research, strategies should be implemented in order to maintain a steady inflation rate. In recent years, the GDP of Nigeria has increased, which may be an indicator that international investors are gaining confidence in the country's economy and its ability to remain stable in the face of global economic uncertainty. A high interest rate has been demonstrated to be connected with economic development, but only in a minor way, according to the conclusions of the study, and the central bank of Nigeria should set an interest rate that would aid in attracting investors to the country. Since it has been proved to have a good effect on the economic



development of the nation, it is recommended that a policy be implemented by the government to encourage an environment favorable to the execution of business activities to support economic growth. The growth of an economy may be slowed by an increase in the exchange rate. As a result of this reality, policymakers should endeavor to retain exchange rates at levels that do not hold back economic growth. Foreign currency should be prohibited in developing nations such as Nigeria, and all foreign currency should be exchanged for local currency at the Nigerian Central Bank or a commercial bank such as the one in your city.

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## APPENDIX

### Appendix 1 unit root exchange rate

Null Hypothesis: NIGERIA\_NGA\_REAL\_EFFECTIVE\_EXCHANGE\_RATE\_INDEX\_\_2010\_\_\_10...

Exogenous: Constant

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

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-1.920258</b>	<b>0.3199</b>
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

Null Hypothesis: D(NIGERIA\_NGA\_REAL\_EFFECTIVE\_EXCHANGE\_RATE\_INDEX\_\_2010\_\_\_...

Exogenous: Constant

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

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-4.298398</b>	<b>0.0016</b>
Test critical values:		
1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

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

### Appendix 2-unit root for GDP growth

Null Hypothesis: GDP has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-2.758571</b>	<b>0.0739</b>
Test critical values:		
1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

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

Null Hypothesis: D(GDP) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-11.63398</b>	<b>0.0000</b>
Test critical values: 1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation

### Appendix 3-unit root Inflation

Null Hypothesis: INF has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-5.825559</b>	<b>0.0000</b>
Test critical values: 1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

### Appendix 4 -unit root broad money

Null Hypothesis: NIGERIA\_NGA\_BROAD\_MONEY\_\_\_\_OF\_GDP\_\_FM\_LBL\_BMNY\_GD\_ZS has...  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-2.371558</b>	<b>0.1561</b>
Test critical values: 1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

Null Hypothesis: D(NIGERIA\_NGA\_BROAD\_MONEY\_\_\_\_OF\_GDP\_\_FM\_LBL\_BMNY\_GD\_ZS) ...  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-9.089540</b>	<b>0.0000</b>
Test critical values:	1% level	-3.615588
	5% level	-2.941145
	10% level	-2.609066

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

### Appendix 5 -unit root interest rate

Null Hypothesis: NIGERIA\_NGA\_REAL\_INTEREST\_RATE\_\_\_\_FR\_INR\_RINR has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

	t-Statistic	Prob.*
<b>Augmented Dickey-Fuller test statistic</b>	<b>-4.569301</b>	<b>0.0007</b>
Test critical values:	1% level	-3.610453
	5% level	-2.938987
	10% level	-2.607932

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

### Appendix 6 long run bond test

F-Bounds Test

Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	6.965158	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

## Appendix 7 ARDL LONG RUN

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NIGERIA_NGA_BROAD...	-0.468162	0.233294	-2.006743	0.0592
NIGERIA_NGA_INFLAT...	-0.431626	0.169767	-2.542457	0.0199
NIGERIA_NGA_REAL_...	-0.007628	0.021713	-0.351331	0.7292
NIGERIA_NGA_REAL_I...	-0.333463	0.252855	-1.318792	0.2029
C	21.02004	5.838134	3.600472	0.0019

## Appendix 8 ARDL SHOT RUN

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(NIGERIA_NGA_GDP...	-0.342887	0.110961	-3.090164	0.0060
D(NIGERIA_NGA_GDP...	0.114090	0.137701	0.828537	0.4177
D(NIGERIA_NGA_GDP...	0.319566	0.116968	2.732082	0.0132
D(NIGERIA_NGA_BRO...	-0.455398	0.194571	-2.340529	0.0303
D(NIGERIA_NGA_BRO...	0.352461	0.198517	1.775473	0.0918
D(NIGERIA_NGA_BRO...	0.720072	0.199096	3.616708	0.0018
D(NIGERIA_NGA_BRO...	0.380914	0.168652	2.258586	0.0359
D(NIGERIA_NGA_REAL...	0.023682	0.009179	2.580086	0.0183
D(NIGERIA_NGA_REAL...	0.003055	0.007947	0.384449	0.7049
D(NIGERIA_NGA_REAL...	0.006116	0.007659	0.798498	0.4344
D(NIGERIA_NGA_REAL...	-0.022601	0.007209	-3.135071	0.0055
CointEq(-1)*	-0.890040	0.122501	-7.265574	0.0000

## Appendix 9 Heteroskedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

F-statistic	0.857893	Prob. F(16,19)	0.6180
Obs*R-squared	15.09937	Prob. Chi-Square(16)	0.5174
Scaled explained SS	3.352843	Prob. Chi-Square(16)	0.9996

Test Equation:

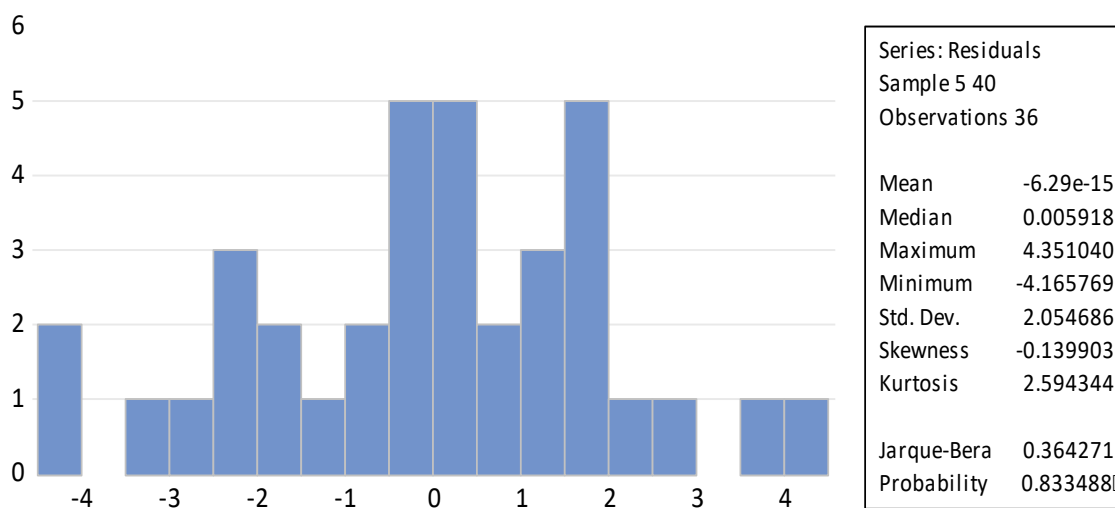
## Appendix 10 Serial correlation test

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	2.324000	Prob. F(2,17)	0.1282
Obs*R-squared	7.729491	Prob. Chi-Square(2)	0.0210

## Appendix 11 Normality test



## Appendix 12 Granger causality

Pairwise Granger Causality Tests

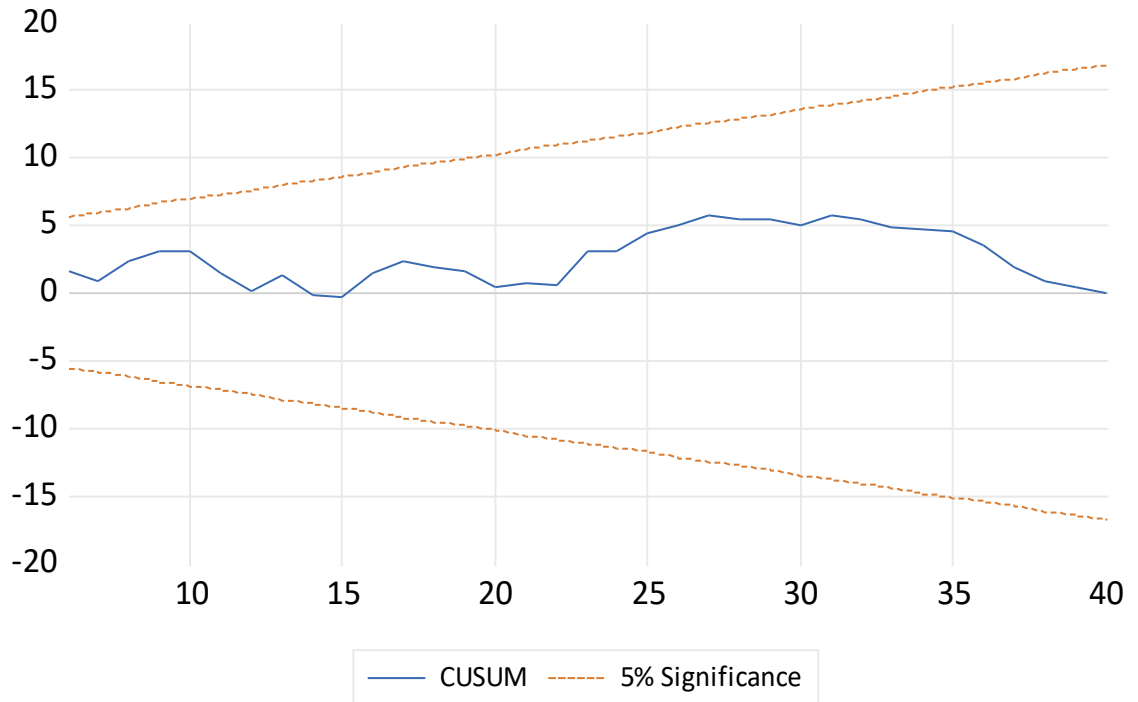
Date: 03/26/22 Time: 12:15

Sample: 1 40

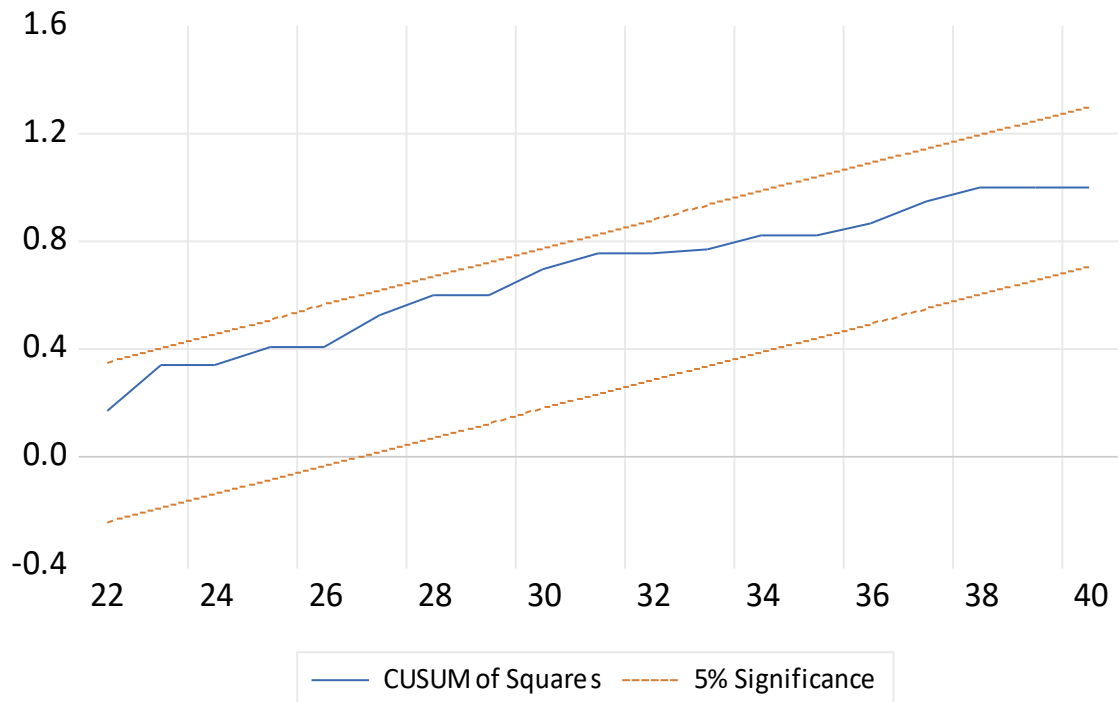
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
RIR does not Granger Cause GDP	38	0.80189	0.4570
GDP does not Granger Cause RIR		0.35510	0.7037
INF does not Granger Cause GDP	38	2.57656	0.0913
GDP does not Granger Cause INF		0.29483	0.7466
REER does not Granger Cause GDP	38	0.00236	0.9976
GDP does not Granger Cause REER		10.7821	0.0002
BM does not Granger Cause GDP	38	0.78830	0.4630
GDP does not Granger Cause BM		0.52310	0.5975
INF does not Granger Cause RIR	38	0.99524	0.3805
RIR does not Granger Cause INF		1.79234	0.1824
REER does not Granger Cause RIR	38	1.01717	0.3727
RIR does not Granger Cause REER		5.16713	0.0112
BM does not Granger Cause RIR	38	0.98070	0.3857
RIR does not Granger Cause BM		0.13748	0.8721
REER does not Granger Cause INF	38	2.63393	0.0868
INF does not Granger Cause REER		3.75881	0.0338
BM does not Granger Cause INF	38	1.80801	0.1798
INF does not Granger Cause BM		0.13589	0.8734
BM does not Granger Cause REER	38	0.22917	0.7964
REER does not Granger Cause BM		0.10762	0.8983

### Appendix 13 CUSUM TEST



### Appendix 14 CUSUM OF SQUARES TEST





# Thesis

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