



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

**THE EFFECT OF EXCHANGE RATE FLUCTUATION ON  
THE NIGERIAN ECONOMIC GROWTH (1980–2020)**

**MSc. THESIS**

**ARCHIE ROOSEVELT MARTU**

**Nicosia  
December, 2022**

**ARCHIE ROOSEVELT**

**MARTU**

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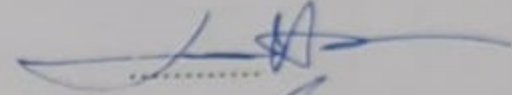
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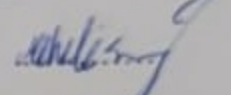
### Approval

After a careful scrutiny of the thesis title "THE EFFECT OF EXCHANGE RATE FLUCTUATION ON THE NIGERIAN ECONOMIC GROWTH (1980-2020)," submitted by ARCHIE ROOSEVELT MARTU. It has met the unanimous consensus and in our combine opinion, it is fully adequate, in scope and in quality, as a thesis for the degree of Master Educational Sciences, and hereby recommended for approval and acceptance. Examining Committee Name-Surname  
Signature

Head of the Committee: Assoc. Prof. Dr. Turgut Tursoy



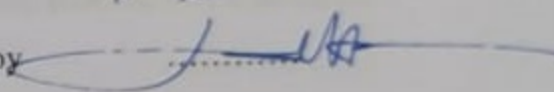
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### **Declaration**

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

ARCHIE ROOSEVELT MARTU

...../...../.....

## **Dedication**

God, in his infinite wisdom, has provided me with the fortitude to complete this thesis. To my parents, Mr. and Mrs. Andrew Wesseh Martu, I also dedicate this thesis. I want to thank my mother, Mrs. Diacon Mammie Youwahday Bedell Martu, for everything she has done for me and for everything she continues to do for me; I also want to thank my siblings, Olive, Vickey, Williams, Slebo, Cecelia, Bernice, Annie, and Christina, for their help and encouragement throughout my time in school. My future bride, Miss Gabrielle Le-Hannah Naomi Johnson, and my grandmother, Mrs. Elizabeth Juah Seboe Goe, are other important people in this story.

To conclude, I would like to thank everyone who has offered me encouragement and guidance throughout the years.

## **Acknowledgement**

I would like to take this time to thank my advisor, and supervisor, Assistant Professor Tursoy Turgut, and my lecturer Ali Mumtaz, for their unwavering patience, knowledge, and support throughout my graduate studies. From the very beginning to the very end, this has been difficult. To that end, I want to say thank you to the Almighty God for providing me with the insight and knowledge I needed to complete my study. I don't have the words to explain how grateful I am to my mom, Mrs. Diacon Mammie Youwahday Bedell Martu. For a woman and a mother, there has never been anyone better than you. Prof. Dr. Samour Ahmed, who has been my instructor, is an excellent educator; I am grateful to him for his support and advice throughout my studies. This is the last chance I will have to thank my grandmother, Mrs. Elizabeth Juah Seboe Goe, for all the good she has done in my life and the constant words of encouragement she has spoken to me. I want to thank Mr. Clarence D.M. Zoker for all of the assistance he gave me when I was working on my thesis. Thank you also to all of the professors at Near East University. Please know how much I value the time and work you all put into imparting knowledge to me over the course of this academic year. I would like to thank my friend, brother and partner Mr. Ernest K. Kamara who has offered me encouragement and guidance throughout my stay in the Turkish Republic of Northern Cyprus, I also want to acknowledge Hawa Massaley and my friend and sister Gladys Yanwala Kpangbala for their role played. My eternal gratitude goes out to my father, Mr. Andrew Wesseh Martu, for his unending support and encouragement. To Mrs. Sarah Bedell Johnson, Mr. George Goe, Pastor Walker Goe, and Mrs. Bethshela Goe Benson, I am eternally grateful for all of the love and support they have shown me during my academic career. In conclusion, I'd want to express my gratitude to everyone at Near East University (TRNC) for providing me with the opportunity to earn my master's degree and for the life-changing education I received while there. I appreciate it, and I pray that God showers his blessings onto you.

**Archie Roosevelt MARTU**

## **Abstract**

### **The Effect of Exchange Rate Fluctuation on The Nigerian**

**Economic Growth (1980–2020)**

**ARCHIE ROOSEVELT MARTU**

**Department of Banking and Finance**

**December, 2022, 99 Pages**

This thesis investigates the effect that fluctuations in the exchange rate have had on the economic growth of Nigeria between the years 1980 and 2020. The percentage difference between the purchase price and the selling price of two currencies is referred to as the currency conversion rate or the exchange rate. This difference, in essence, indicates the exchange rate between the two currencies (Adebowale and Akosile. 2018). In addition to this, it determines the degree of participation of the private sector in global trade as well as the total prices of both domestically produced and imported commodities. For the purpose of determining cointerrelation, this study used both the ARDL bound and the Granger causality test. According to the findings, the real exchange rate, foreign direct investment, and broad money all have a large and negative influence on Nigeria's economic development, whereas interest rates have a positive and negative impact on economic growth in both the long and short run. This study recommends that future research investigate the connection between exports of goods and services, foreign direct investment, international investment in the capital market of Nigeria, and variations in the value of Nigeria's currency. It is the responsibility of the government to encourage export promotion strategies in order to maintain a trade surplus, as well as to cultivate a hospitable environment, sound fiscal and monetary policies, sufficient levels of security, and well-developed infrastructure facilities in order to entice foreign investors to make investments in Nigeria. We think that the interest rate should be kept under control.

**Keywords:** Broad money. Exchange rate, Foreign direct investment, economic, real interest

## Özet

### Döviz Kurundaki Dalgalanmanın Nijerya'ya Etkisi

#### Ekonomik Büyüme (1980–2020)

#### ARCHIE ROOSEVELT MARTU

#### Bankacılık ve Finans Bölümü

#### Aralık2022, 99 Sayfa

Bu tez, 1980 ve 2020 yılları arasında döviz kurundaki dalgalanmaların Nijerya'nın ekonomik büyümesi üzerindeki etkisini araştırmaktadır. İki para biriminin satın alma fiyatı ile satış fiyatı arasındaki yüzde farkı, para birimi dönüştürme oranı veya para birimi dönüştürme oranı olarak anılır. Döviz kuru. Bu fark, özünde iki para birimi arasındaki döviz kurunu göstermektedir (Adebowale ve Akosile. 2018). Bunun yanı sıra, özel sektörün dünya ticaretine katılım derecesini ve hem yurt içinde üretilen hem de ithal edilen emtiaların toplam fiyatlarını belirlemektedir. Eş-ilişkiyi belirlemek amacıyla, bu çalışmada hem ARDL sınırı hem de Granger nedensellik testi kullanılmıştır. Bulgulara göre, reel döviz kuru, doğrudan yabancı yatırım ve geniş para Nijerya'nın ekonomik gelişimi üzerinde büyük ve olumsuz bir etkiye sahipken, faiz oranları hem uzun hem de kısa vadede ekonomik büyüme üzerinde olumlu ve olumsuz bir etkiye sahiptir. Bu çalışma, gelecekteki araştırmaların mal ve hizmet ihracatı, doğrudan yabancı yatırım, Nijerya sermaye piyasasındaki uluslararası yatırım ve Nijerya para biriminin değerindeki değişimler arasındaki bağlantıyı araştırmasını önermektedir. Ticaret fazlasını korumak için ihracatı teşvik stratejilerini teşvik etmenin yanı sıra misafirperver bir ortam, sağlam maliye ve para politikaları, yeterli düzeyde güvenlik ve iyi gelişmiş altyapı tesisleri geliştirmek hükümetin sorumluluğundadır. Yabancı yatırımcılar Nijerya'da yatırım yapacak. Faizin kontrol altında tutulması gerektiğini düşünüyoruz.

**Anahtar Kelimeler:** Geniş para. Döviz kuru, Doğrudan yabancı yatırım,ekonomik,reel faizÖz



## Table of Contents

|                         |    |
|-------------------------|----|
| Approval .....          | 2  |
| Declaration .....       | 3  |
| Dedication .....        | 4  |
| Acknowledgement.....    | 5  |
| Abstract .....          | 6  |
| Öz .....                | 7  |
| Table of Contents ..... | 8  |
| List of Table .....     | 10 |
| List of Figures .....   | 10 |
| Abbreviations .....     | 11 |

### CHAPTER I

|                                   |    |
|-----------------------------------|----|
| Introduction .....                | 12 |
| Statement of the Problem .....    | 17 |
| Purpose of the Study .....        | 19 |
| Significance of the Study .....   | 19 |
| Statement of the Hypothesis ..... | 20 |
| Limitations of the study.....     | 21 |
| Definition of Terms .....         | 21 |

### CHAPTER II

|   |    |
|---|----|
| Literature Review .....                             | 23 |
| Theoretical Framework .....                         | 23 |
| Purchasing Power Parity.....                        | 27 |
| The Monetary Model of Exchange Rates.....           | 27 |
| The Portfolio Balance Approach .....                | 28 |
| Conceptual Model .....                              | 29 |
| Conceptual Framework.....                           | 29 |
| An Overview of Naira Exchange Rate Management ..... | 29 |
| Exchange Rates Policy .....                         | 31 |
| The Fixed Exchange-Rate Policy .....                | 33 |
| Exchange rate volatility concept .....              | 34 |
| Exchange Rate Regime Determinants .....             | 35 |

|  |    |
|--|----|
| Fluctuations and Exchange Rate Regimes .....                             | 37 |
| Empirical Review .....   | 38 |
| Broad money and economic growth empirical literature .....               | 41 |
| Foreign direct investment and economic growth empirical literature ..... | 43 |

### CHAPTER III

|  |    |
|--|----|
| Data and Methodology .....   | 46 |
| Introduction .....   | 46 |
| Data .....   | 46 |
| Data Gathering and Sources. ....                                   | 47 |
| Variables and Usage .....  | 47 |
| Model specification. ....  | 53 |
| Descriptive Statistics .....                                       | 54 |
| Stationary test .....  | 54 |
| Property of Time Series Data and Stationarity .....                | 55 |
| Procedure when one has data that is not stationarily aligned ..... | 55 |
| ADF UNIT ROOT TEST .....   | 56 |
| ARDL BOUND TEST .....  | 56 |
| ARDL MODEL .....   | 57 |
| RESIDUAL DIAGNOSTIC .....  | 58 |
| Serial correlation LM test .....                                   | 58 |
| Heteroskedasticity test .....                                      | 59 |
| Normality test. ....   | 59 |
| Granger Causality Test .....                                       | 59 |
| Stability test .....   | 61 |
| Conclusion .....   | 61 |

### CHAPTER IV

|   |    |
|---|----|
| Introduction .....                            | 63 |
| Descriptive Statistics .....                  | 64 |
| Unit root .....                               | 65 |
| ARDL bound test.....                          | 66 |
| Long-Run ARDL and short run .....             | 68 |
| Pairwise Granger Causality Test .....         | 72 |
| Cusum and Cusum of Squares Test Results ..... | 73 |

|                     |    |
|---------------------|----|
| Stability test..... | 74 |
|---------------------|----|

## CHAPTER V

|                                      |    |
|--------------------------------------|----|
| Conclusion and Recommendations ..... | 75 |
| Overview .....                       | 75 |
| Conclusion .....                     | 81 |
| Recommendation .....                 | 84 |
| REFERENCES.....                      | 85 |
| APPENDICES .....                     | 90 |

### List of Table

|   |    |
|---|----|
| <b>Table 4.1</b> Descriptive Statistics .....       | 64 |
| <b>Table 4.2</b> ADF unit test. ....                | 66 |
| <b>Table 4.3</b> ARDL bound test. ....              | 67 |
| <b>Table 4.4</b> ARDL long and short run test ..... | 68 |
| <b>Table 4.5</b> Residual diagnostic .....          | 70 |
| <b>Table 4.6</b> Granger Causality Result .....     | 72 |

### List Of Figures

|  |    |
|--|----|
| <b>Figure 1.1</b> Conceptual Model .....         | 29 |
| <b>Figure 4.1</b> Cusum Results .....            | 73 |
| <b>Figure 4.2</b> CUSUM of Squares Results ..... | 73 |

## Abbreviations

- REER:** Real effective exchange rate
- BM:** Broad money
- FDI:** Foreign direct investment
- INF:** Inflation rate
- RIR:** Real interest rate
- GDP:** Growth Domestic Products
- IMF:** International Monetary Fund
- PPP:** Purchasing Power Parity
- ARDL:** Autoregressive distributed Lag
- LDCs:** Least Developed Countries
- ADF:** Augmented Dickey-Fuller
- FEM:** foreign exchange market
- BOP:** Balance of Payment
- RIR:** Real Interest Rate
- CBN:** Central Bank of Nigeria
- SAP:** structural adjustment programme
- CBN:** Central Bank of Nigeria
- WDI:** world development indicator
- DLS :** Distributed Lag Scheme
- OCA:** Theory of Optimal Currency Area

## **CHAPTER I**

### **Introduction**

Currency conversion or exchange rate refers to the percentage difference between the buying and selling prices of two currencies, in essence, it represents the exchange rate between two currencies (Adebowale, & Akosile 2018). It also selects the level of external sector collaboration in the worldwide exchange as well as the overall costs of domestic and imported goods. Both interest rate and exchange rate management have continued to be major topics of discussion in the international marketplace and amongst developing countries, with the former viewing exchange rate advancement as crucial to economic growth (Obansa, et al, 2018). Since the floating exchange rate system was introduced, currency values have fluctuated widely and irrationally, with no discernible correlation to changes in the underlying macroeconomic fundamentals, and that was after the breaking down of the agreement of Bretton Woods in the 1970s.

In light of this, the interest in the currency rate has spiked, following the Bretton Woods system in the 1960s, a fixed exchange rate in Nigeria has been maintained up to the 1970s. Since 1980, however, and especially since 1986, the exchange rate has been floating. Since adopting the floating foreign exchange determination mechanism, currency rates have favored its counterparts over Nigeria. While uncivilized conversion scales or reliable variations have remained a noticeable deterrent to the financial growth of Nigeria, including many countries in Africa, a swapping scale (privilege or legitimate) has used financial development in the economies of most developed countries as one of the most important elements.

The regulated and deregulated regimes of Nigeria's currency rate have occurred during distinct time periods. Nigerian Naira exchange rate, was reasonably stable from 1973 and 1979, when more than 70% of the nation's GDP represents agricultural products, and during the period of the oil boom (Enilolobo, et al, 2017). After the Structural Adjustment Program (SAP) was approved by the federal government in 1986, the nation transitioned to an organization of flexible conversion scale from that of a peg organization, where the market forces were entirely managed by swapping scale. Instead, the directed float is the standard system, in which financial experts intermittently mediate in the international trade market for the achievement of some crucial goals. This lack of soundness and methodological

inconsistency in scale-swapping methods contributed to the unstable character of the naira rate.

According to research by Aderemi, et al, (2019) the value of the naira has decreased from the 1980s to the present, from \$1=N360 to the current rate of \$1=N360. This is despite the fact that the government has made numerous attempts to maintain a consistent exchange rate. For the purpose of reducing potentially disruptive ephemeral capital inflows, we outline an outside trade organization architecture that takes into account the age and allocation of remote trade assets. Therefore, the Central Bank monitors the usage of those rare outside trade assets with the end goal of ensuring that distant trade usage and dissemination are in harmony with monetary requirements along with the outside trade spending plan.

There have been four major transitional periods in Nigeria's approach to organizing the scales of exchange: the period (1959–1985) of fixed parity in the British pound sterling and with the United States dollar, the choice period (1986–1994) of the second-level remote trade advertise (SFEM), the introduction period (1995–1999) of the free independent outside exchange and trade market (AFEM), and the period introduction (2000–2010) of the between bank external trade showcase (IFEM). The basic ease of the Nigerian conversion scale technique was established (CBN) due to the formation of the Nigerian Central Bank in 1959. Specifically, The Nigerian Central Bank was established to manage the nation's money with the goal of achieving a stable and solid national currency. The primary scaling procedure mastered in Nigeria was the pegged conversion standard system. The Nigerian Central Bank was in control of acquiring and transporting foreign currency within Nigeria. According to Obaseki (2019), The Nigerian pound was steady by 195 at standard with the pound sterling Ordinance Central Bank.

An act (The Exchange Control Act), created by the Nigerian Central Bank in 1962, gave the finance minister the authority to authorize exchanges for foreign commerce, while the Nigerian Central Bank handled exchanges for the private sector through authorized merchants or commercial banks.

The Nigerian pound and the pound sterling were eliminated in 1962, which was a significant change (the first). The 1962 Demonstration established the gold value of the Nigerian pound, implying that Nigeria had the authority to set the official exchange rate between the naira and other currencies like the pound sterling. It's clear message to the international community that Nigeria, as a sovereign nation, was

allowed to make its own choices. Although in 1967 the pound sterling devaluation had no effect on the Nigerian naira, it did lend credence to the ingenuity of the operation.

When the currency of Nigeria was switched from pound to naira in 1973, it was the second big change. This time, the charge knowledge of self-sufficiency seems to have been ignored, and the deal was resolved in US dollars. As the value of the dollar fell in 1973, so did that of the naira. As a result of the dollar's persistent devaluation, the decline persisted. With this in mind, at the close of 1973, the government of Nigeria decided to detach the naira from its direct peg to either the US dollar or the pound sterling. Due to detachment, the naira's currency system had a burst of activity in 1974–1975. In a huge way, the oil explosion improved this setup. The currencies of Nigeria were tied to a basket of seven of Nigeria's real trading partners' currencies, including the US and other nations. It was anticipated that the naira would initially remain stable since any loss in incentive caused by the devaluation of one currency in the container would be made up for by the gratitude or appreciation of another currency in the container. The strategy was then used as a tool for mitigating changes in the effects on local costs and installment equalization in the scale of the outside conversion. It is fundamental to realize that Nigeria built up substantial remote stores as a result of the oil impact from roughly 1973 to late 1977, Nigeria amassed large distant stores resulting from the oil impact. Private overflow demand was handled by official hold exhaustion, but there was hesitation to downgrade when the save change turned out to be too small to support the fixed exchange rate. An import approval system was implemented by the national bank to monitor and regulate foreign trade conducted remotely. The problem was that when reserves grew, so did the value of the naira, but the currency was not allowed to fall in value as reserves dwindled. As a result, it seemed plausible that the established conversion scale routine might be maintained indefinitely by means of continuous release on the official stores. In this vein, stringent measures to regulate international trade were adopted. These included the following: the reduction of the dispatch table for consulting and specialized fees from 60% to 50% of remote counseling organizations; the reduction of the maximum length of each work trip from 15 to 14 days; the reduction of the basic travel reimbursements to travelers in general; etc. Both the Proclamation of 1977 (Exchange Control- against damage), which established councils to pursue the Comprehensive Import Supervision Scheme

(CISS), and, foreign trade offenders, which ensured an accurate examination of the volume, costs, and nature of imported goods that worth more than \$33,000, were added to these. The plan also included measures to prevent other unfair trade practices, such as overcharging for imports, undercharging for imports, importing outdated and spoiled food products and expired medications, distorting reports, and making remote trade claims for people who haven't arrived or services that haven't been rendered in order to maintain the inefficiency of national government projects. The degree of trade control decreased between 1980 and 1981, primarily as a result of advancements in the ability to calculate payments made as a result of gains made in the global oil market. The issue associated with strict trade control constraints also contributed to this arrangement inversion. The somewhat more lenient system of exchange restrictions in place in the early 1980s was largely abandoned for policing heinous mistreatment and neglect in the transactions of foreign exchange, such as smuggling goods and cash across borders, over-invoicing of import taxes, and falsifying import bills. Those years between 1982 and 1986 showed that Nigeria's last time of approaching trade restraints was between 1959 and 1993. Strict trade restriction measures from former eras were abolished through a comprehensive equalization of installment weights. Oil and non-oil export earnings consistently fell short of covering the cost of imports. For instance, during the years 1981 and 1984, the sum of ticket sales did not equal total imports. As a result, people were forced to rely on short-term external advances to make up for currency shortages, which led to a decline in foreign reserves and an increase in foreign debt.

Foreign currency, or FX, consists of convertible monetary standards generally accepted as payment for international exchange and other external commitments. Having a consistent rate of trade with one's trading partners is a priority for any economy. Despite embarking on devaluation to improve trade and economic performance, Nigeria was unable to achieve this goal. The government moved further by establishing the foreign exchange market (FEM), in balancing the switching scale based on the parity condition of installment, the rate of expansion, Domestic liquidity, and employment. A switching scale that is constantly changing has put the Nigerian economy to the test because of the failure to grasp this aim. The global exchange market can be seen as a channel or method of communication between sellers and buyers of distant trade in an effort to come to an amicable price agreement for the settling of international exchanges (App, O. M., 2019).



Afolabi said that in 2019, he defined conversion scale as the price of a particular amount of money relative to another. It is often the order at which one type of cash would exchange for another. During the Pre-Babangida organization years, the Nigerian currency was keeping up with the pound, at the same time over the dollar. However, since 1986, with the introduction of the structural adjustment program (SAP), the naira has depreciated in a somewhat incentive-like manner. The main objective has been to reduce the economy's dependence on the outside division and to have an appropriate and steady swapping scale that is consistent with the naira's internal rate. Before 1986, the Central Bank of Nigeria was one authority. The second-level outside trade advertise and the primary-level remote market were in September of 1986 separated at that point, making up the outside trade showcase (SFEM). The fundamental benefit of the SFEM was that it used aggressive offering to settle the costs of using foreign currencies instead of the naira, with the costs settling at focal points. When all readily available money had been exchanged, that was the extent of the offer. After the dollar rate was guaranteed, the exchange rate between the US dollar and the Nigerian naira was set, along with the exchange rates for other currencies. To wit: (Essien 1990:129). The national bank's plan to devalue the naira in order to blend the primary and secondary markets in as little as a year gained steam when SFEM was established. the exterior trade advertisements of both the first and second-level were combined in July 1987 to form what is now known as the remote trade showcase (FEM). The sharp depreciation of the naira was expected to be contained by the Dutch sale framework, which the central bank introduced on March 20th, 1987. This framework was designed to inject greater vigilance during offering sessions by requiring sellers to purchase at the minor rate if they offered above it.

A regular blending of the official market and the parallel market took place in 1994. Slowly but surely, the parallel market ate away at the legitimate market. The remote trade show was transformed in 1995 by the advent of the independent outside trade advertise (AFEM) for privately purchased items at market-determined trade pricing (2001 Annual Report of the Central Bank of Nigeria).

The management of the market mechanism and the parallel market fine-tuned the administrative process. However, the naira's devaluation was more pronounced. Additionally, a dual exchange rate regime that combined the market-determined and fine-tuned rates was introduced in 1995. By controlling the dual exchange rate

regime, the official selling rate for transactions under the culled priority regime was adjusted in 1997 to around N22 to US\$1. The nominal exchange rate stability achieved at the AFEM in 1995 and 1996 was frequently maintained in 1997.

### **Statement of problem**

In an effort of drawing attention to the problem of the exchange rate's fluctuation in the economy of Nigeria, some of the difficulties that serve to dampen the fluctuation of the exchange rate in the economy of Nigeria have been studied. Between 1975 and 1979, while the oil boom was at its height, the naira's exchange rate remained relatively stable. However, before 1990, when agricultural products made up more than 70% of the GDP, this was the case. However, due to progress in the petroleum oil sector in 1970, oil exports increased while agricultural exports decreased. The manufacturing sectors in Nigeria have increasingly become dependent on external sector imports of non-labor input due to the country's overall reliance on imports of capital and input commodities for the production process. Because of this, the indigenous content of the country has suffered greatly, as unused resources have been neglected as a result. The constant influx of foreign goods and materials has forced domestic producers to stop competing. It's also worth noting that, as importing has become so central to the economy, governments have begun to accept it as normal, so the impact of currency fluctuations hasn't been given the attention it deserves under previous administrations.

Foreign exchange rate fluctuations also create several problems for cross-border commerce. Goods exported from economies with an unfavorable exchange rate will give the importing country a price advantage, whereas imports from economies with a favorable exchange rate usually give the exporting country a price disadvantage. If the import costs of the exporting country start to exceed their export earnings, the country's overall balance of payments would suffer. However, if a country is serious about fostering economic development and progress, it must maintain a certain level of imports. Rate fluctuations, as Jhingan (2018) emphasized, create uncertainty and stymie international trade. Some small and medium-sized businesses are shut down because of the low Nigerian naira-to-dollar monetary unit exchange rate, and joblessness is a major issue because of the high cost of living. All of these vulnerabilities in trade dealings threaten a country's internal stability and

pose serious threats to its economic growth and development. With the goals of allocating external reserves, readjusting the exchange rate of Nigeria, improving the transparency of the market, and avoiding the capital flight from the state, the Nigerian government has taken several steps to help reduce the perpetual devaluation of the Nigerian naira. These steps include the introduction of the AFEM in 1999, the IFEM, and in 2002 of July- the merchandising System re-presentation. According to this concept, the Bank would mediate twice weekly, and final consumers would buy currency from vetted businesses at the prevailing bid prices. Up until the next auction, the rate at which the market was cleared (the marginal rate) was used to determine the price of the item being auctioned. The arbitrage premium between the official and black markets can be reduced by using the Merchandising System, although this discount is not inherited. Holders of conventional housing accounts were provided unrestricted access to their assets, while those with non-oil export housing accounts were permitted to use their funds for approved transactions as part of a variety of adopted steps to increase the exchange market operational productivity. The value of the Nigerian naira has continued to decline despite these efforts.

Since September 1986, the swapping scale of the naira has showed characteristics of gradual unsteadiness and debasement, when the Exchange rate system decided by the market was shown by ways for the second level distant trade advertising. This uncertainty, coupled with the naira's depreciation in the global currency market, has led to a general decline in living standards and a surge in the unexpected costs associated with production, all of which contribute to upward pressure on prices. In addition, it has weakened the global power of non-oil charges and made planning and forecasting difficult at both macro and micro levels. The low dollar/naira Exchange rate has killed off a fair number of small and medium-sized companies. This allows us to separate the varied problems that arise from various interest rates.

In light of the 1986 swapping scale improvement route to debasement, many questions have been made about the effects of techniques of the exchange rate on the economy of Nigeria. Several factors, including a freehand exchange progression arrangement, a weak generational base, an import-subordinate creation structure, an excessive reliance on the flawed market framework, a lack of fiscal approach, and

most importantly, a poor remote trade the board framework, have contributed to the sluggish Exchange rate framework.

### **Purpose of the study**

The constant rate at which the naira is being exchanged has become one of the most divisive problems faced by Nigeria, a nation whose economy is mostly dependent on imports.

To be honest, this is hardly shocking considering the substantial impact this issue has had on GDP (GDP). Here, however, GDP serves as a measure of a nation's economic health. The study's overarching goal is to accomplish the following;

One goal is to look at how a change in the scale used to convert currencies has affected Nigeria's economic growth.

To muse about the concept of the link between conversion scale variations and the progress of the Nigerian economy.

Third, we'll use what we learn to make some educated recommendations.

To determine whether or not the persistent variation in the Naira's swapping scale has an impact on the standard of living of Nigerians both at home and abroad, and if so, to what extent.

To investigate the hypothesis that fluctuations in the swapping scale have an effect on monetary growth in Nigeria, and to make policy about the structure of lending rates and the swapping scale in that country.

### **Significance of the study**

This study acknowledges the benefits and drawbacks of administration and exchange rate regulation and differentiates the economic variables most impacted by exchange rate instability, and brings foreign commerce and its monetary impact to the attention of the general public. Legislators and central bankers might use the results of these studies to design and implement a more efficient system of exchanging money. In a nutshell, this research will help with the following;

The findings of this research will be useful to policymakers tasked with setting exchange rates in order to propel the economy forward.

If the policies developed as a result of this research have a favorable impact on the economy in the short or long term, then the people will benefit as well.

Once again, there will be a direct benefit for the federal government, because they will be tasked with evaluating how the fluctuation in the exchange rate will affect the country's macroeconomic indicators.

Government will use the findings of this research to ascertain the impact of the fluctuating value of currency exchange rate on the demand for domestic goods in comparison to those of foreign countries.

This research will help future researchers because it will act as a benchmark for similar efforts.

### **Statement of hypothesis**

This investigation is predicated on two types of hypotheses;

**H0:** Null

**H1:** Alternative

**HO** is not significant, while **H1** is significant.

**H01:** Imports of Goods and Services do not affect the economic growth of Nigeria significantly.

**H11:** Imports of Goods and Services affect the economic growth of Nigeria significantly.

**H02:** Exports of Goods and Services do not affect the economic growth of Nigeria significantly.

**H12:** Exports of Goods and Services affect the economic growth of Nigeria significantly.

**H03:** Real Interest Rate does not significantly affect the economic growth of Nigeria.

**H13:** Real Interest Rate significantly affects the economic growth of Nigeria.

**H04:** Inflation, GDP Deflator (annual) does not significantly affect the Nigeria's economic growth.

**H14:** Inflation, GDP Deflator (annual) significantly affects the economic growth of Nigeria.

**H05:** Real Effective Exchange Rate Index does not affect the economic growth of Nigeria significantly.

**H15:** Real Effective Exchange Rate Index affects the economic growth of Nigeria significantly.

### **Limitations of the study**

During the course of this study, I was confronted with a number of barriers and constraints of various kinds. The data that was analyzed was gathered from secondary sources, such as the databases kept by the World Development Indicators and the Central Bank of Nigeria, amongst others. This is one of the problems with the study. Despite this, the research has a number of shortcomings and limitations, which could end up being a rich source of material for new ideas development for research in the distant or near future. It is probable that the result of this study, which was produced from a country-specific examination that was focused on Nigeria, is not applicable when applied to a more universal environment. This is because the examination that led to the discovery of the finding was conducted in Nigeria. In spite of this, it is feasible that the findings are typical of a wider spectrum of emerging economies and frontier economies than only Nigeria. As a consequence of this, it is possible that in the future, researchers may concentrate their efforts on examining the relationships between exchange rates, trade openness, and the economic performance of rising nations and frontier economies. Researchers may choose to conduct an analysis of these linkages in more than one country in order to ensure the dependability of their findings and increase the likelihood that their findings would be applicable in a global context. Writing errors and misspellings are also considered limitations in this study.

### **Definition of terms**

**Imports:** Products made in one country that are imported into another.

**Exports:** The production of commodities and provision of services in one nation that are then sold to customers in another nation.

**Real Interest Rate:** an interest rate that has been recalculated after taking into account the effects inflation.

**Inflation, GDP Deflator (annual):** measures the rate of price increase for domestically and internationally traded products and services produced in the United States.

**Real Effective Exchange Rate Index:** nominal effective exchange rate divided by a costs index or a price deflator.

**Exchange rate:** It refers to the price at which one currency can be purchased with another.

**Foreign exchange:** Involves the use of foreign financial assets from nations where such negotiations are legal.

**Autonomous Foreign Exchange showcase (AFEM):** A market where banks can go outside of the bank to conduct business and use market-determined rates for their transactions.

**Dual exchange rate:** This occurs when an economy has two different trade rates operating simultaneously.

**First-Tier Foreign Exchange Market (FFEM):** This is related to the fact that the government and its agencies buy foreign currency at a predetermined rate.

**Second-tier foreign-exchange market (SFEM):** In this situation, non-governmental organizations must purchase and transfer foreign trade at an Exchange rate determined by the market.

**Inter-Bank Foreign-Exchange Market (IFEM):** In this situation, the involvement of other players' models, oil companies, banks, and institutions non-bank financial in expanding the external trade showcase. Here, banks can advertise their own trade rates for remote trade to one another and to other clients. Cost of Current factor: Used as a barometer of the economy's overall health, GDP growth rates can be calculated with its help (GDP).

**Dutch Auction System (DAS):** A process for determining an exchange rate through auction, in which potential buyers and sellers each submit an offer, and the winning bidder receives the currency at the rate set by the highest bidder, plus a little premium.

## CHAPTER II

### LITERATURE REVIEW

#### **Theoretical Framework**

What we mean by "exchange rate" is the rate at which the currency of one nation is exchanged for that of another (Dornbusch, 2018). According to Mankiw (2017), it is the price at which exchanges between countries take place. An expert on Nigeria's monetary system is shown some of the problems that arise from not having an exchange rate that is stable and helpful and in line with other macroeconomic fundamentals. Because of the severe negative effects that fluctuating exchange rates may have on investments, prices, and international trade options. A real exchange rate is one that accurately reflects the volume and value of foreign commerce, the availability of goods, and the stability of payments relative to the cost and value levels of trading partners.

There are two primary schools of thought in the extant literature about the dissemination mechanism of the effect of conversion scale on monetary workouts. In accordance with the prevalent theory, the standard conversion scale operates via the total interest pathway. There is now a debate about whether or whether the collapse of the trading scale allows for a greater overall force of neighboring products, which would enhance the country's current record of equalization. The dissimilarity in the global strength of surrounding things enables an increase in fare, which in turn raises the level of interest in the economy. According to Edwards (1989), tradable exercises will be prevented due to a mismatch in conversion scale in the form of cash depreciation, hence decreasing the overall interest in the economy and net fare. He argues that true degradation causes undesirable effects, leading to a generalized reduction in the financial outflow. The following is a simplified explanation of the mechanisms by which compression occurs: First, an increase in the general value level will induce due to an apparent depreciation of money, resulting in low total interest. The result is a tightening of the currency. Improvements in exchange rate and the vulnerability of the economy are two fundamental factors that influence total exchanges. According to Akpokodje and Omojimite (2019), the shifting pattern of global trade, the evolution of economic institutions, and other accompanying shifts have all had an impact on these differences in Nigeria. Ogunleye (2019) afterward acknowledged that actual Exchange rate of Nigeria has been fundamentally affected by external shocks stemming from the concepts of global cost of oil and goods price,



both significant sources of the Nigerian remote trade income and fare; suggesting that when the economy relied on rural fares, genuine economy growth unpredictability was less noticeable because these things were prone to low volatility.

Inconsistency, as well as the fact that several other currencies were included in the calculation of the country's true conversion scale as part of the exchange process. According to him, this had a vanishingly little impact on the actual Exchange rate, which changed by just 0.14 percent from 1970 and 1977. Growing Nigeria's economic vulnerability to fluctuations in oil prices, which accounted for 10% of the naira's value between 1978 and 1985, as the country's oil dependence grew (Lama et al, 2018). Iyoha and Oriakhi (2020) argue that the changes in the real exchange rate during this time period were the result of fiscal deficits channeled through nominal stocks. Aliyu (2019) realized, via collaborative effort, that the oil bonus resulted in wasteful spending on strategically developed projects and the government's reliance on new currency generation to fund its spending once the fortune ran out. According to Lu and Zhang (2018), an inflation-weighting effect was applied to monetary growth, exacerbating already pronounced changes in real exchange rate dynamics.

Oyejide et al. (2019) establish the SAP's gathering as a role in reducing the components of genuine exchanging scale in Nigeria beginning in 1986. Drift in the apparent conversion standard technique was a major motivation for this approach. There were more significant increases in the conversion rate at this time because the Nigerian currency was permitted to float and the ostensible economic growth and development were gradually explained.

The average annual rate in the real switching scale in the country increased to 25% between 1986 and 1992, then decreased to 4.5% between 2000 and 2006, according to Alama et al. (2020). There has been a lessening in the outside exchange rate instability due to less strength financially, which is a powerful money-related strategy prompted by great terms of exchange, a progressively plain and free national bank, and generally overseen superficial economic growth.

Despite the fact that several hypotheses have been advanced about the link between differences in conversion scales and monetary advancement, four theoretical perspectives may be distinguished, are relevant to the questions we're asking. Each of

the four major hypotheses uncovered by our investigation is promptly addressed below;

### **Theory of Optimal Currency Area (OCA)**

This theory, first proposed by Mundell, is the most established and influential theoretical basis for exchange-scale organizations (1961) McKinnon, and (1963). The emphasis of this theory is on the evolution of the business cycle and international commerce. It is based on ideas of shock symmetry, responsiveness, and work-advertisement flexibility. Theoretically, a stable organization for the management of conversion rates would facilitate more trade and yield development by lowering the vulnerability of the conversion rate and, in turn, the cost of supporting it, and would also encourage more investment by decreasing the premium on funds obtained through financing. In any case, it can lessen trade and produce growth by halting, admitting, or directing the vital relative value modification procedure.

Current theories for conversion standards concentrate on financial and advantage market or portfolio balancing approaches to addressing parity of payments (BOP), he sees the magnitude of the exchanging market as a marvel of simple mathematics. In contrast, the focus of a traditional conversion scale theory is on streams and further the explanation of long-term scale switching evolution. The interest has shifted to exchanging scale guesses since fiscal streams have recently eclipsed exchange stream, although traditional hypotheses continue to be important in the long run (Salvatore, 2019).

Robert Mundell, a financial analyst from Canada, first proposed the idea of an optimum currency area (OCA) with stable wants in 1961. He demonstrated the elements necessary for a region to be considered a perfect money area and to benefit from a typical cash. If you flip a model on its head, you'll be shocked, but if you flip it right side up, you won't be.

When economic shocks inside the OCA threaten to destabilize a country's economy, a system with floating exchange rates is seen as more acceptable since it allows the affected country to absorb some of the shocks' negative effects locally.

Mundell proposes four (4) major characteristics for a good currency zone, and they are as follows:

Increased work mobility across the territory. Ease of doing good work may be defined as the lack of societal barriers to free development like rare languages or institutional ways like exchanging government privileges for others.

Flexibility and affordability of both capital and wages. With the ability to freely transfer funds between regions that only trade sometimes, overall trade can be bolstered, leading to greater economic growth. This lets interest and supply determine how money gets distributed, which is crucial for a healthy economy.

A money hazard sharing framework crosswise over nations. In a financial institution requires the distribution of funds to areas that are having financial difficulties, whether as a result of misappropriation of the first two characteristics or for any other reason. Fewer areas are being produced. The criteria are dubious because of the political difficulty of change in particular countries; while countries with surpluses are hesitant to give up their wealth holding all things constant, the failure of the European Economic and Monetary Union (EMU) to meet these objectives is demonstrated by the debt crisis that hit the region from 2009 and 2015, when an unusual EMU approach included a no-ransom clause that ultimately backfired to become increasingly obvious that this is not possible.

Similar cycles of business activity. The national bank of the OCA has the power to both disperse and balance financial subsidence where everyone within the zone is required to have identical economic cycles with the purpose that monetary explosions are distributed by promoting development and limiting expansion. Mundell went on to modify this ideal money area concept by mandating a nearer organization of worldwide hazard involvement in the zone, which he saw as not just important but crucial to the success of the OCA. In "Exceptional Arguments for Common Currencies," published in 1973, Mundell argues that surplus countries should "saving pool" or share their wealth in order to protect themselves from the effects of market shocks. Therefore, a skimmed swapping scale that primarily considers the impact on the home country's economy is not an acceptable criterion for an OCA. Subsidence and devaluation cannot be concentrated on a single nation or region since money is pooled and the district's economy would benefit from a widespread monetary shock.

### **Purchasing Power Parity**

Costs and relative exchange rates are linked, as shown by the Purchasing Power Parity (PPP) hypothesis. Though the Salamanca School can be traced to the roots of the PPP concept back to the sixteenth century, its modern application on of PPP theory of assurance exchanging scale originated with the work of Gustav Cassel (2018), who proposed PPP as a method for exchanging pre-existing scale confidence. When fighting in World War I finally ended, countries' trade rate parities began a process to revert to a higher quality level system. In 1914, it was necessary to make certain modifications since countries that dropped below the highest quality level saw wildly different economic growth rates during and after the war. The most straightforward and persuasive type of PPP (such as outright PPP) depends on a general multi-extraordinary arrival of the principle of one cost, which is the basis for the assurance of conversion scale. According to pure PPP, the value of a country's currency should shift such that it is similar to another's based on the prices of a country's national supply of goods and ventures.

Exchange rates based on purchasing power parity are useful for pricing, but they ignore the fact that goods from different countries have different qualities and hence fail to account for such differences. For instance, suppose that in two different years, the amount of a given commodity manufactured in a given country is the same as in the other. One country's GDP measured in its own currency may appear to have a higher real GDP than another country's GDP measured in its own currency in some years and a lower real GDP than the second country in other years, but both inductions would fail to express the conviction based on their respective generation's overall dimensions when using market exchange rates. However, the false induction does not occur when converting one nation's GDP into the other's currency using the Purchasing Power Parity of product trade rates rather than monitored trade rates. Gross Domestic Product Purchasing Power Parity is a method of measuring a country's economic output that adjusts for differences in the cost of living and the value of currency, typically in relation to the US dollar.

### **The Monetary Model of Exchange Rates**

The theory postulates that bilateral rates of trade are set during a process in which each country's stock or overall interest and supply of cash are adjusted. The theoretical interest on cash is stable over the long run and has a positive correlation

with the magnitude of the theoretical national revenue but a negative correlation with financing cost, based on the fiscal technique. The money supply of a country is proportional to the monetary base multiplied by a growth rate. The financial expertise of a country's monetary base might be compared to the household credit they have amassed. When domestic demand is low, a country's surplus of cash leads to a rise in the shortfall equalization of installment under settled trade rates, while under the movable conversion standard, the surplus of cash leads to a fall in the money of the country (shortfall equalization of installment). The country, contrary to common assumption, offers a plethora of investment possibilities.

### **The Portfolio Balance Approach**

The benefit showcase approach also called the portfolio balance approach, varies from the fiscal methodology in that it assumes that domestic and foreign securities are imperfect substitutes and that the swapping scale is established when the total supply and interest of monetary resources (of which cash is just one) in each country is adjusted. This means the portfolio balance method is a more reasonable and popular way to understand the economy. Those who subscribe to the portfolio balancing model divide their wealth between local currency, a local bond, and an external bond denoted in foreign currency.

#### The Portfolio Balance Approach Assumptions

The portfolio balance approach is predicated on a variety of assumptions, the most important of which are as follows:

The Purchasing Power Parity (PPP) model fails to account for reality.

No perfect alternative for Bonds.

The uncovered interest parity does not hold.

It assumes excellent capital mobility in the absence of capital comparable and controls investment barriers.

It is predicated on the fact that there is a high completion rate inside the money markets and that there are cheap transaction costs.

Foreign bonds, domestic bonds, and money are the three (3) assets available for investing to every single family.

The exchange rate is expected to remain constant.

### Vital Points of Portfolio Balance Approach

Provides a more straightforward and realistic structure.

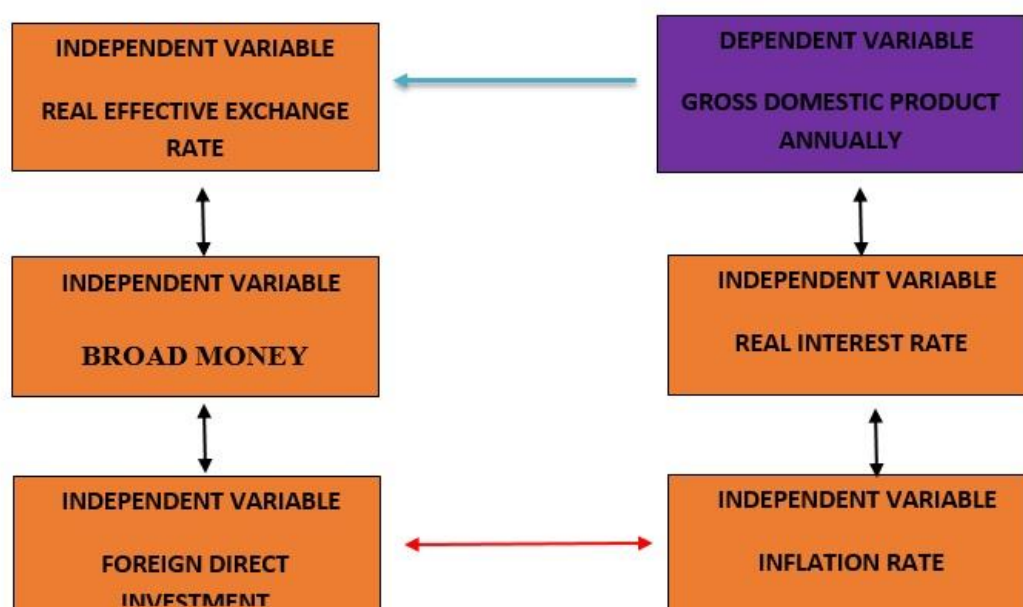
This strategy has not demonstrated any evidence of being able to accurately estimate exchange rates, based on empirical confirmation.

The significance of international financial markets is emphasized (bond markets in particular).

The theory presupposes the existence of arbitrage between two economies.

### Conceptual Model

Figure 1.1



### Conceptual Framework

#### An Overview of Naira Exchange Rate Management

The naira switching rate was established before the Structural Adjustment Program (SAP) presentation in 1986. As a global component of the conversion scale, the administrators working alongside the framework of Bretton Woods initially set it to the British pound sterling, and subsequently, they changed it to the United States dollar. The approach for determining the switching scale of the Nigerian currency has been characterized by its persistence when the major monetary forms, the dollar and sterling, began to weaken dramatically around 1973. Since 1986, when one

dollar was for 3.75 naira, the value of the currency has fluctuated wildly; today, one dollar buys N360. This is mostly attributable to the frequent replacement of ineffective political leaders.

Exchange Rate organization of Nigeria has been a concern since the country gained its independence in 1960, despite the fact that the Federal Ministry of Finance and the Nigerian Central Bank both came into existence two years earlier (Ogiogio, 2019). The years 1960–1985 (the "pre-Structural Adjustment Era") and the years 1986–present (the "post-Structural Adjustment Era") can be used as dividing lines for the history of management conversion scales. Due to the aforementioned congruent depictions, a permanent record of somewhere in the vicinity of five stages, to be precise:

**Phase 1:** Fixed exchange rate between the British pound and Nigerian pound the (1960–1977): The Nigerian pound (N£) used to be equal to one British pound sterling (B£), but this ended with the pound's devaluation in 1967.

**Phase 2:** The US dollar was pegged to the Nigerian pound from 1967 to 1974. After abandoning the American dollar and re-keeping its currency at standard with the British Pound in the wake of the International Monetary Crisis that caused U.S. President Richard Milhous Nixon to degrade the dollar in the mid-1970s, Nigeria's exchange rate with the pound remained constant. During this stage of Nigeria's exchange rate procedure, it has become abundantly evident that the naira's peg to a single currency contributed to its abandonment.

**Phase 3:** Independent policy on the exchange rate from 1974 to 1976: In 1974–1976, the Central Bank of Nigeria (CBN) abandoned its naira-to-US-dollar peg policy in favor of a more flexible approach to exchange rate management, pegging the naira to the stronger of the US dollar and the British pound information released to the public from an external exchange (see Ogiogio, 2019).

**Phase 4:** Gliding the naira to a basket of currencies based on imports (1976-1985): Here, an attempt at an import-weighted holder was made between the years 1976 and 1985. The Swiss Franc (SWF), German mark (DM), French Franc (CFA), the British Pound Sterling (GBP), the Dutch Guilder (DKK), The United States Dollar (USD), and the Japanese Yen form part of a set of financial gauges that ensures the naira's tenacity and common sense. This was done on purpose due to the oil effect of the mid-1970s (JPY). The Federal Government of Nigeria was left with two options: either continue with the overvalued naira due to the settled conversion scale or take

control of the IMF–World Bank, a structural adjustment program that was imported and worshipped market forces (the free will of supply and demand). During the middle of the IBB program in September 1986, the Federal Government of Nigeria (FGN) displayed the Second-Level Foreign Exchange Market (SFEM), which was later called the Outside Exchange Feature (FEM).

**Phase 5:** Exchange rates are set by the market (1986 to the present): The post-Structural Adjustment Program era in Nigeria marked the beginning of the existing fifth exchange rate regime. On September 26, 1986, the first market, SFEM, opened with immediate effects. In 1995 and 1999, The forex market in Nigeria was revolutionized with the introduction of the Interbank Foreign Exchange Market (IFEM) and the Autonomous Foreign Exchange Market (AFEM). On October 25, 1999, the AFEM transitioned to the IFEM, a two-way quote system. CBN has been using the Dutch Auction System (DAS) instead of IFEM since July 16, 2002.

### **Exchange Rates Policy**

Policymakers can take advantage of the correlation between an economy's trading volume and total interest by manipulating the cost of transportation and imports. The manipulation of exchange rates for the purpose of altering the global monetary and fiscal situation is a form of cash connected approach. Rate adjustments in transactions run their course at first.

Entering a country by means for their impact on prices to see how they fare A product that sells for £10 in the United Kingdom but only \$13 in New York due to the rate of exchange between the two countries' currencies. The price of the British product in New York will increase to \$16 if the conversion standard is eventually adopted, making £1 equal to \$1.60.

This is encouraging news for British exporters, given the rise in USD salary is consistent with the expectation that there is a price inelastic demand in New York. Regardless of whether or not there is slack in the demand in New York, the effect of the valuation of the pound will be detrimental to the exporters in the United Kingdom. For instance, if the United Kingdom were to increase the amount of stock it imported from the United States, the increasing swapping scale would suggest that the value of the pound needs to go up by ten dollars in order to reflect this change.



Currently, in London, the price of US items has dropped from £6.67p to £6.25p, making it cheaper. As the price of imported raw materials or finished goods drops, traders benefit to some extent from the strength of the pound.

As a result, import and transportation prices will be affected in tandem whenever the conversion scale is adjusted. There will be repercussions in the form of a shift in import spending and fare pay as a result of fluctuations in the two variables' respective prices.

How exchange rate manipulation occurs: Exchange rates can be managed through the purchase or exchange of external trade showcase monetary forms. The Bank of England sells pounds to lower its value and purchases pounds to boost the value of the pound. Another tool for manipulating interest rates is the cost of financing that currency transactions entail. Finance costs affect the demand and supply of Sterling through mechanisms connected to the circulation of hot money. When currency exchange rates fluctuate, it is commonly seen as a form of monetary agreement.

**Exchange rate impact:** Recognizing the existence of a yield gap, knowing that a reduction in the switching scale will lessen shipping costs, and presuming demand is malleable, increases in monetary gain from commerce are expected. The same way that a decline in the exchange rate drives up import prices, a rise in the cost of the interest needed to borrow money to finance those purchases will cause import spending to decrease. In tandem, this raises both the overall interest and the UK payment parity.

**Cost-driven inflation:** The price of imported raw materials increases production costs and causes cost-push inflation, which is why a reduction in the conversion scale is inflationary.

**Exchange rate flexibility:** A country can pick its long-run rate of inflation and, as articulated, flexibility in exchange rates liberates financial policy once capital skillfulness is strong, gone for the sake of household adjustment, Dornbusch, et al. (2019). In addition, a flexible exchange rate would make it easier for policymakers to react to external shocks by automatically adjusting the domestic economy in reaction to shifts in the balance of payments. The economy responds to shifts in cash aggregates, as Dornbusch and Giovannini (2019) have argued.

A flexible exchange administration would ease the restrictions on approach mechanisms in flexible exchange rate regimes, outside from monetary policy. Authorities' ability to affect domestic economic conditions will be constrained by charge per unit fixity since it shifts the bulk of the amendment process to the actual economy. Therefore, all else being equal, it is reasonable to anticipate development instability as a reaction to a method of charging a fixed amount per unit in relation to a framework of variable exchange rates.

To stabilize the Naira's exchange rate, improve the country's export sector, ensure the economy's vigor, and prevent further overvaluation, according to Obaseki and Bello (2019), a flexible exchange rate system was developed. The overall goal of the shift from a fixed to flexible regime was to maintain a stable external balance, or macroeconomic stability and stimulate growth.

In light of the recent financial crisis, Breger et al. (2020) argue that many countries are switching from one conversion scale routine to the next (typically from a rigid to a more flexible one), reigniting the age-old debate on the swapping scale routines decisions and determinants as a means of coping with economic instability. Over the course of the last few years, business analysts have proposed varying interpretations of what constitutes an appropriate trading pattern for a nation's economy.

### **The Fixed Exchange-Rate Policy**

However, in businesses using settled conversion scales, the focus of cash-related methods will shift away from external parity and toward internal stability. Also, due to the rapid mobility of capital and the perfect substitutability of local and foreign assets, the financial strategy ends up being wholly devoted to the swapping scale equality impediment. Once the seeming transformation standard is established solidly, uniformity in advance charges will reliably foretell that the costs of financing for both close relatives and faraway acquaintances will be fair, after accounting for the effects of risk premiums and the price of goods traded. A decrease in the cost of private financing and an increase in the influx of capital will result from the generation of additional money. Therefore, whenever a fixed exchange rate is in place and is a highly flexible capital, a small country's budgeting approach becomes ineffective in mitigating the economy (Obstfeld, 2019).

First, according to Eichengreen (1998), when the conversion standard is defined, it implies three crucial measurements, including the imports of monetary aggravations

occurring in the base country by the family country, regardless of whether or not devaluation is complete. Financial arrangements that are subject to the swapping scale are another necessity of the settling conversion scale.

strategy exiting a room whose success is contingent on the size of the external trade reserves available to financial experts. It's possible to tighten up on how you approach money.

Finally, the third point of emphasis—the compromise that was reached between the development ace of the previous withdraw work and the revolt of the swapping scale equity—may make the difficulties of fixed rates unappealing to two or three countries at some point in time. Without suitable compensation, scheduled change loss and the reduction in financial arrangement self-sufficiency in highly coordinated capital markets would likely enhance development instability in an insufficiently adaptive economy underpinned by fixed trade rates (Goldstein, 2018).

### **Exchange rate volatility concept**

Money-related streams and monetary markets interacting have implications that have been beautifully outlined by Mundell (1968). He demonstrated that, under fixed exchange rates, monetary policy becomes obligatory and, at times, inefficient as a result of rising capital mobility. Cash supply is endogenous; therefore, it changes as the economy does. According to this, a protracted economy's malleability and resistance to disruptions' enhancements.

According to research by Eichengreen and Hausmann (2019) and Kamil (2018), developing countries may be able to reduce their external exposure if they are prevented from making purchases on foreign currency markets. Long-term loans, whether domestic or international, must be settled in foreign currency. Thus, from the outside separate from one another are the introduction and scale-swapping procedures. some swapping scale risk may be created from a more flexible conversion standard, prompting financial operators to "fence" their investments in remote currencies if the major reasons for external presentation are not the external acquisition of remote currency. As a result, local businesses and institutions are less vulnerable to the effects of currency exchange rate fluctuations and disruptions in global financial markets. Apart from the obvious risks associated with external introduction, established trading practices are frequently the target of theoretical assaults.

Although skims in industrialized countries have been outperformed by middle-of-the-road established routines, Yeyati and Sturzenegger (2020) found that this was not the case for developing countries, where conversion standard adaptability reduced development uncertainty. Recounting the Swedish GDP growth from 1974 to 1994, Bergwal (2020) found ideas on a wide range of conversion factors, he came to the conclusion that the gross domestic product would have been somewhat more stable if flexible trade rates had been implemented rather than a true customized peg, which would have inevitably mandated a pegged conversion standard.

### **Exchange Rate Regime Determinants**

Observational discoveries on the factors of shifting scale methods are diverse and debatable, as predicted by Meon et al. (2020) investigation. Disparities in findings can be traced back to factors including the specific countries studied, the length of time covered, and the types of standardizations applied to the data approaches to estimate and doubts about econometric models.

Gosh et al. (2019) question why certain countries respond to fixed exchange rate frameworks, which, as noted, will limit economic growth if a flexible exchange rate strategy will reduce growth uncertainty credibility in currency rates, fiscal and monetary methods, and outstanding self-governance are sometimes used to justify a firm stance on exchange rate administration. When a country's currency rate is pegged to another's, the "base" country gains access to the sound monetary policy at no cost. This increase in credibility will facilitate the fiscal needs of the operator and increase the effectiveness of the financial plan, so facilitating the dampening of economic cycles. Gosh, et al., (2019) settled exchange rates contribute to a domestic monetary state that is favorable to speculation and exchange, which in turn encourages moderately supported and stable economic growth. As a result, the risks associated with the degenerate financial and monetary systems seen in many developing nations, such as Latin America in the 1980s, are mitigated by fixed exchange rate governments.

Countries with more flexible exchange rate regimes adapt faster to exchange rate shocks than those with more rigid frameworks, Edwards and Levy Yeyati (2018) found evidence.

In their 2018 study, Broda and Tille categorize 75 developing countries throughout a time frame that's nearly identical. According to their findings, the real GDP growth inconstancy in countries with established trade rates is 21.3% temporary and 30% long-term. These pledges drop to 2.4% and 9.6% respectively in countries with flexible exchange rates rigidity of ostensible trade rates in both established and developing economies increases the impact of terms of exchange shocks on development instability (Edwards and Levy Yeyati, 2018).

### **Exchange rate fluctuations and central bank intervention**

Intermediation's potential utility can be assessed by thinking of the swapping scale as an advantage cost. From this vantage point, the present conversion scale is reliant on the current and expected future nuts and bolts. In addition, some studies have shown the vulnerability of conversion standard developments to non-principal elements like group behavior, data falls, and hypothesis testing, at least in the near run (Frankel and Froot, 2019; Allen and Taylor, 2019).

If mediation has an effect on the here-and-now fundamentals or on assumptions about the hereafter nuts and bolts, then it may have an effect on the spot conversion standard.

Whether or not the rates of trade can be influenced independently of the financial policy determines whether or not intervention is useful with regards to oversaw coasting routines position because mediation is a situation-specific arrangement instrument. As a result, most of the focus in the literature has centered on the question of Cleanse interventions (those not backed by shifts in monetary strategy, for instance) are just as effective as their less purified counterparts, if not more so. Standard course reading refinement between sterilized and unsterilized intervention is based on the impact on base cash (a quantity measure), but ultimately, the crucial criterion is whether or not the costs of loan are affected. Since demand and supply of base cash fluctuates virtually daily due to self-governing variables, it is not always necessary for the full amount of mediation to be counterbalanced within the domestic currency market in order to keep up transient lending fees.

Because normal intermediation trades are so little in comparison to the weight of extraordinary resources, one might not expect the effects to be particularly strong in modern nations through the portfolio balance channel. Similarly, there will be

substantial cross-market substitution between domestic and international money securities (Dominguez and Frankel, 2019).

### **Fluctuations and Exchange Rate Regimes**

There will be a strong emphasis on both the standardized methods for converting sizes and the more flexible routines for shifting scales. Reasons for choosing flexible exchange rates include the increased freedom in monetary arrangement that comes with greater capital mobility. Dornbusch et al. (2019) argue that allowing for some degree of fluctuation in interest rates allows countries to determine their own sustainable growth rates and frees up financial resources that can be put toward urban renewal. The capability to adjust conversion standards would also speed up the response of strategy to external shocks by setting in motion a predetermined shift in the regional economy in response to shifts in the relative importance of investment.

According to established conversion scale routines, on the flip side, the monetary organization will be used, partially or whole, to pursue foreign parity. As a result of the great mobility of capital and the perfect substitutability of both internal and external resources (Obstfeld, 2019), it becomes clear that the primary goal of any financial arrangement must be the maintenance of exchanging scale equality. In practice, after the de facto conversion standard has been conclusively established, loan cost parity will anticipate the equivalence of financing costs for homes in urban and rural areas, after adjusting for hazard premium and currency conversion rates. In the same way that a decrease in home mortgage rates and a rise in capital creation result from each new source of cash, so too does each new source of cash.

Monetary policy in a small country is counterproductive when capital flows freely and the exchange rate is stable. Hidden rigidities and international capital mobility show what the real effects of monetary arrangements are (Dornbusch and Giovanni, 2019). When nominal wages and prices remain stable, but the money supply shifts, real income and spending patterns respond in kind. As the swapping scale rises, it is typically accompanied by a corresponding rise in capital developments that are triggered by shifts in financing costs to strengthen the monetary policy impacts on the economy (Mundell, 2019).

Dornbusch and Giovanni (2019) argue that economies can adjust to fluctuating cash flows by using flexible conversion scale algorithms. Additionally, to

a fiscal strategy, a flexible trade routine would lessen the constraints of available strategy instruments.

Conversion standard fixity on financial and monetary methods may impede experts' ability to affect domestic financial conditions, which is where the bulk of the change process is really implemented. Under such conditions, one would anticipate a higher degree of uncertainty in the course of events, all else being an equal build-up of finalized exchange rates with regard to a flexible conversion standard strategy.

However, a few caveats should be mentioned. Interests inferred from fluctuations in exchange rates can be mitigated by adjusting the monetary framework, such as by increasing the emphasis on methodology. If the government is unable to pursue dependable methods, the flexibility of trade rates and the resulting caution in strategy-making will undermine development reliability. As highlighted by Calvo and Reinhart (2020) the benefits of a flexible conversion scale procedure will be diminished or disrupted in most cases due to the fear of gliding and the strong exposure of exchanging scale advancements to household expenses in small nations. To ensure the success of the monetary strategy, careful planning and coordination of financial strategies (in particular, financial and money-related arrangements) are essential.

## **Empirical Review**

### **Exchange rate and economic growth empirical literature**

Previous research on how fluctuations in the conversion scale affect monetary growth has shown conflicting findings. For instance, contradictory evidence demonstrates that a change in the actual exchanging scales will affect growth outcomes. An outlandish school of thought holds that the size of a country's trading sector has no bearing on its level of economic development.

While the aggressiveness theory suggests that a scale conversion will have a negative effect on productivity and development in the short term, the use of the quality Least squares system by Harris's (2018) revealed that once befittingly overseen development and impact effectiveness in both the short and the long term, by the exchange conversion scale. Aghin et al. (2017) conducted an analysis and found that the impact of instability of the conversion scale, or the effect of how well the economy is supervised on real activity, is irrelevant and negligible. This is consistent with Dubas and Lee (2017) findings, who independently established a

robust connection between the reliability of conversion scales and progress. That the development rates of (Southern) Eastern and Central European countries would be affected by their membership in the European Financial Union is substantiated by the data presented. The value structures of two economies can be helped by using a common conversion scale, as Hossain (2020) acknowledged. This has implications for the volume of imports and exports, as well as the national level of equalization of prices the place of installments.

No reasonably robust changes appear in results to be in country inclusion, methodology, or test period when previous studies are analyzed a standardized procedure for making estimates and performing conversions. In contrast to the findings of Von Hagen and Zhou (2017), who found a negative association between the size of the economy and practical gliding routines, Rizzo (2019) found a positive relationship between the two. Four studies strongly found a correlation between GDP growth and routine change (Edwards, 2019), while a strong correlation between GDP growth and stable routines have been found by three studies (Rizzo, 2018), and two studies find no correlation at all (Poirson, 2018).

Using seasonal data from 1980 to 2010, Adeniran (2017) analyzed the effects of conversion standard variance on Nigeria's monetary growth. According to the findings of the study, which were arrived at through the application of an Ordinary Least Squares (OLS) method, the conversion scale has a beneficial impact on the expansion of the Nigerian economy. Using annual data from 1980-2010, Asher (2018) analyzed the effect of scale variance in currency exchange on Nigeria's economic growth. Using the Ordinary Least Squares (OLS) method, we discovered that the conversion standard significantly influenced the Gross Residential Item. Given Fapetu 2013's analysis of annual data from 1960–2012, which reveals a correlation between online commerce and Nigeria's economic growth, it's clear that this factor is crucial. Results from an Ordinary Least Squares (OLS) analysis found that the conversion standard accounted for about 99% of the variation in monetary growth.

Using annual data from 1986 to 2010, Nigeria's monetary development was analyzed in Sunday's (2017) study of the effects of conversion standard development. The results of a study employing the General Minimum Squares approach showed a strong correlation between the adoption of a unified standard for currency conversion and the growth of the Nigerian economy.



Kamin (2011) looked into what brought about shifts in the foreign exchange rate and how that affected how the Nigerian economy functioned. They used supplemental data gleaned from CBN's repository. The time arrangement data was analyzed and regulated into an Econometric Model of Development using the Ordinary Least Square approach for multiple relapse investigations. The data leaks suggest that growth has had negative effects on the Nigerian economy.

According to research by Rano-Aliyu (2019) conducted in Nigeria, the valuation for the switching scale practice has a significant impact on consumers' actual spending power growth in Nigeria. Since the Nigerian economy inherently lacks the ability to correct increases through aggression, the energy around the standard of exchange conversion will make up for lost intensity quickly. Since gratitude increases home investment and investment funds and improves the quality of life, it follows that these factors will contribute to economic growth.

Valuation for exchanging scale results in diluted imports and reduced fares, as shown by Aliyu (2019), whereas deterioration would increase send and weaken import. Similar to how a decline in conversion standard would inevitably result in a new remote merchandising unit product, the opposite is also true. The growth of money is inextricably linked to the scale at which it is converted. From 1970 to 2003, Akpan (2018) examines Nigeria's booming oil-based economy and its impact on the country's trade and currency. He discovered the link between the rate of currency conversion and economic growth. In a similar vein, the link between conversion standard and Nigeria's economic growth from 1970 to 2010, was investigated by Obansa et al. (2018). The findings pointed to the importance of switching volume in determining Nigeria's economic growth. They determined that a rise in the conversion scale was positively impacting the Nigerian economy improvement.

Azeez et al. (2018), in their analysis of the effect of the fluctuation of the conversion scale on Nigeria's macroeconomic performance from 1986 to 2010, found a strong correlation between the exchange rate and GDP (GDP).

Using a mistake correction display, Adebisi and Dauda (2019) argued that, contrary to expectations, the development of trade was accelerated.

From 1970 to 2006, a Nigerian mechanical component helped maintain equilibrium in the showcasing of traded goods. From their perspective, there was a strong positive correlation between authentic food and the number of machines used to produce it. The total amount of manufactured goods grows by 12.2 percent for

every one percent increase in genuine fare. Reasoning suggests that deregulation's method affected fares significantly through scale trading. However, previous research has also found that trade velocity does not significantly affect the efficiency with which economic growth is accomplished.

Bosworth, Collins, and Yuchin (2019), for instance, presented evidence that in a sizable sample of industrial and developing nations, actual conversion standard unpredictability

inhibit economic growth, lowering efficiency and slowing progress. Problems with Structural Adjustment Implementation, as outlined by Ubok-udom (2019).

After investigating SAP's efficacy in Nigeria, they found that the country's particular economic landscape makes it difficult to create compelling results through cash deterioration. They explained the rise in household production as a direct capacity of the varieties in regular ostensible switching scale. This explanation is based on a study into the relationship between conversion standard variety and local yield development in Nigeria between 1971 and 1995. The study was conducted between 1971 and 1995. To determine when currency would depreciate, he probably employed fictitious elements. The results showed that all statistically significant coefficients of the basic logic components were negative.

Scale swapping's effects on Nigeria's industrial sector were also studied by Umeh, David, and Ameh (2010). Using several different relapse econometric tools, they discovered a negative correlation between grouping division performance and conversion conventional unpredictability. This research is motivated by the ambiguity or uncertainty of the results, as well as the emphasis on the effect of conversion scale vacillation on monetary development that is displayed in many government programs in Nigeria.

### **Broad money and economic growth empirical literature**

Ewinetu Tegegne (2021) investigates the influence of the money supply on Ethiopia's real GDP. This analysis relied on serious data from the annual report of the National Bank of Ethiopia (2002-2017). We used a vector autoregressive model and a causality test to examine the relationship between broad money supply and real GDP growth in Ethiopia. According to the results of both analyses, the overall money supply has a significant effect on real GDP and positive, with a 5% level of statistical significance. Johansen cointegration test results, however, show that a

greater money supply is not associated with actual GDP over the long term. The policy consequence was that monetary authorities may expect a sizable positive impact on real GDP from any short-run change in the country's broad money supply level.

Using time series data from 1980-2016, Dingela and Khobai (2017) investigated the dynamic impact of broad money supply (m3) on GDP per capita expansion in South Africa. This study used the error correction model to assess the effect of m3 on GDP per capita and an ARDL-bounds testing method for cointegration. Gross domestic product per capita, inflation rate, interest rate (INT), and broad money supply (M3) are the four macroeconomic variables included in the model (INF). The findings indicate a statistically significant positive relationship between the money supply and economic growth over the medium to long term. The government of South Africa needs to be reliable and consistent, so that the country's money supply can grow at a steady rate in step with economic growth (as dictated by "the Taylor rule"). The South African Reserve Bank might benefit from such a rule since it would help cut down on the wasteful use of discretionary policy. The relationship between monetary policy, inflation, and interest rate changes in Nigeria was studied by Abdulgafar and Olarinde (2017) using time series data from 1973 to 2013. We employed the VAR model and the Granger causality test within the scope of error correction. The results of the VEC model demonstrate that an increase in money supply encourages growth, but an increase in interest rates or inflation slows it, particularly in the long run. A high money supply and low interest rates have been shown to have a negative effect on economic growth, as has inflation, according to short-term statistical analysis. Changes in the money supply, inflation, or interest rates do not cause or contribute to GDP growth, as shown by the granger causality test. In order to reduce the impact of inflation on the economy, the study recommended an expansionary monetary policy and interest-free financing to boost investment in the real sector. With data from the Nigerian Central Bank from 1987 to 2010, Patricia and Izuchukwu (2016) used an ordinary least squares (OLS) analysis to look at the correlation between Nigeria's money supply and GDP growth. Additional quantitative analyses, including the unit root Augmented Dickey Fuller (ADF) test, the KPSS, the VAR Granger causality test, and co-integration, confirmed a significant and positive relationship between Nigeria's money supply and economic growth. This is due to the fact that M2 has an abnormally large impact on production and inflation.

### **Foreign direct investment and economic growth empirical literature**

Khaliq and Noy (2007) use a significant amount of data on FDI inflows into Indonesia from 1997 to 2006, spanning a wide range of industries, to examine the impact of FDI on economic growth. There is evidence that FDI helps the economy grow as a whole. The positive impact of FDI is mitigated, however, by disparities in average growth performance across industries. Several industries indicate a favorable impact of FDI inflows, whereas one area shows a large negative impact, indicating that the composition of FDI matters for its influence on economic development. Among the industries benefiting from foreign direct investment is the IT industry (mining and quarrying). Some of the industries examined include agriculture, cattle, forestry, fishing, mining, and quarrying. The private and service sectors such as construction, real estate, wholesale and retail commerce, hotel, transportation, and communications are also flourishing.

Foreign direct investment (FDI) was a major factor in Akinlo's (2004) analysis of Nigeria's economic growth from 1970 to 2001. Private money and lagging foreign capital contribute virtually little to economic growth, according to the ECM. These findings appear to lend credence to the argument that extractive FDI may not be as expansionary as industrial FDI. Furthermore, exports are revealed to have a positive and statistically significant effect on growth. One measure of financial progress is the money supply to gross domestic product ratio, and this ratio has been found to have a highly negative impact on economic expansion. In conclusion, the results demonstrate the favorable impact of the labor force and human capital on progress. Based on these results, it is clear that a plan is required to increase the labor force and enhance education in order to increase the human capital of the country.

Economic growth and Foreign direct investment (FDI) in Nigeria are two questions that Abdu (2003) attempts to answer by looking into whether or not Nigeria benefits from FDI. The research relied on secondary data that was analyzed with Minitab Student Edition. The results showed a significant correlation between FDI and GDP growth, suggesting that FDI is a driving force behind economic expansion. The balance of payments and foreign trade are negative, while the exchange rate, exports, and external reserves are all positive for economic growth. In order to attract more foreign investment, Nigeria needed to strengthen its macroeconomic policies and increase security.

Adegbite and Ayadi (2010) study the link between Nigerian economic development and FDI inflow. The research became required because, for the first time, civilian administrations have used a variety of measures to enhance the flow of FDI into Nigeria because of its anticipated advantages, which are extolled in the theoretical literature as a cure for economic underdevelopment. To achieve the best linear unbiased estimators, the research used basic OLS regression analysis and several econometric tests on our model. The research proved FDI's favorable influence on growth. However, the impact of FDI on growth may be constrained by human capital. The research determined that FDI does actually stimulate economic growth, and hence the necessity for additional infrastructure development as well as providing a healthy macroeconomic environment and human capital development is critical to increasing FDI productivity and flow into the nation.

#### Inflation and economic growth empirical literature

Barro (2013) examines the effects of inflation on GDP. Based on regression analysis, it appears that a 10% annual increase in average inflation slows real per capita GDP growth by 0.2-0.3 percentage points annually and the ratio of investment to GDP by 0.4-0.6 percentage points annually, providing a number of economic variables remain constant. Since the statistical approaches use plausible inflationary instruments, we can deduce that the correlations represent the causal effects of inflation on growth and investment. When high inflation events are included in the sample, only then do the results become statistically significant. While the impact of inflation on growth in the short term may appear inconsequential, it can have a significant and lasting impact on people's standard of living. Real GDP is predicted to fall by 4-7% after 30 years as a result of an increase in the inflation rate of 10 percentage points per year brought about by a shift in monetary policy.

Gokal and Hanif (2004) looked at a wide range of economic theories and discovered consensus on the inflation-growth connection. Supply-side views, which are reminiscent of classical economics, argue that saving and investment incentives are necessary for economic growth. It was Keynesian theory that produced the more comprehensive AD-AS framework for correlating inflation with economic expansion. Inflation's effects on investment and capital accumulation were studied by neoclassical economics and endogenous growth theorists, while monetarism focused on the function of monetary growth in causing inflation. In addition, the most current empirical papers on the topic are reviewed. Just a few examples of relevant studies

are those conducted by Sarel (1996), Andres and Hernando (1997), Ghosh and Phillips (1998), and Khan and Senhadji (2000). (2001). Finally, we checked to see if a similar relationship existed in Fiji. The experiments revealed that inflation has a weak negative link with growth, but that changes in the output gap had a far more significant impact. The correlation between GDP growth and price increases was unidirectional.

### **Interest rate and economic growth empirical literature**

Udoka (2012) looks into how changes in interest rates have affected Nigeria's economy. Two research hypotheses were formulated to investigate the time period before and after interest rate deregulation in Nigeria, as well as the correlation between interest rates and economic growth. Ex-post facto methodology was employed to compile the data for this investigation. The statistics bulletin published by the Central Bank of Nigeria served as the study's data source. The gathered data was reviewed and evaluated using the traditional least-squares multiple regression analytical approach. According to the findings of the research, there was a correlation in the opposite direction between economic growth and interest rates in Nigeria. This indicates that an increase in interest rates results in a decrease in GDP and, as a consequence, a slower growth rate in the real sector. It was suggested that Nigeria carry out an aggressive monetary strategy that would boost the amount of loans to the real sector economy in order to stimulate productive economic activity. The impact of interest rates on economic expansion was studied by Mutinda (2012). Therefore, this study's goal is to fill an informational void. The study set out to answer the question, "How have lending interest rates affected economic growth in Kenya?" and to do so by analyzing the available empirical information. In order to answer the research question, I used quarterly regressed data that I got from the KNBS and the Central Bank of Kenya for the period of 2003 to 2012. The study found that higher interest rates were associated with lower economic expansion. We didn't only look at interest rates; we looked at the budget deficit, inflation, currency exchange rate, and total investment to see how they all played into economic expansion. Since interest rates on loans have a major effect on the growth of an economy, the government needs to take precautions to keep them low. The same holds true for the other metrics used in the study: the trade deficit, inflation, exchange rate, and total investment.

## CHAPTER III

### Data and Methodology

#### Introduction

This chapter discusses the model utilized in this thesis. Understanding the model specification and the equation used to establish the relationship between the dependent and independent variables is essential, and this chapter does just that. Further information and definitions of the assessments utilized in this study are provided here. This chapter covers the ARDL bound, which shows the connection between the dependent and independent variables, and the ADF unit root, which is used to determine whether or not the variables are stationary. More details on residual diagnostic tests including the serial correlation, normalcy, and heteroskedasticity tests are provided here as well. In the final section of this chapter, we discuss two statistical tests—the CUSUM and CUSUM of squares—that evaluate the consistency of data.

#### Data

This study is quantitative in nature. Quantitative data is dependent on quantifying a precise amount or quantity of a phenomenon. It focuses on the collection and analysis of numerical data and may be used to discover averages and trends or to anticipate events.

It belongs to the two basic types of research and depends on numerical evidence. The conclusion is supported by tables, data, and graphs. Numerous scientific and field-based investigations rely heavily on this methodology. This dissertation uses secondary data. For these reasons, as well as the speed and efficiency gained from making use of a previously collected dataset, secondary data is increasingly being incorporated into research designs. Multiple research teams often work together to collect secondary data in support of large-scale research projects. This would allow the lead researcher to zero down on areas of particular interest or conduct primary research. This division of labour allows scholars to obtain more knowledge in less time. This article uses secondary data from the Nigerian Central Bank and World Bank's statistics website to analyze the impact of currency devaluation on Nigeria's economic expansion between 1980 and 2020. The World Bank's databases are indispensable resources that inform important management judgments and provide essential statistical data for the bank's day-to-day activities. Adopting internationally

agreed upon standards and norms ensures a constant and trustworthy data pool. The World Bank's Development Data Group oversees the institution's statistical and data collection efforts and keeps tabs on the bank's many financial and economic databases. All data consumers can have faith in the quality and integrity of the data collected, compiled, and disseminated by the group because of the team's strong collaboration with the Bank's regional and worldwide processes.

### **Data Gathering and Sources:**

In this investigation, secondary resources played a key role. Because it provided context and allowed comparisons to be drawn between past and present experiences, secondary data was appropriate for this study. The word "data collection" is used to refer to any method or practice of getting information, and is a vital aspect of any research activity aimed at providing an explanation for a particular occurrence of interest. This analysis, which looks at how changes in the value of the naira have impacted Nigeria's economy, makes extensive use of secondary data, in particular time series data. The primary purpose of this research was to evaluate the effects of exchange rates fluctuating on the growth of Nigeria's economy.

### **Variables and Usage**

This study relies on economic variables because of their potential to influence monetary systems. All relevant raw data for all relevant variables are collected so that inferences and policy recommendations can be drawn and made.

**GDP growth (annual %)-** GDP growth rate (on an annual basis, in local currency terms) All summaries are expressed as a constant 2015 US dollar amount. The term "gross domestic product"(GDP) refers to the sum value of all final services and goods produced within the borders of an economy, as well as the impact of any product taxes imposed on those goods and services, minus the total value of any subsidies that are not included in the cost of those goods and services. It's calculated without factors like the exhaustion of natural resources or the deterioration of man-made ones being factored in. Total monetary value of all domestically produced goods and services is known as a nation's gross domestic product (GDP). Value added is calculated by subtracting the cost of intermediate goods and services from the final product's selling price. Before investing in any long-term machinery, this is completed. According to the United Nations System of National Accounts, in order



to calculate value-added measures, either "basic prices" (i.e. prices excluding taxes on net products) or producer prices must be used (including net taxes on products paid by producers but excluding sales or value-added taxes). Since manufacturers typically charge customers for transportation charges independently, these expenses are not factored into either estimate. A country's GDP is calculated by adding together all the money its citizens spend. Typically, the producer's cost is used as the basis for determining value added in a given industry. The least squares approach and data on constant prices expressed in the national currency are used to determine GDP and the growth rates of its components. When calculating growth rates for regions and income groups, constant price series in U.S. dollars are typically utilized. Each series of data in a given country's currency is converted to a constant dollar amount in the United States dollar using the prevailing conversion rate from the base year. A nation's economic development can be assessed by looking at how much its output has increased or how much people's actual incomes have risen. The United Nations' 2008 System of National Accounts (2008 SNA) includes three suitable growth metrics: gross domestic product (GDP) amount, real gross domestic income, and real gross national income. The sum of a country's exports over a given time period, in terms of their market value, including those generated by households, the government, and companies. All domestic output, whether earned by domestic or foreign businesses, is included in the gross domestic product calculation. The rate of growth in an industry's value added is one metric that may be used to evaluate how much each sector of the economy has contributed to the expansion of production. Estimating value added at constant prices involves first calculating the quantity of output over a certain time period, then assigning a price to that output using a standard set of prices for the base year, and then subtracting the cost of intermediate inputs at constant prices. The process can be repeated until a stable estimate of value added at constant pricing is found. The incremental cost technique is the formal name for this procedure. This twofold deflation strategy calls for an in-depth understanding of the dynamics of both input and output costs. However, value added is estimated for the following year by comparing actual results with base-year production or, less frequently, input volume indexes in many industries. Especially in the service industry and the vast majority of government, it is common to attribute value added in constant prices to labor inputs like actual compensation or the number of workers. Until there are clear production indicators, it will be difficult to

accurately measure the expansion of the service sector. Metrics of value added and, by extension, growth can be misleading if technological progress that improves production methods and product quality is not adequately accounted for. Unmeasured technical progress causes output underestimate when output is estimated using inputs rather than the other way around, as is the case with nonmarket services. The value of production and value contributed are also underestimated when quality improvements are not tracked. Consequently, growth and productivity gains in the economy may be underestimated, while inflation may be overestimated. Especially in developing countries, where a large portion of activities in the economy are unrecorded, the difficulty of assessing informal economic activities presents itself as a unique one. For a complete picture of the economy, it is important to estimate household production for home use, sales in informal marketplaces, barter exchanges, and illegal or purposely unreported activities. Such estimations are only as reliable as the skills and methods used by the statisticians who generated them. If the national accounts are rebased, the estimated growth rate of the economy may alter, and there may be gaps in the data that make comparisons difficult. By adjusting the relative importance of various variables, countries can better reflect changes in production or consumption through a process known as "rebasings" their national accounts. This means that the new base year should be one in which the economy is operating normally, without any major distortions or shocks. Many developing countries have not revised their official statistics in quite some time. Using a stale base year can produce erroneous findings due to the decline in usefulness and attractiveness of implicit price and volume weights with time. For aggregate calculations, using a single reference year at constant prices, the World Bank rebases both GDP and value added by industrial origin. Aggregate growth rates across different editions with different base years cannot be compared because rescaling alters the implicit weights used to derive regional and income group averages. After rescaling, the revised GDP may not add up to the sum of the revised subtotals. The difference is not given so that the growth rates are not skewed. As a result, the GDP growth rate is not always equal to the weighted average of the component growth rates.

**Real effective exchange rate index (2010 = 100)-** By dividing the nominal effective exchange rate by a suitable price deflator or cost index, the effective exchange rate may be determined. An index of the nominal effective exchange rate, the real

effective exchange rate is calculated by looking at how prices and costs vary within a country relative to others in the same region (or a select group of countries) as well as the Eurozone as a whole. Using 2010 = 100 as the base year and an exchange rates geometric weighted average for a number of nations and the Eurozone, we can determine the nominal effective exchange rate. High-income nations get a significant portion of their wealth from the trade that occurs in manufactured goods between industrialized countries. It is possible for us to get at these statistics by utilizing the cost indicator of relative normalized unit labor costs in conjunction with the nominal effective exchange rate index in manufacturing. The trade in manufactured goods and basic products with nations that are either partners or competitors is used to calculating the nominal effective exchange rate index for certain other countries. If the real effective exchange rate index goes up, it indicates that the value of the local currency is growing in comparison to the nominal index for these countries. In a market economy, the relative pricing of services and goods, such as the real wages, interest rates, and real exchange rate, all have an effect on the resource allocation decisions made by households, producers, and governments. The decisions made by these parties are also reflected, to a considerable extent, in the pricing structure that is relative to them. Therefore, comparative pricing reveals crucial data on how diverse economic actors collaborate or compete inside the confines of a given country as well as beyond international borders. Changes in real effective exchange rates ought to be regarded with extreme caution because of the constraints imposed by both concepts and data.

**Broad money (% of GDP)**- The term "broad money" refers to the aggregate of all forms of legal tender in circulation, including cash outside of banks, non-central-government demand deposits, non-central-government time, savings, and foreign currency deposits, bank and traveler's checks, and other securities such as certificates of deposit and commercial paper.

**Foreign direct investment, net inflows (% of GDP)**- To invest directly in a firm based in a country other than one's own in order to exercise significant influence over its management for an extended period of time (10 percent or more of voting shares) is known as "foreign direct investment." Capital consists of a wide variety of things, including retained earnings, currency, equity, working capital, and other long-term capital. To calculate the net inflow of FDI into a country, one must first subtract the amount of FDI into the country from the amount of FDI leaving the country. Using

data from the balance of payments, the IMF calculates the equity flows of enterprises based in economies other than the investors' own (10 percent or more of voting shares). Capital account is the sum of equity capital, reinvested earnings, other long-term capital, and current account capital in the international balance of payments. The amount of foreign direct investment (FDI) that flows into a country is calculated by deducting the amount of FDI that leaves that country. Information from the IMF's balance of payments is used to construct data on equity flows. World Bank staff members contribute estimates to improve FDI data, drawing on data from the United Nations Conference on Trade and Development (UNCTAD) and official national sources. According to the internationally accepted definition of foreign direct investment (as found in the sixth edition of the IMF's Balance of Payments Manual, 2009), FDI encompasses not only equity investment but also investment associated with equity that gives rise to control or influence, investment in indirectly influenced or controlled enterprises, investment in fellow enterprises, debt (except for selected debt), and reverse investment. The criteria for a direct investment relationship can be found in the Framework for Direct Investment Relationships, which you should refer to in order to establish if your cross-border ownership fits those requirements. When compared to other forms of international investment, foreign direct investment (FDI) stands out, since its primary goal is to acquire a controlling position in a company based in a foreign country. The construction of warehouses, factories, and other long-term institutions in other countries is generally seen as an enterprise with a long time horizon. One way to invest abroad is through a "greenfield" investment, in which the investor builds brand-new production facilities; another is through a "joint venture," in which the investor and a foreign company form a partnership to launch a new business; and yet another is through a "merger and acquisition," in which the investor purchases an existing company in the target country. The International Monetary Fund (IMF) stipulates that at least 10 percent of voting stock must account for investments in order to be considered foreign direct investment (FDI). In reality, however, some foreign jurisdictions have more stringent standards. Many nations don't even bother to track reinvestment earnings, and there is no universally accepted definition of long-term loans. BoP refers to the topic of the international trade balance. It's possible that foreign direct investment data doesn't tell the complete story of a country's FDI. Locally-raised money is not included in the balance of payments data of FDI, despite being a large contributor to the magnitude of

investment funds in many developing nations. In addition, international deals that do not entail an equity investment are not accounted for in FDI figures. The World Bank's estimate of worldwide private financial flows differs from other estimates due to discrepancies in classification of economies, data collection, and the method used to adjust and disaggregate the data. Particularly with regard to debt financing, inconsistencies may also arise from the treatment of some transaction installments and certain offshore issuances. Equity flow data covers all countries for which it is accessible.

**Inflation, GDP deflator (annual %)**- As a proxy for the pace of general price rise in the economy, the yearly rate of change in the GDP implicit deflator is a widely used inflation indicator. Simply dividing the current GDP by the constant GDP stated in the same currency will yield the GDP implicit deflator.

**Real interest rate (%)**-The real interest rate is the lending rate less the GDP deflator, which accounts for inflation. Although it is possible to compare loan rates between countries, it is limited by the fact that each country's conditions and circumstances are different. Competition, regulations controlling deposits and loans, and differences in the relative positions of creditors and borrowers all contribute to the existence of multiple interest rates in any economy. The interest rate is set by law or executive order in several economies. It may be difficult to collect interest rate statistics that are indicative of market transactions in countries with imperfect markets or if the nominal rates reported do not reflect the effective rates. The rate that borrowers actually pay is called the "real interest rate," which is calculated by subtracting the lending rate from the GDP deflator. Although it is possible to compare loan rates between countries, it is limited by the fact that each country has its own unique set of characteristics and situations. Interest rates can vary in any economy due to factors such as the level of competition, the rules governing loan and deposit transactions, and the relative power of creditors and borrowers. In many economies, the interest rate is determined by statute or executive decree. In nations with imperfect markets or where the nominal rates published do not represent effective rates, it may be challenging to acquire interest rate statistics that are indicative of market transactions. Financial institutions' assets include both domestic net credit and international net assets. The nonfinancial public sector's share of net domestic credit consists of investments in both short- and long-term government securities and loans to state firms. Public and private bank deposits are equivalent to

the entire debt. The term "net domestic credit" refers to loans made by domestic financial institutions, including both traditional banks and non-banks. Central bank loans to the government play a crucial role in many scenarios, but domestic credit is the fundamental mechanism for controlling the money supply. Bank reserve requirements and bank-issued credit limits are two methods the central bank could use to control lending to the private sector. Capital flight, the business cycle, and economic bubbles are only some of the occurrences that the real interest rate is used to explain by many economic theories. When interest rates are high or when there is a great demand for borrowing, consumers will adjust their spending habits to prioritize savings. Low real interest rates encourage spending rather than saving by individuals and companies.

### **Model specification**

Selecting which variables will be used in a model is known as "model specification" (MacCallum, 1995). There is a trade-off between include all relevant variables and maintaining statistical power in model specification. "Model specification" refers to the process of deciding which independent variables should be used in a regression equation and which should be left out. Theoretical issues should play a larger role than empirical or methodological considerations when defining a regression model. The following model assumes the following variables significantly affect economic growth: exchange rate, inflation rate (GDP) broad money, interest rate, and foreign direct investment.

$$GDP = f(REER, BM, FDI, INF, RIR) \dots \dots \dots 1$$

$$GDP_t = \beta_0 + \beta_1 REER_t + \beta_2 BM_t + \beta_3 INF_t + \beta_4 FDI_t + \beta_5 RIR_t + \mu_t \dots \dots \dots 2$$

Where:

*GDP is gross domestic product annually*

*REER is the real effective exchange rate*

*BM is the broad money*

*FDI is the foreign direct investment*

*INF is the inflation rate*

*RIR is the real interest rate*

$\beta_1, \dots, \beta_5$  is the constant of the perimeter

$t$  is the time interval for the research (1980-2020)

$\mu$  is the error term.

### **Descriptive Statistics**

Brief but useful, descriptive statistics characterize a data set, be it the entire population or a subset of it. Indicators of central tendency and variability are part of descriptive statistics (spread). Descriptive statistics are used to describe and make sense of a data set by providing an overview of the sample and the data measurements used to create the set. Mean, standard deviation, and frequency are all examples of descriptive statistics that can be used to summarize or explain a data set or a specific sample within it. In mathematics and statistics, the most widely used descriptive statistics are the mean, median, and mode. To generate an average, we sum up all the numbers in the collection and divide by the total number of values. Inferential statistics can assist us learn about the characteristics of subsamples in a data set. Accordingly, this study's initial step was compiling descriptive data on the study's independent variables, such as the number of participants, and its dependent variables, such as GDP as a surrogate for economic growth. Data on Nigeria's imports, exports, real interest rate, inflation rate, and real effective exchange rate were collected from 1980 to 2020 using the World Bank's World Development Indicator. The first steps of every quantitative investigation must include the use of descriptive statistics. These numerical representations not only provide a bird's-eye view in a usable manner, but also aid in the logical distillation of large volumes of data.

### **Stationary test**

Time series analysis relies heavily on the idea of stationarity. Take a look at my earlier blog article on the issue for a quick (but extensive) introduction to the topic and the reasons why it is vital. Stationarity is the property that the statistical properties of a time series (or, more precisely, the process that creates them) do not change over the course of the series. Many useful analytic methods, statistical tests, and models rely on stationarity as a foundation. In checking for stationarity or a unit root, the augmented Dickey Fuller (ADF) unit root test is used. To determine if there

is series is stationary or if there is a unit root, we look at the characteristics of the variables across time (GDP, REER, INF, BM, FDI, and INF). In academic writing, a variable is considered stationary if it does not have a unit root.  $I(d)$ , where  $d$  is the number of unit roots that the variable has and, hence, the number of unit roots that must be differenced from to make it stationary, represents the number of unit roots that a non-stationary variable may include.

### **Property of Time Series Data and Stationarity**

The non-stationarity of time series data is sometimes seen as an issue while conducting empirical research. Erroneous results or regression findings from working with non-stationary variables might lead to erroneous inferences if the results are employed further. Over the course of observation, the mean, variance, and autocorrelation structure of a stationary process will remain constant. Stationarity is a mathematical concept that characterizes a time series that appears to be unchanging and free of trend, has a constant variance, an unchanging autocorrelation structure, and no periodic oscillations. "Stationary series are those in which the mean and autocorrelation of the series are not changed by changes in the length of time that has elapsed since the beginning of the series" (Gujarati and Porter, 2009). In other words, the passage of time has no effect on stationary series. This highlights the critical need of conducting a stationarity test before to undertaking any form of regression analysis. The Phillip-Peron or the Augmented Dickey-Fuller (ADF) test can be used to do this.

### **Procedure when one has data that is not stationarily aligned:**

Time series data that is not stationary can often be transformed into stationary form using one of the following methods or procedures. The information can be compared and contrasted. The data's average can be calculated. There may be multiple instances of variation in the data, but typically we need only find one.

It is possible to predict the residuals from a data-curve-fitting exercise if the data exhibit a pattern. It is common practice to utilize a straight line fit when the sole purpose of the fit is to eliminate a long-term tendency.

The non-constant variance may be stabilized by taking the logarithm or square root of the series. If the dataset contains any negative values, you may choose to supplement it with a suitable constant before executing the transformation. With this done, all of the numbers will be transformed into the positive range. By subtracting



this constant from the model, one can obtain not just the projected values (also called fitted values), but also projections for future points.

### **ADF UNIT ROOT TEST**

When analyzing time series data, statisticians typically use a test called the Augmented Dickey Fuller test to determine whether or not the data are stationary (ADF test). In the field of statistics, this test is a tried-and-true technique for assessing whether or not a particular data series remains constant throughout time. The traditional Dickey-Fuller (DF) test has been given a contemporary makeover in the form of the Augmented Dickey-Fuller (ADF) analysis. When it is believed that the series will follow an AR (p) process, one will apply a parametrically modified version of the DF test for spurious correlation called the ADF test. This test is known as the test for spurious correlation. It is standard procedure in the study of statistics and economics to use a variant of the Dickey-Fuller test known as the modified Dickey-Fuller test in order to investigate time series data in search of indications of the existence of a unit root (ADF). The trend-stationarity or stationarity hypothesis can be shown to be false, depending on the results of the analysis. This test is a complex and adaptable variation on the traditional Dickey-Fuller test that may be used to a wide variety of time series models. The test was named after the two statisticians who developed it. The Augmented Dickey-Fuller test is a reliable approach for determining serial correlation. [Case in point:] In comparison to the Dickey-Fuller test, the ADF test is more reliable and is able to deal with models that are more complicated. As a result of the relatively high rate of Type I error that unit root tests generate, additional caution is required.

### **ARDL BOUND TEST**

Pesaran et al. (2001) developed the autoregressive distributed lag (ARDL) bound test with the intention of determining whether or not two or more series share a long-term connection with one another. Recent empirical studies have used the ARDL method to examine the relationship between climate change and other agricultural parameters. Some examples of these studies include Asumadu-Sarkodie and Owusu (2016), Arshed and Abduqayumov (2016), and Bergstrom et al. (2016). These are just a few examples of recent empirical studies. Acaravci, Ozturk, & Ozturk, (2010). The ARDL is a method that works well with sets of data that are

sparse because it is so effective at locating variable integrations. As a result, the purpose of this study was to evaluate the long-term and short-term effects of weather, technology, and agricultural policy (1990) on the harvest of rice in Korea using the ARDL model. As a direct result of the research carried out, a number of suggestions will be offered, all of which will be founded on the findings. For the purpose of determining the ideal latency, both the Akaike Information Criterion (AIC) and the Schwarz Bayesia Criterion are utilized (SBC). If your sample size is quite small, you should use Narayan's (2005) critical limits to evaluate the significance of your F-statistics; if your sample size is rather large, you should consult Pesaran et al (2001).

### ARDL MODEL

Autoregressive Distributed Lag (ARDL), a method created by Pesaran et al. (2001), was utilized to carry out the analysis. The econometric model ARDL is the one of choice when the variables are either stationary at I (0) or integrated to order I. (1). The model does an excellent job of capturing the short-term and long-term effects of external variables on rice yield, which is important given the goals of the study. The ARDL method, based on the ordinary least squares (OLS) method for variable cointegration, makes it easy to generate short-run and long-run elasticities from a small data set (Duasa 2007). There is flexibility in the order of integration when using ARDL. In a model with independent variables, ARDL succeeds when all of the variables are either I(0), I(1), or mutually cointegrated, but fails when any variables are I(2), as stated by Frimpong and Oteng (2006). Therefore, based on equation (2) the ARDL model equations is developed as under:

$$\Delta GDP_t = \beta_0 + \sum_{i=1}^p \gamma_1 \Delta GDP_{t-i} + \sum_{i=0}^{q1} \beta_1 \Delta REER_{t-i} + \sum_{i=0}^{q2} \beta_2 \Delta BM_{t-i} + \sum_{i=0}^{q3} \beta_3 \Delta RIR_{t-i} + \sum_{i=0}^{q4} \beta_4 \Delta FDI_{t-i} + \sum_{i=0}^{a5} \beta_5 INF + \varepsilon_t \dots 3$$

Furthermore, the equation (3) has been modified for the error correction term and presented as under:

$$\begin{aligned} \Delta \text{GDP}_t = & \alpha_0 + \sum_{i=0}^q \Delta\beta_1 \text{InGDP}_{t-k} + \sum_{i=0}^p \Delta\beta_2 \text{InREER}_{t-k} + \sum_{i=0}^p \Delta\beta_3 \text{InBM}_{t-k} \\ & + \sum_{i=0}^p \Delta\beta_4 \text{InRIR}_{t-k} + \sum_{i=0}^p \Delta\beta_5 \text{InFDI}_{t-k} + \sum_{i=0}^p \Delta\beta_6 \text{InINF}_{t-k} + \lambda \text{ECM}_{t-1} \\ & + \varepsilon_t \dots \dots \dots \dots \dots \dots 4 \end{aligned}$$

This study examined the long- and short-term effects of exchange rate fluctuations on the growth of the Nigerian economy from 1980 to 2020, and the aforementioned equations (3) and (4) are the statistical representation of the ARDL model utilized in this analysis. Long-term and short-term effects of exchange rate fluctuations on economic growth in Nigeria were examined. The purpose of this research was to determine whether or not fluctuations in the value of the naira over a period of more than three decades affected the rate of economic growth in Nigeria. To ensure the model's validity, robustness, and dependability, we subjected it to three separate statistical tests. Three such tests include the Breusch-Godfrey serial correlation test, the Breusch-Pagan-Godfrey heteroskedasticity test, and the Jarque-Bera normality test.

## RESIDUAL DIAGNOSTIC

### Serial correlation LM test

An autocorrelation test for regression model errors can be conducted with the use of the Breusch-Godfrey LM test. This test examines the serial correlation of the data. In order to compute a test statistic, a regression analysis makes use of the residuals produced by the model that is currently under discussion. The assumption behind the null hypothesis is that there is no serial correlation of any rank up to  $p$ . It is often referred to as an LM test for serial correlation due to the fact that it is founded on the principle of Lagrange multiplier testing. Stephen G. Hall (2011). The Durbin-Watson test and the Ljung-Box test can be used to conduct a similar analysis. The test is more generic than the Durbin-Watson statistic (or Durbin's  $h$  statistic), which is only applicable for non-stochastic regressors, when assessing the likelihood of a first-order autoregressive model (ARDL) for the regression errors.

### **Heteroskedasticity test**

The Breusch-Pagan Test was created by researchers Trevor Breusch and Adrian Pagan in 1979. Assuming the error components are normally distributed, it is employed in a linear regression model to check for heteroskedasticity. Checks whether the independent variables have an effect on the variance of the errors in a regression. Standard deviations of a predicted variable exhibit heteroskedasticity (or heteroscedasticity) when viewed throughout a range of values for an independent variable or in relation to prior time periods. Heteroskedasticity can take both conditional and unconditional forms. Examining volatility over time with conditional heteroskedasticity reveals that it varies with respect to historical volatility (e.g., daily). Unconditional heteroskedasticity refers to structural shifts in volatility that are independent of the historical volatility. Unconditional heteroskedasticity is utilized in cases where both high and low volatility in the future are possible to predict.

### **Normality test**

Data analysis often begins with a test of normality. There are a variety of statistical methods available, but many of them require that data be assumed normal. There may be a need to switch to a different statistical approach if this assumption is broken. The term "normality" will be defined, and various normality tests will be discussed in this article. We'll also go over some guidelines for deciding when and how to perform a normality test, as well as the benefits of doing so. The "normal distribution," often called the "Gaussian distribution" or the "bell-shaped curve," is the statistical distribution most commonly associated with the term "normality." The mean and standard deviation of a set of data define the normal distribution, a symmetrical continuous distribution.

### **Granger Causality Test**

G-causality predicts effects based on the notion that causes exist before their effects and may be foreseen. Since Norbert Wiener established the concept, Clive Granger (Granger, 1969) has used it to develop linear vector autoregressive (VAR) models of random time series data, with notable expansions by John Geweke and others (Geweke, 1982). Virtually all regression models (VARs) are simple mathematical models in which the value of a variable at any given time is explained as a (linear) weighted total of the data points in the past (typically across a number of

discrete time steps) and the value of a group of additional variables in the past. Vector random processes store time series in each variable. Variables represent each process differently. Before fitting a VAR model, select the proper weights to reduce estimation errors.

Various methods exist. X is "G-caused" by Y if its history helps forecast Y's future. Y, plus any knowledge from Y's past (as well as any "conditioning" factors Z) at the time of Y. This aim is achieved when X and Y have "information flow" between them. Barnett et al. (2009) say it's appropriate to use G-causality, which estimates transmitted entropy. This application uses Shannon's similarity metric. Shannon's similarity metric determines how statistically linked two variables are. The standard Granger causality test requires the testing of the null hypotheses that REER does not produce GDP and vice versa, that FDI do not influence GDP, Interest rate does not granger cause GDP and, finally, that broad money does not cause FDI. This is done by simply running the following two regression models:

$$\Delta \ln GDP_t = \lambda_0 + \sum_{i=1}^m \lambda_{1i} \Delta \ln GDP_{t-i} + \sum_{i=1}^n \lambda_{2i} \Delta REER_{t-i} + \sum_{i=1}^p \lambda_{3i} \Delta RIR_{t-i} + \sum_{i=1}^q \lambda_{4i} \Delta \ln BM_{t-i} + \sum_{i=1}^q \lambda_{4i} \Delta \ln FDI_{t-i} + \mu_t \dots \dots \dots 5$$

$$\Delta \ln REER_t = \lambda_0 + \sum_{i=1}^m \lambda_{1i} \Delta \ln REER_{t-i} + \sum_{i=1}^n \lambda_{2i} \Delta GDP_{t-i} + \sum_{i=1}^p \lambda_{3i} \Delta RIR_{t-i} + \sum_{i=1}^q \lambda_{4i} \Delta \ln BM_{t-i} + \sum_{i=1}^q \lambda_{4i} \Delta \ln FDI_{t-i} \varepsilon_t \dots \dots \dots 6$$

Current GDP is linked to both historical GDP and values of the real effective exchange rate, as shown in Equation (5), and the inverse is true, as shown in Equation (6). (6). A unidirectional causal relationship between the real effective exchange rate and GDP growth exists if and only if the estimated coefficients on the lagging real effective exchange rate in equation (5) are statistically different from zero as a group (that is,  $A_i \neq 0$ ), and the set of estimated coefficients on the lagging GDP in equation (6) is not statistically different from zero (that is,  $D_j = 0$ ). A statistically significant dissimilarity between the estimated coefficients on the

lagging inflation in equation (5). It turns out that the relationship between GDP and inflation looks very different when evaluated from just one way. Inflation and GDP are said to have a bidirectional causal relationship when the sets of coefficients for both regressions are significantly different from zero. A similar term for this is "bidirectional causal loop." A feedback or bidirectional causal link exists when there is a statistically significant divergence from zero between the sets of inflation and GDP coefficient in both regressions (Gujarati, 2004).

### **Stability test**

Cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests have been proposed by Brown et al. (2009) to evaluate stability in short-run and long-run coefficients, respectively, given that structural changes exist in all variables due to one or more structural breakdowns (1975). The continued success of the CUSUM and CUSUMSQ rice lines, both of which are significant at the 5% level, is evidence of the stability and fitness of the ARDL model. Values in the series that are outside of the predicted range suggest a shift in the underlying structure of the model over time, in line with the null hypothesis of coefficient stability. The Breusch-Godfrey serial correlation test, the Breusch- Pagan-Godfrey heteroskedasticity test, and the Jarque-Bera normalcy test are utilized in this work to assess the model's validity, robustness, and reliability. As part of any significant modeling endeavor, many types of diagnostic and stability testing should be carried out. In addition, the model's reliability could be greatly enhanced by the many tests that are presented below. Understanding how much the data is correlated with itself is crucial. This can be done by comparing the values of the residuals to the expected values and displaying the value of the residuals in respect to the projected values. The use of an example is another viable strategy. By comparing the probability value to the calculated F-statistics, we can conclude that the model is either heteroscedastic or homoskedastic, leading us to reject the null hypothesis.

### **Conclusion**

We clearly and concisely presented the research's key methodology, procedure, and structure, all of which relied on data from the World Development Index (World Bank). Our sample spans the years 1971-2020, therefore we took great care in our selection. We used a wide range of resources to ensure the accuracy of

our data, including (E-views 12). First, we conduct a summary of all the variables in this study using descriptive statistics, and then we utilize the Augmented Dickey-Fuller and Phillips-Perron tests for unit root. We did the Johansen co-integration test to determine the strength of the correlations between our variables and to determine whether or not they were involved in the long-term relationships we had hypothesized. The models' resilience and their capacity to regulate were finally tested using a battery of diagnostics and stability tests, including the Breusch-Pagan, heteroskedasticity or white test, and serial correlation LM test.

## CHAPTER IV

### Introduction

This chapter's objective is to analyze the various findings and have an in-depth discussion of the tables and charts that are related to them. Since descriptive statistics provide a summary of the variables utilized in this research, we begin by conducting an analysis of these statistics in order to determine the variables that are dependent and those that are independent, as well as the essential characteristics that each variable possesses. After this, an examination of the variables in terms of stationarity will be carried out by interpreting the Augmented Dickey-Fuller test as well as the Phillip Perron test. This will come after the previous step. Following that, we will investigate the concept of a co-integration test by simply performing the bound test and their respective interpretations. This will point us in the direction of whether or not it is necessary to carry out a short-run and a long-run ARDL test. If we determine that there is cointegration for the variable that was employed, then it is imperative that both short-run and long-run ARDL tests be carried out in order to determine the nature of the relationship that exists between the variables in question. After that, the Granger causality test will be carried out, and a comprehensive discussion will follow. This test is designed to give researchers a hint as to the direction of one variable relative to another or the causal direction of variables, and it will be carried out next. In addition to the material that is offered in this section, a debt analysis as well as a discussion of the regression that was performed will also be presented, along with the conclusions, consequences, and policy recommendations that are specific to each.

In the end, a large number of diagnostic and stability tests on the data will be carried out, and the results of those tests will be thoroughly explained. In order to successfully run the variables and evaluate all of those economic elements, the tried-and-true E-Views 12 program was utilized.

Here, we focus on the results and findings that were obtained by employing EViews 12. The ADF unit root test, which determines whether or not the variables are stationary; the ARDL bound test, which determines whether or not the variables are connected in the long run; the ARDL short-run and long-run tests; and the residual diagnostic and stability tests; were all positive. Stationarity is tested by locating the ADF unit root.



## Descriptive Statistics

Brief but useful, descriptive statistics characterize a data set, be it the entire population or a subset of it. Indicators of central tendency and variability are part of descriptive statistics (spread). Descriptive statistics are used to describe and make sense of a data set by providing an overview of the sample and the data measurements used to create the set. In mathematics and statistics, the most widely used descriptive statistics are the mean, median, and mode. The average is calculated by adding together all the numbers in the dataset and dividing by how many numbers there are in total.

**Table 4.1 Descriptive statistic**

|              | GDP       | INF      | REER     | RIR       | BM       | FDI       |
|--------------|-----------|----------|----------|-----------|----------|-----------|
| Mean         | 3.055069  | 21.44787 | 151.3957 | 0.337111  | 16.66516 | 1.435467  |
| Median       | 4.195924  | 11.11892 | 100.5760 | 4.310292  | 13.52700 | 1.093559  |
| Maximum      | 15.32916  | 219.0028 | 536.8903 | 18.18000  | 28.62522 | 5.790847  |
| Minimum      | -13.12788 | 0.686099 | 49.74471 | -65.85715 | 9.063329 | -1.150856 |
| Std. Dev.    | 5.387712  | 34.70035 | 117.7697 | 14.27219  | 6.109432 | 1.297427  |
| Skewness     | -0.825581 | 4.745691 | 1.784395 | -2.685826 | 0.554389 | 1.419837  |
| Kurtosis     | 4.621278  | 27.10318 | 5.414266 | 12.77500  | 1.691710 | 5.698300  |
| Jarque-Bera  | 9.147918  | 1146.376 | 31.71512 | 212.5258  | 5.024230 | 26.21364  |
| Probability  | 0.010317  | 0.000000 | 0.000000 | 0.000000  | 0.081097 | 0.000002  |
| Sum          | 125.2578  | 879.3628 | 6207.224 | 13.82156  | 683.2715 | 58.85415  |
| SumSq.Dev.   | 1161.097  | 48164.58 | 554788.1 | 8147.812  | 1493.006 | 67.33268  |
| Observations | 41        | 41       | 41       | 41        | 41       | 41        |

*Source: E-View 12 calculation for this study*

Table 4.1 provides descriptive data on Nigeria's gross domestic product growth, real effective exchange rate, inflation rate, total, real interest rate, broad money, and foreign direct investment from 1980 to 2020. These numbers represent the years 1980 through 2020 in Nigeria. Table 1.1 shows that this study used a total of 41 observations across all variables.

Statistics used to characterize a particular data set, which may or may not be typical of the entire population, are known as descriptive statistics. Brief, yet illuminating coefficients make up descriptive statistics. Descriptive statistics

include measures of central tendency and measures of variability (spread). Central tendency is measured by the mean, median, and mode, whereas variability is measured by the standard deviation, variance, minimum and maximum variables, kurtosis, and skewness. Central tendency measures, such as the mean, median, and mode, can be used to generalize about a population or a specific subgroup within it. Coefficients that are both succinct and illuminating make up descriptive statistics. Descriptive statistics include measurements of central tendency and measures of variability (spread). Standard deviation, variance, minimum and maximum variables, kurtosis, and skewness are measures of variability; the mean, median, and mode are indices of central tendency. Central tendency measures include the mean, median, and mode. In this study, the real exchange rate and value had the greatest mean of 151.3957, while the means for GDP growth and inflation were 3.055069 and 21.44787, respectively. The largest conceivable GDP growth rate is 15.329 percent, which equates to a 72.835 percent inflation rate and a 536.890 percent real exchange rate. A severely skewed distribution has a skewness value that is more than 1 or less than -1. A number with a highly skewed distribution is one that falls between 0.5 and 1 or -0.5 and -1. A value between -0.5 and 0.5 indicates that the distribution is reasonably symmetrical. When a dataset's kurtosis score is more than 3, it has bigger tails than a normal distribution. If the kurtosis score is less than 3, the dataset in question has thinner tails when compared to a normal distribution.

### **Unit root**

To determine whether or not a time series is stationary, the Augmented Dickey Fuller test (ADF test) can be used. As a statistical method, it is widely employed to look for evidence of stationarity in time series. The Dickey-Fuller (DF) test's predecessor, the Augmented Dickey-Fuller (ADF) test, was created as a modern alternative. Parametrically adjusting the standard DF test for spurious correlation, ADF assumes the series follows an AR (p) process. using an augmented Dickey-Fuller test (ADF), the existence of a unit root in a time series sample can be tested, a statistical and econometric approach. The alternative hypothesis of stationarity or trend-stationarity is often used; however it can take on a variety of forms depending on the methodology used to examine it. The Dickey-Fuller has been improved in this test so that it may be used with more complicated models of time series data. One reliable method for serial correlation is the Augmented Dickey-

Fuller test. When compared to the Dickey-Fuller test, the ADF test is more reliable and can be applied to more complicated models. Similar tests have a high Type I error rate, so use cautious while using this one.

**Table 4.2 ADF unit test**

| ADF UNIT ROOT TEST |        |                            |                      |
|--------------------|--------|----------------------------|----------------------|
| Variables          | Level  | 1 <sup>st</sup> difference | Order of integration |
| BM                 | 0.1930 | 0.0000***                  | I(I)                 |
| REER               | 0.3098 | 0.0000***                  | I(I)                 |
| INF                | 0.0000 | -0-                        | I(0)                 |
| GDP                | 0.0835 | 0.0000***                  | I(I)                 |
| FDI                | 0.0027 | -0-                        | I(0)                 |
| RIR                | 0.0006 | -0-                        | I(0)                 |

*Source: This work*

*Note: Automatic selection, Schwarz Info Criterion \*\*\*; \*\* and \* represent 1%, 5% and 10% significance level used respectively.*

Table 4.2 shows the ARDL unit root test, and the results reveal that all of the variables in this thesis are stationary. Inflation, FDI, and the real interest rate all have p-values of 0.0000, 0.0027, and 0.006, respectively, indicating that they are stationary at their current levels. Broad money, the real effective exchange rate, and GDP growth are the three of the six variables that are also stationary at the initial difference, each having p-values of 0.0000. For this reason, the ARDL model was utilized, which is consistent with the stationary findings.

### **ARDL bound test**

To uncover the time-serial link, Pesaran et al. (2001) designed the autoregressive distributed lag (ARDL) bound test. Some recent empirical research have employed the ARDL technique to investigate the connection between climate change and other agricultural factors (Asumadu-Sarkodie, Owusu, & Owusu, 2016; Arshed, Abduqayomov, & Abduqayomov, 2016; Acaravci, Ozturk, & Ozturk, 2010). This research used the ARDL model to analyze the effects of weather conditions,

technological advances, and government policies from 1990 on rice yields in Korea. The study will also provide suggestions based on the findings. Optimal latency is determined using either the Akaike Information Criterion (AIC) or the Schwarz Bayesian Criterion (SBC). Narayan's (2005) critical limits can be used for small samples, although Pesaran et al (2001).

**Table 4.3 ARDL bound test**

| <i>Model</i>                    |                 | <i>Lag.</i>          | <i>F-Statistic</i> |             | <i>Decision</i>             |             |
|---------------------------------|-----------------|----------------------|--------------------|-------------|-----------------------------|-------------|
| <i>GDP, BM, REER, INF, FDI,</i> |                 | <i>(2,4,4,4,4,4)</i> | <i>8.112348***</i> |             | <i>Co-Integration Exist</i> |             |
| <i>RIR</i>                      |                 |                      |                    |             |                             |             |
| <i>Bond</i>                     | <i>Critical</i> |                      |                    |             |                             |             |
| <i>Value</i>                    |                 |                      |                    |             |                             |             |
|                                 |                 |                      |                    | <i>I(0)</i> |                             | <i>I(1)</i> |
| <i>Sign.</i>                    |                 | <i>10%</i>           |                    | <i>2.08</i> |                             | <i>3</i>    |
|                                 |                 | <i>5%</i>            |                    | <i>2.39</i> |                             | <i>3.38</i> |
|                                 |                 | <i>2.5%</i>          |                    | <i>2.7</i>  |                             | <i>3.73</i> |
|                                 |                 | <i>1%</i>            |                    | <i>3.06</i> |                             | <i>4.15</i> |

Table 4.3 displays the ARDL bound test results of, which is used to assess the long-run relationship between the research variables. Since the estimated F-statistics value of 8.112348 is more than the upper limit value at the 5% level of significance, this suggests that the research variables have a long-run correlation.

**Table 4.4 ARDL long and short run test**

| Variables      | Coef.   | P value   |
|----------------|---------|-----------|
| ARDL long run  |         |           |
| BM             | -0.301* | 0.0587*   |
| REER           | -0.030  | 0.0052**  |
| INF            | -0.440  | 0.0001*** |
| FDI            | -2.245  | 0.0005*** |
| RIR            | 0.421   | 0.0481**  |
| ARDL short run |         |           |
| GDP            | -0.566  | 0.000***  |
| REER           | -0.027  | 0.0007*** |
| BM             | -0.243  | 0.0196**  |
| FDI            | -2.245  | 0.000***  |
| INF            | -0.309  | 0.004**   |
| RIR            | 0.070   | 0.4700    |
| ECM            | -0.262  | 0.0000    |

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

Short-run and long-run ARDL test results are displayed in Table 4.4 They prove the presence of a short and long-run link between the used variables of interest.

Statistically, there is a significant negative correlation between the exchange rate and Nigeria's economic growth, with a one percent rise in the rate having a short-term impact of 0.027 and a long-term impact of 0.030. Obansa, Okoroafor, Aluko, and Eze reached a similar result in their work on the Nigerian economy from 1970 to 2010, in which they sought to empirically demonstrate the relationship between the exchange rate, the interest rate, and economic growth. Two distinct economic epochs, the regulatory and the deregulation, were used to categorize the research period. The study employed a vector auto-regression (VAR) strategy, with an

emphasis on the impulse response component and the variance breakdown of forecast errors. The results specified that the exchange rate was more important to economic growth than the interest rate. In particular, interest rates were found to have a positive effect, but one that diminished with increasing time horizon. During the era of regulation, it was less influential on economic growth than it was during the era of deregulation. According to the data collected for this study, allowing for a freer market in currency exchange would be beneficial to Nigeria's economy. However, interest rate liberalization has minimal impact on GDP growth since it dampens the investment drive. In light of these findings, the study advocates reverting to the policy of interest rate restriction that was in effect during the 1970s and 1980s. The correlation between wide money and economic growth in Nigeria is negative and statistically significant. In line with Omodero's (2019) conclusion, this study analyzes how monetary policy affects growth in the economies of Nigeria and Ghana. The primary aims of the research are to analyze the impact of money supply mechanisms on economic growth in both Nigeria and Ghana, both collectively and separately. The study employs an ordinary least squares regression method to examine data from 2009 to 2018. Statistics show that broad money supply (M2) has a somewhat negative impact on RGDP in Nigeria but a significantly beneficial impact in Ghana. When comparing Nigeria and Ghana, CPS has a marginally favorable effect on RGDP, while M3 has a significantly negative effect. The study suggests that the central banks of the two countries work together to develop monetary policy strategies that will help drive the economies more effectively, and that these strategies should take M2 and CPS into greater account due to the roles they play in economic expansion, which in turn leads to higher output and employment rates. Overseas direct investment (FDI) and inflation both hurt Nigeria's economy significantly. Similar findings were made by Muritala (2011), who used an Ordinary Least Square (OLS) econometric model to examine the impact of investment and inflation on economic growth performance in Nigeria from 1981 to 2006. When testing the hypothesis that investment, inflation, and GDP growth are all interconnected over the long run, the regression results show that the inflation coefficient is negative and significant at 10%, while the GCF coefficient is positive and significant at 1%. The data seem to indicate that for every one percent increase in inflation, there is a corresponding nine point zero percent decrease in economic output (RGDP). Therefore, real gross domestic product (RGDP) inflation is

negatively correlated with RGDP. A 1% shift in GCF leads to a 0.3% shift in RGDP (economic performance), indicating a positive link between the two variables. Improved economic performance could result from reduced capital flight as a result of higher investment leading to higher consumption, labor productivity, and production. Short- and long-run efforts to reduce inflation may suggest supply- and demand-side policies including reducing the real broad money supply. In addition, we utilize Pakistan to test Saqib, Masnoon, and Rafique's hypothesis that foreign direct investment (FDI) leads to economic growth in the host country (2013). The study relied on information gathered from 1981 to 2010. The GDP of the country is regressed on the basis of FDI and four other factors: debt, trade, inflation, and domestic investment. The least squares method has been used to examine the effect of these factors on Pakistan's economy. In order to determine whether or not the variables were long-run co-integrated, we used the Augmented Dickey-Fuller Test. The results show that while international investment hurts Pakistan's economy, domestic investment helps it grow. There is also evidence that the national debt, trade, and inflation all weigh down GDP. This thesis uses the ECM value to indicate the rate of change from the short to long run of the dependent variable. The maximum feasible rate of this adjustment is 26%.

Residual Diagnostic

**Table 4.5 Residual diagnostic**

| <i>Tests</i>              | <i>Statistic</i> | <i>P value</i> | <i>Results</i>               |
|---------------------------|------------------|----------------|------------------------------|
| <i>Serial correlation</i> | <i>1.393</i>     | <i>0.1514</i>  | <i>No serial correlation</i> |
| <i>Normality</i>          | <i>0.906</i>     | <i>0.6355</i>  | <i>Normal distribution</i>   |
| <i>Heteroskedasticity</i> | <i>0.438</i>     | <i>0.7849</i>  | <i>No heteroskedasticity</i> |

*Source: E-Views 12*

*Note: \*\*\*, \*\* and \* represents 1%, 5% and 10% level of significance used in this study.*

The hypothesis predicts a normal distribution, as seen in the table 4.1 above, as well as no serial correlation or conditional heteroskedasticity. The outcomes of this finding are consistent with what the theory expected. Nonetheless, despite the fact that the alternative hypotheses indicate otherwise, serial correlation is not featured the model as has been demonstrated in the null hypothesis, in fact,. The probability of this happening is 0.1514, which is substantially higher than the 0.05% limit and by a factor of 2. In this case, it is deemed that the null hypothesis is accurate, and any thought that the model may show serial correlation is rejected. The model does not demonstrate heteroskedasticity at the 5% significance level as a result of the null hypothesis. Because the significance level is 5, this is the case. This model does not get stuck around the 5% threshold and stagnate after being put through its paces. If the likelihood value of 0.7849 is more than the 0.05 percent threshold, it suggests that the data does exhibit heteroskedasticity. We must conclude that the model does not exhibit heteroskedasticity at this level since the null hypothesis at a significance level of 5% can't be rejected by us. This is the only logical outcome for us. If we accept the null hypothesis, the data set should have a normal distribution between the percentages of 5 and 10%, or someplace in that range. Residue frequency distributions are generally 5% of the total. The Jarque-Bera probability cannot be considered significant since the likelihood of 0.6355 is statistically larger than the 0.05 percent criterion. As a result, the likelihood cannot be considered significant. If the null hypothesis concerning cointegration is correct, then residuals have a normal distribution at the 5% level.



## Pairwise Granger Causality Test

**Table 4.6 Granger Causality Result**

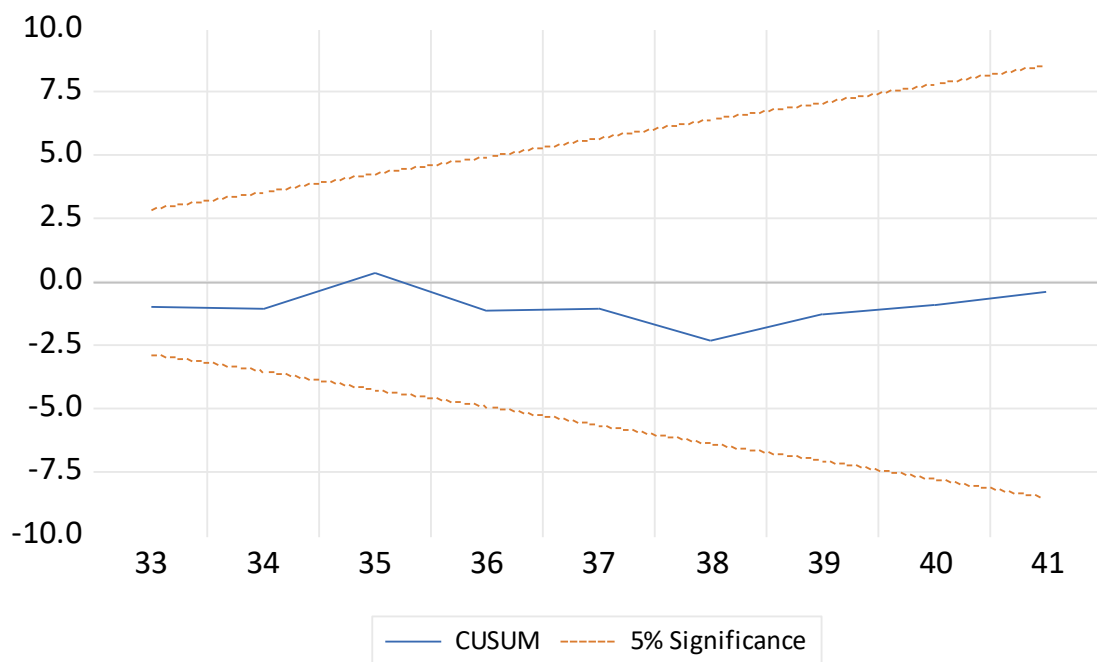
| <b>Null Hypothesis:</b>  | <b>Obs</b> | <b>F-Statistic</b> | <b>Prob.</b>       |
|--|------------|--------------------|--------------------|
| INF does not Granger Cause GDP<br>GDP does not Granger Cause INF   | 39         | 2.14337<br>0.31092 | 0.1328<br>0.7348   |
| REER does not Granger Cause GDP<br>GDP does not Granger Cause REER | 39         | 0.00115<br>10.7888 | 0.9989<br>0.0002** |
| RIR does not Granger Cause GDP<br>GDP does not Granger Cause RIR   | 39         | 0.59759<br>0.35877 | 0.5558<br>0.7011   |
| BM does not Granger Cause GDP<br>GDP does not Granger Cause BM     | 39         | 1.01537<br>0.45987 | 0.3730<br>0.6352   |
| FDI does not Granger Cause GDP<br>GDP does not Granger Cause FDI   | 39         | 0.52479<br>1.59943 | 0.5964<br>0.2168   |
| REER does not Granger Cause INF<br>INF does not Granger Cause REER | 39         | 2.68390<br>3.90769 | 0.0827<br>0.0297** |
| RIR does not Granger Cause INF<br>INF does not Granger Cause RIR   | 39         | 1.78470<br>1.01300 | 0.1832<br>0.3738   |
| BM does not Granger Cause INF<br>INF does not Granger Cause BM     | 39         | 1.99098<br>0.10506 | 0.1522<br>0.9006   |
| FDI does not Granger Cause INF<br>INF does not Granger Cause FDI   | 39         | 8.56525<br>0.09001 | 0.0010**<br>0.9141 |
| RIR does not Granger Cause REER<br>REER does not Granger Cause RIR | 39         | 5.36305<br>1.05683 | 0.0095**<br>0.3587 |
| BM does not Granger Cause REER<br>REER does not Granger Cause BM   | 39         | 0.24368<br>0.10177 | 0.7851<br>0.9035   |
| FDI does not Granger Cause REER<br>REER does not Granger Cause FDI | 39         | 0.10463<br>1.94496 | 0.9009<br>0.1586   |
| BM does not Granger Cause RIR<br>RIR does not Granger Cause BM     | 39         | 1.01639<br>0.12277 | 0.3726<br>0.8849   |
| FDI does not Granger Cause RIR<br>RIR does not Granger Cause FDI   | 39         | 2.60936<br>0.07022 | 0.0883<br>0.9323   |
| FDI does not Granger Cause BM<br>BM does not Granger Cause FDI     | 39         | 0.83117<br>1.26905 | 0.4442<br>0.2941   |

*Source: EViews 12*

Table 4.6 displays the results of the Granger Causality test that was performed with this regression tool. The conventional Granger causality test entails evaluating the null hypotheses that REER does not affect GDP and vice versa, FDI does not affect GDP, the interest rate does not cause GDP, and wide money does not cause FDI. At a 5% level, GDP growth causes the exchange rate to be significant, whereas the exchange rate is not. At the 5% threshold of significance, inflation causes the exchange rate, but the exchange rate does not; hence, the causality is unidirectional. FDI also causes inflation, but inflation does not, and lastly, real interest rates produce a 5% exchange rate, but the exchange rate does not.

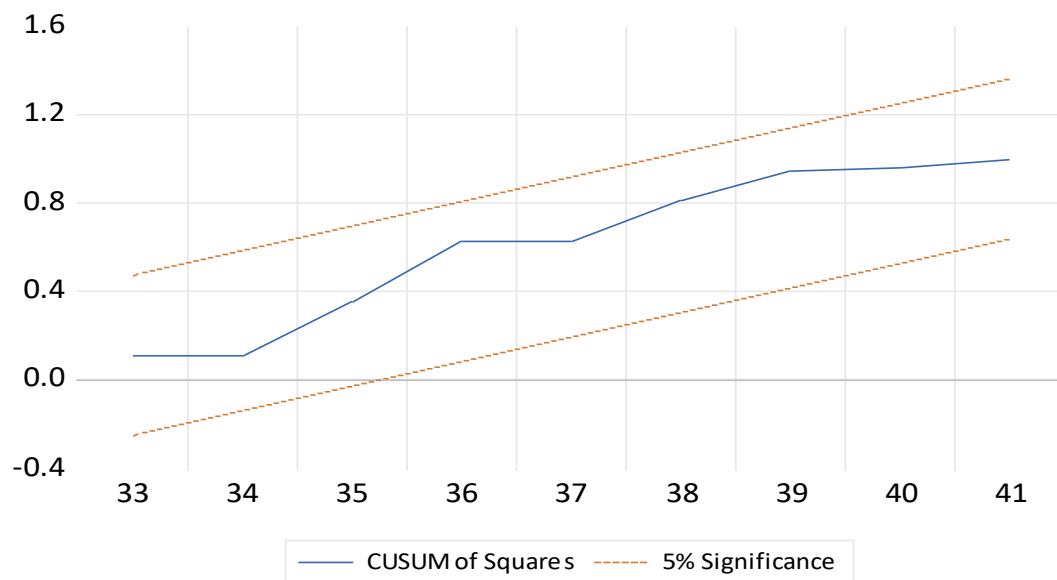
## Cusum and Cusum of Squares Test Results

Figure 4.1 Cusum Results



Source: E-Views 12

Figure 4.2 CUSUM of Squares Results



Source: E-Views 12

**Stability test**

According to the experiment's findings, the red line creates the limitations within which the blue line may be detected, and as a result, the blue line is limited to those bounds. To gain an advantage, as shown in the diagram, we have decided to believe that the residual variances are stable rather than unstable in order to accomplish this purpose. As a consequence, we choose to accept the hypothesis that the null hypothesis is true, whereas we choose to reject the accuracy of the alternative hypothesis. However, contrary to what one would expect based on the statistics, the residual variance is not changing. This is a consistent finding. The cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares (CUSUMQ) were employed to evaluate the consistency of the ARDL model's long-term coefficient with the short-term dynamics of the international tourism and economic development variables. The two methodologies are often referred to as "cumulative sums." Assuming the null hypothesis is valid, all error correction coefficients inside the error correction model should fall within the 5% confidence interval. By Bahmani, Oskooee, and Ng (2002) A 5% significance level can be used to reject the null hypothesis of consistent coefficients if it is shown that any of the lines have been broken. The plot of CUSUM and CUSUMQ data must adhere to the key limits shown in the diagram above. This ensures that the international tourist coefficient remains constant over time.

## **CHAPTER V**

### **OVERVIEW, CONCLUSION AND RECOMMENDATIONS**

#### **Overview**

The effect of exchange rate fluctuation on Nigerian economic growth from 1980 to 2020, is the purpose of this thesis investigation. Currency conversion or exchange rate refers to the percentage difference between two currencies' purchasing and selling values; in essence, it indicates the exchange rate between two currencies (Jhingan, 2018). It also decides on the amount of external sector participation in global exchanges as well as the total costs of local and imported commodities. Interest rate and exchange rate management have remained hot concerns in the worldwide marketplace and among emerging nations, with the former seeing exchange rate progress as critical to economic expansion (Obansa et al., 2018). Since the floating exchange rate system was introduced, currency values have fluctuated significantly and arbitrarily, with no clear link to changes in the underlying macroeconomic fundamentals, and this was after the Bretton Woods agreement broke down in the 1970s. The second major shift occurred in 1973, when Nigeria's currency was changed from the pound to the naira. The allegation of knowledge of self-sufficiency seems to have been overlooked this time, as the transaction was settled in US dollars. The naira declined in value as the value of the dollar fell in 1973. The fall was sustained as a consequence of the dollar's ongoing depreciation. With this in mind, the Nigerian government decided towards the end of 1973 to decouple the naira from its direct peg to either the US dollar or the pound sterling. The naira's monetary system had a surge of activity in 1974–1975 as a result of separation. The oil explosion significantly enhanced this arrangement. Nigeria's currencies were linked to a basket of seven of Nigeria's major trading partners' currencies, including the US and others. The naira was expected to stay constant at first because any loss of incentive caused by the depreciation of one currency in the container would be compensated for by the thankfulness or appreciation of another currency in the container. The method was then employed to mitigate variations in the impacts on local costs and achieve equalization in the outside conversion scale. It is critical to understand that Nigeria collected significant distant stocks as a consequence of the oil effect from around 1973 to late 1977. Official hold exhaustion managed private overflow demand, but there was reticence to downgrade when the saved change turned out to be too little to sustain the fixed exchange rate. The

national bank created an import authorization system to remotely monitor and control international commerce. The issue was that when reserves increased, so did the value of the naira, but the currency could not decrease in value as reserves dropped. As a consequence, it was possible that the existing conversion scale process might be maintained forever by continual publishing on official marketplaces. In this line, tough international trade regulations were enacted. This investigation is quantitative in nature. Quantitative data is based on measuring a certain amount or quantity of a phenomenon. It is concerned with the analysis and collection of numerical data, which may be used to predict occurrences and trends or to identify averages.

It is one of the two fundamental forms of research and is based on numerical data. Tables, facts, and graphs support the conclusion. This approach is widely used in several scientific and field studies. Secondary data is used in this dissertation. Using secondary data allows researchers to quickly and easily utilise a large pool of information from a previously collected source. Many different research institutions pool their resources to gather secondary data for use in large-scale studies. The principal investigator is free to concentrate on whatever aspects of the investigation pique his or her attention. By splitting up the work, scientists can learn more in less time. Secondary data from the Nigerian Central Bank and the World Bank's statistics website were used to analyze the impact of exchange rate fluctuations on Nigeria's economic growth from 1980 to 2020. The databases used by the World Bank are crucial resources for the organization, as they provide vital statistical data used in management decisions. Adherence to globally accepted standards and rules guarantees a reliable and consistent data set. Statistics and data operations of the World Bank are managed by the Development Data Group, which is also responsible for a variety of macro, financial, and sector databases. Everybody who uses the data can have faith in its accuracy and reliability because the group collects, compiles, and distributes it in line with strict standards. It works in close tandem with the bank's other regional and international divisions. Autoregressive distributed lag (ARDL), a technique developed by Pesaran et al., was implemented in this study (2001). The ARDL model is the gold standard in econometrics when there is a stationary at I (0) or integrated in the order I (1) of the independent variables. According to the goals of the research, this model does a better job of capturing the immediate and long-term effects of the independent factors on rice yield. The ARDL methodology makes use of the ordinary least squares (OLS) method for variable

cointegration. Because of this, it is appropriate for obtaining concurrently the elasticities of short-run and long-run for a small sample size (Duasa 2007). You are free to rearrange the sequence in which the variables are incorporated whenever you are working with ARDL. If the model only contains variables that are  $I(0)$ ,  $I(1)$ , or mutually cointegrated, then ARDL can be considered legitimate; however, if the model additionally contains a variable that is  $I(2)$ , then ARDL cannot be considered valid (Frimpong & Oteng 2006). Pesaran et al. (2001) developed the autoregressive distributed lag (ARDL) bound test in order to determine whether or not there is a long-run connection that occurs in sequence. Recent empirical research into the link between climate change and other agricultural factors in a number of countries, including Ghana (Asumadu-Sarkodie & Owusu, 2016), Pakistan (Arshed & Abduqayumov, 2016), and Europe, has seen a rise in the use of the ARDL approach, thanks to its usefulness in identifying long- and short-run relationships among variables (Acaravci & Ozturk 2010). The ARDL is frequently used for discovering variable integrations, and it works particularly well with sparse data. The goal of this study was to use the ARDL model to analyze the effects of climatic factors, technological considerations, and agricultural policy from 1990 on rice yields in Korea. The study will also provide suggestions based on the findings. We use the Schwarz Bayesia Criterion and the Akaike Information Criterion (AIC) to determine the best latency (SBC). Consult Narayan's (2005) critical limits for small sample sizes; Pesaran et al (2001). All of the variables utilized in this thesis are stable, as shown in Table 4.1, which provides the ARDL findings of the unit root test. According to the data in the table above, inflation, FDI, and the real interest rate are all stationary at p-values of 0.0000, 0.0027, and 0.006. At the first difference, three out of the six variables (money supply, real effective exchange rate, and GDP growth) are stationary (p 0.0000 for all three). When dealing with static data, the ARDL model was chosen since it provided the best match. The results of the ARDL bound test, which was performed to analyze the consistency of the data across time, are shown in Table 4.2. Research variables are likely related over the long run if the estimated F-statistics value of 8.112348 is larger than the cutoff value at the 5% level of significance. The outcomes of both the short- and long-term ARDL tests are shown in Table 4.3. They show that there's a strong correlation between the explanatory and response variables over the course of time.

According to the statistics, there is a significant inverse relationship between the exchange rate and the expansion of the Nigerian economy. More specifically, a one percent increase in the exchange rate results in a reduction of 0.030 percentage points in long-term growth and 0.027 percentage points in short-term growth. Obansa, Okoroafor, Aluko, and Eze conducted an experiment to confirm the link between the interest rate, the exchange rate, and economic growth in the Nigerian economy from 1970 to 2010. Our findings are consistent with theirs. The time frame under consideration can be conceptually divided into the regulated and deregulate eras, respectively, in order to facilitate analysis. The impulse response part and the dissection of the prediction error's variance were the main points of this study's use of the vector auto-regression (VAR) method. More so than interest rates, the exchange rate appeared to affect economic growth. There was a beneficial impact from interest rates in particular, although it was demonstrated to diminish over longer investment horizons. This meant that it had less of an impact on economic growth before deregulation than it did afterward. The study concluded that liberalizing Nigeria's exchange rate led to faster economic expansion. However, since interest rate liberalization diminishes the incentive to invest, it has a small effect on GDP growth. The study's authors argue that this justifies a return to the more stringent monetary policy of the 1970s and 1980s. On top of that, there is an inverse relationship between the expansion of the Nigerian money supply and the development of the country's economy. These results lend credence to Omodero's (2019) main conclusion that the study is investigating the impact of monetary expansion on economic growth in Nigeria and Ghana. The primary objectives of this study are to compare and contrast the impact of Nigeria's and Ghana's respective monetary systems on economic growth. Using conventional least squares regression, we look at the years 2009 through 2018. According to the data, wide money supply (M2) has a moderately negative effect on RGDP in Nigeria but a substantial beneficial effect in Ghana. In both Nigeria and Ghana, the broad money supply (M3) has a considerable negative influence on real gross domestic product (RGDP), whereas credit to the private sector (CPS) has a small positive effect. The study recommends, among other things, that the central banks of the two countries create monetary policy strategies that will help drive the economy more effectively, and that these policies give more weight to M2 and CPS because of the roles they play in economic expansion, which in turn boosts output and employment. The growth of

Nigeria's economy has been stunted by a number of factors, including foreign direct investment and inflation. Using the ordinary least square (OLS) approach, based on an econometric model, Muritala (2011) reached similar results on the impact of inflation and investment on economic growth performance in Nigeria between 1981 and 2006. The coefficient of the inflation is statistically significant at 10%, and is negative while the GCF coefficient is positive and significant at 1%; these findings are consistent with a long-term relationship being established among investment, inflation, and GDP growth through the regression analysis. This means that for every one percent increase in inflation, the economy loses 0.9% of its output (RGDP). As a result, inflation and RGDP are inversely related. GCF and RGDP (economic performance) have a positive association, with a 1% change in GCF resulting in a 0.3%-unit gain in economic performance. Increased investment would boost consumption, labor, productivity, and production, all of which would boost economic performance by reducing capital flight. Both supply-side and demand-side actions, such as reducing the real wide money supply, may be supported to reduce inflation in the short and long term. Furthermore, Saqib, Masnoon, and Rafique (2013) investigate the impact of foreign direct investment on the economy of the host nation, and we utilize Pakistan to examine the alleged relationship. The information used in this study was gathered between 1981 and 2010. Aside from FDI, the research incorporates four more variables to regress on the country's GDP: debt, trade, inflation, and local investment. The least-squares method was used to investigate the bearing of these variables on Pakistan's economy. To determine the co-integration of the variables, the Augmented Dickey-Fuller Test was used, which, in the long run, was verified to be valid. Statistics, Foreign investment has a negative influence on Pakistan's economic performance, but domestic investment has a beneficial impact. Furthermore, the country's debt, trade, and inflation have all been shown to have a negative impact on GDP. The ECM value in this thesis reflects the rate at which the dependent variable adapts from the short to the long run. The rate of change at which this update may be implemented is 26%. As seen in Table 4.1, the hypothesis predicts a normal distribution with no serial correlation or conditional heteroskedasticity. The results of this discovery are consistent with what the theory predicted. Nonetheless, despite the fact that the alternative hypotheses suggest otherwise, as shown by the null hypothesis, the model lacks serial correlation. The likelihood of this occurring is 0.1514, which is much more than the 0.05% limit by a



factor of two. In this situation, the null hypothesis is considered correct, and any notion that the model may exhibit serial correlation is disregarded. At the 5% significance level, the model does not exhibit heteroskedasticity as a consequence of the null hypothesis. This is because the significance level is set to 5. After being put through its paces, this model does not get stuck around the 5% level and stagnate. If the value of the probability of 0.7849 is greater than the 0.05 percent cutoff, it indicates that the data exhibits heteroskedasticity. Because the null hypothesis at a significance level of 5% can't be rejected by us, we must infer that the model does not show heteroskedasticity at this level. For us, this is the only logical consequence. If we accept the null hypothesis, there should be a normal distribution of the data set with a percentage range of 5–10%, or something close to that. Residue frequency distributions account for around 5% of the total. Because the chance of 0.6355 is statistically greater than the 0.05 percent criteria, the Jarque-Bera probability cannot be declared significant. As a consequence, the possibility is not deemed substantial. At the 5% level, residuals exhibit a normal distribution if the null hypothesis about cointegration is valid. According to the results of the experiment, the red line defines the boundaries within which the blue line may be identified, and so the blue line is confined to those boundaries. In order to obtain an advantage, as illustrated in the figure, we have opted to think that the residual variances are stable rather than unstable. While rejecting the hypothesis that the alternative hypothesis is correct, we, therefore, take the view that the null hypothesis is valid. However, contrary to what statistics would suggest, the residual variance is not changing. This is a recurring observation. The cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares (CUSUMQ) were used to examine the long-term stability of the ARDL model's long-term coefficient with the short-term dynamics of the international tourism and economic development variables. Both of these methods are referred to as "cumulative sums." The null hypothesis says that, within a 5% confidence range, in the error correction model there is no variation in any of the error correction coefficients. Ng, Bahmani, and Oskooee (2002) If any of the lines is shown to be crossed, the null hypothesis of consistent coefficients may be rejected at 5% significance. The CUSUM and CUSUMQ data displays must comply with the essential restrictions shown in the picture above. This keeps the international tourist coefficient constant throughout time. Monetary policy in a small nation becomes unproductive with a fixed exchange rate and highly mobile capital.

## Conclusion

The objective of this thesis is to look at the impact of exchange rate fluctuations on the Nigerian economic growth from 1980 to 2020. Currency conversion or exchange rate refers to the percentage difference between the purchase and selling prices of two currencies; in essence, it represents the exchange rate between two currencies (Jhingan, 2018). In light of this, interest in the currency rate has increased. Following the Bretton Woods system in the 1960s, Nigeria maintained a fixed exchange rate until the 1970s. However, the exchange rate has been floating since 1980, and notably since 1986. Since the implementation of the floating foreign exchange determination system, currency rates have benefited its rivals over Nigeria. While uncivilized conversion scales or reliable variations have remained a significant deterrent to Nigeria's and many other African countries' financial growth, a swapping scale (whether privilege or legitimate) has used financial development as one if not the most important elements of most developed countries economies. The research here used a method called autoregressive distributed lag (ARDL), which was created by Pesaran et al (2001). When the independent variables are I (0) stationary or I integrable, the ARDL model is the most accurate econometric specification (1). The goals of the study were met since this model more accurately captures the short- and long-term effects of the independent factors on rice yield. The ARDL technique uses ordinary least squares (OLS) for variable cointegration to provide short-run and long-run elasticities for a small sample size (Duasa 2007). The independent variables in an ARDL model can have a variety of integration sequences including I(0), I(1), and mutually cointegrated (Frimpong & Oteng, 2006), but ARDL cannot handle the circumstance where one or more of the variables are I(2) (2). To uncover the time-series link, Pesaran et al. (2001) designed the autoregressive distributed lag (ARDL) bound test. ARDL is particularly well-suited to identifying long- and short-run relationships among variables, and it has recently gained popularity in some empirical studies for examining the connection between climate change and other agricultural factors in a number of countries, including Ghana (Asumadu-Sarkodie & Owusu, 2016), Pakistan (Arshed & Abduqayumov, 2016), and Europe (Acaravci & Ozturk 2010). The ARDL is frequently used for discovering variable integrations, and it works particularly well with sparse data. Consequently, the objective of this study was to make use of the ARDL model in order to investigate the effects, both short-term and long-term, of various climatic variables, technical factors, and

agricultural policy (1990) on the rice production in the Republic of Korea. Furthermore, the study will offer recommendations based on the collected data. Both the Akaike Information Criterion (AIC) and the Schwarz Bayesia Criterion are used to find the optimal latency (SBC). For small sample sizes, check Narayan's (2005) critical limits; Pesaran et al (2001) should be consulted for large sample sizes. The ARDL bound test, performed to determine the stability of the relationship between the variables, is summarized in Table 3.1. With an estimated F-statistics value of 8.112348, which is greater than the upper limit value at the 5% level of significance, it may be concluded that the variables in the research are associated over the long run. The outcomes of both the short- and long-term ARDL tests are shown in Table 4.1. They show that there's a strong correlation between the explanatory and response variables over the course of time.

Statistically, with a one percent rise in the exchange rate reducing long-term growth by 0.030 percentage points and short-term growth by 0.027 percentage points, there is a significant negative association between the economic growth of Nigeria and the exchange rate. This study results are consistent with those of Obansa, Okoroafor, Aluko, and Eze, who sought to experimentally verify the connection between the Nigerian economy's, interest rate, economic growth, and exchange rate from 1970 to 2010. It's helpful to think of the time period under study as being split into two distinct economic epochs: the regulated and the deregulate periods. This research utilized the vector auto-regression (VAR) technique, with a focus on the impulse response component and the variance breakdown of the prediction error. Evidence suggested that the exchange rate was more influential on economic expansion than interest rates. In particular, there were positive effect shown by interest rates, however this benefit eroded with longer investment horizons. As a result, its effect on economic growth was smaller during the regulatory era than it was during the deregulation era. The study found that economic growth increased when the exchange rate in Nigeria was liberalized. Since it reduces the incentive to invest, Interest rate liberalization, on the other hand, has a negligible impact on GDP growth. Because of this, the study authors suggest reverting to the restrictive interest rate policy of the 1970s and 1980s. Moreover, the correlation that broad money has on the Nigerian economy growth is negative. Omodero's (2019) conclusion that the study is examining the effect of money supply on economic growth in Nigeria and Ghana is supported by these findings. The effects of the money supply systems

examination in both Nigeria and Ghana on economic expansion are the primary goals of this study. Examining data from 2009–2018 with ordinary least squares regression. According to the data, broad money supply (M2) has significantly favorable effect on RGDP in Ghana but a moderately negative effect on RGDP in Nigeria. Broad money supply (M3) has a significantly negative influence on real gross domestic product (RGDP) in Ghana, while credit to the private sector (CPS) has a moderately positive effect in both Nigeria and Ghana. The study recommends, among other things, that in order to help drive the economy more effectively, the central banks of the two countries should create monetary policy strategies, and that these policies give more weight to M2 and CPS because of the roles they play in economic expansion, which in turn boosts output and employment. The growth of Nigeria's economy has been stunted by a number of factors, including foreign direct investment and inflation. Based on the ordinary least square (OLS) approach using an econometric model, Muritala (2011) reached similar results on the impact of investment and inflation on Nigeria's economic growth performance between 1981 and 2006. The coefficient of inflation is negative and statistically significant at 10%, while the GCF coefficient significant at 1% and is positive; these findings are consistent with a long-term relationship being established among investment, inflation, and GDP growth through the regression analysis. This means that for every one percent increase in inflation, the economy loses 0.9% of its output (RGDP). Therefore, there is a negative correlation between RGDP and inflation. While GCF and RGDP (economic performance) has a positive correlation, such that a 1% change in GCF results in a 0.3% unit gain in economic performance. Capital flight can be reduced if businesses spend more in their operations, which will increase consumption, employment, productivity, and output. Short- and long-term efforts to curb inflation may benefit from supply- and demand-side measures alike, such as cutting back on the real wide money supply. Moreover, we use Pakistan to analyze the purported association between FDI and the host country's economy like Saqib, Masnoon, and Rafique (2013) do in their research. From 1981 to 2010, researchers gathered the data used in this analysis. In addition to foreign direct investment, the research includes the effects of debt, inflation, trade, and domestic investment on GDP. Pakistan's economic performance was studied by analyzing the least-squares effect of various factors. To analyze the variables for cointegration, and its validity, in the long run, was confirmed, the Augmented Dickey-Fuller Test was used.

Statistics show that the economic performance of Pakistan has been detrimentally affected by foreign investment, while domestic investment has a positive effect. It has also been demonstrated that the country's debt, trade, and inflation all have a deleterious effect on GDP. This thesis's ECM value signifies the rate of change from the short to long run of the dependent variable.

The rate of change at which this update may be implemented is 26%.

However, in companies that use fixed conversion scales, the emphasis of cash-related processes will shift away from outward parity and toward internal stability. Furthermore, because of the quick movement of capital and the flawless substitutability of domestic and foreign assets, the financial strategy becomes entirely focused on the exchange scale equality obstacle.

### **Recommendations**

Given this, there is a need to reform Nigeria's current currency rate control structure. This can have an effect on the pace of income growth, but only as part of a broader economic change that includes complementing monetary policy. Nigeria urgently needs to diversify its product and export options in order to become a provider rather than a taker in the worldwide market. This study also advises that future research look at the link between international investment, foreign direct investment, exports of products and services in the capital market of Nigeria, and currency rate changes in Nigeria. The government ought to support export promotion tactics in order to sustain a trade surplus, as well as create a favorable climate, competent fiscal and monetary policies, enough security, and infrastructure facilities to entice international investors to invest in Nigeria. We believe interest rates should be controlled.

This conclusion, however, contradicts the results of Mckinnon and Shaw (1973), who found that liberalization of interest rates contributes to economic growth and financial sector expansion in both developing and developed nations. The authors of this publication urge researchers in both developed and developing nations to expand their studies where interest rates and exchange rates are important to economic growth.

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## Appendices

### Appendix 1 Descriptive Statistics

|              | GDP       | INF      | REER     | RIR       | BM       | FDI       |
|--------------|-----------|----------|----------|-----------|----------|-----------|
| Mean         | 3.055069  | 21.44787 | 151.3957 | 0.337111  | 16.66516 | 1.435467  |
| Median       | 4.195924  | 11.11892 | 100.5760 | 4.310292  | 13.52700 | 1.093559  |
| Maximum      | 15.32916  | 219.0028 | 536.8903 | 18.18000  | 28.62522 | 5.790847  |
| Minimum      | -13.12788 | 0.686099 | 49.74471 | -65.85715 | 9.063329 | -1.150856 |
| Std. Dev.    | 5.387712  | 34.70035 | 117.7697 | 14.27219  | 6.109432 | 1.297427  |
| Skewness     | -0.825581 | 4.745691 | 1.784395 | -2.685826 | 0.554389 | 1.419837  |
| Kurtosis     | 4.621278  | 27.10318 | 5.414266 | 12.77500  | 1.691710 | 5.698300  |
| Jarque-Bera  | 9.147918  | 1146.376 | 31.71512 | 212.5258  | 5.024230 | 26.21364  |
| Probability  | 0.010317  | 0.000000 | 0.000000 | 0.000000  | 0.081097 | 0.000002  |
| Sum          | 125.2578  | 879.3628 | 6207.224 | 13.82156  | 683.2715 | 58.85415  |
| Sum Sq. Dev. | 1161.097  | 48164.58 | 554788.1 | 8147.812  | 1493.006 | 67.33268  |
| Observations | 41        | 41       | 41       | 41        | 41       | 41        |

### Appendix 2 Unit root

#### BM

Null Hypothesis: BM has a unit root

Exogenous: Constant

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

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.249241   | 0.1930 |
| Test critical values:                  |             |        |
| 1% level                               | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

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

Null Hypothesis: D(BM) has a unit root

Exogenous: Constant

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

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -9.232092   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.610453   |        |
| 5% level                               | -2.938987   |        |
| 10% level                              | -2.607932   |        |

**REER**

Null Hypothesis: REER has a unit root

Exogenous: Constant

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

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.943375   | 0.3098 |
| Test critical values: 1% level         | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

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

Null Hypothesis: D(REER) has a unit root

Exogenous: Constant

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

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.366347   | 0.0013 |
| Test critical values: 1% level         | -3.610453   |        |
| 5% level                               | -2.938987   |        |
| 10% level                              | -2.607932   |        |

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

**INF**

Null Hypothesis: INF has a unit root

Exogenous: Constant

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

|  | t-Statistic | Prob.* |
|--|-------------|--------|
| Augmented Dickey-Fuller test statistic | -5.880719   | 0.0000 |
| Test critical values: 1% level         | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

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

**GDP**

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> | -2.697845   | 0.0835 |
| Test critical values:                         |             |        |
| 1% level                                      | -3.610453   |        |
| 5% level                                      | -2.938987   |        |
| 10% level                                     | -2.607932   |        |

\*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> | -11.64287   | 0.0000 |
| Test critical values:                         |             |        |
| 1% level                                      | -3.610453   |        |
| 5% level                                      | -2.938987   |        |
| 10% level                                     | -2.607932   |        |

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

**FDI**

Null Hypothesis: FDI 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> | -4.097891   | 0.0027 |
| Test critical values:                         |             |        |
| 1% level                                      | -3.605593   |        |
| 5% level                                      | -2.936942   |        |
| 10% level                                     | -2.606857   |        |

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

**RIR**

Null Hypothesis: RIR 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> | -4.618599   | 0.0006 |
| Test critical values:                         |             |        |
| 1% level                                      | -3.605593   |        |
| 5% level                                      | -2.936942   |        |
| 10% level                                     | -2.606857   |        |

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

**Appendix 3 ARDL BOUND TEST**

| F-Bounds Test      |          | Null Hypothesis: No levels relationship |      |      |
|--------------------|----------|---|------|------|
| Test Statistic     | Value    | Signif.                                 | I(0) | I(1) |
| Asymptotic: n=1000 |          |   |      |      |
| F-statistic        | 8.112348 | 10%                                     | 2.08 | 3    |
| k                  | 5        | 5%                                      | 2.39 | 3.38 |
|                    |          | 2.5%                                    | 2.7  | 3.73 |
|                    |          | 1%                                      | 3.06 | 4.15 |

**Appendix 4 ARDL LONG RUN**

ARDL Long Run Form and Bounds Test

Dependent Variable: D(GDP)

Selected Model: ARDL(2, 4, 4, 4, 4, 4)

Case 2: Restricted Constant and No Trend

Date: 11/18/22 Time: 16:38

Sample: 1 41

Included observations: 37

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**Conditional Error Correction Regression**


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| Variable    | Coefficient | Std. Error | t-Statistic | Prob.  |
|-------------|-------------|------------|-------------|--------|
| C           | 1.764380    | 6.174618   | 0.285747    | 0.7815 |
| GDP(-1)*    | -0.262701   | 0.223669   | -1.174507   | 0.2703 |
| REER(-1)    | -0.010469   | 0.010007   | -1.046186   | 0.3228 |
| INF(-1)     | 0.240857    | 0.177476   | 1.357124    | 0.2078 |
| RIR(-1)     | 0.421041    | 0.184182   | 2.286006    | 0.0481 |
| BM(-1)      | -0.301240   | 0.139215   | -2.163846   | 0.0587 |
| FDI(-1)     | -0.516964   | 1.003336   | -0.515245   | 0.6188 |
| D(GDP(-1))  | -0.566505   | 0.128488   | -4.409004   | 0.0017 |
| D(REER)     | -0.027465   | 0.012500   | -2.197080   | 0.0556 |
| D(REER(-1)) | -0.030540   | 0.008337   | -3.663127   | 0.0052 |
| D(REER(-2)) | -0.004183   | 0.005948   | -0.703250   | 0.4997 |
| D(REER(-3)) | -0.035751   | 0.007469   | -4.786690   | 0.0010 |
| D(INF)      | -0.034083   | 0.112153   | -0.303901   | 0.7681 |
| D(INF(-1))  | -0.309268   | 0.144414   | -2.141531   | 0.0609 |
| D(INF(-2))  | -0.440594   | 0.070495   | -6.250017   | 0.0001 |
| D(INF(-3))  | -0.258859   | 0.036761   | -7.041619   | 0.0001 |
| D(RIR)      | 0.070629    | 0.150306   | 0.469901    | 0.6496 |
| D(RIR(-1))  | -0.480344   | 0.167642   | -2.865293   | 0.0186 |
| D(RIR(-2))  | -0.705441   | 0.099588   | -7.083610   | 0.0001 |
| D(RIR(-3))  | -0.512414   | 0.075674   | -6.771349   | 0.0001 |
| D(BM)       | -0.243694   | 0.160481   | -1.518521   | 0.1632 |
| D(BM(-1))   | 0.650892    | 0.151463   | 4.297363    | 0.0020 |
| D(BM(-2))   | 0.736893    | 0.152072   | 4.845689    | 0.0009 |
| D(BM(-3))   | 0.561872    | 0.148635   | 3.780204    | 0.0043 |
| D(FDI)      | -2.245084   | 0.421584   | -5.325359   | 0.0005 |
| D(FDI(-1))  | -1.841889   | 0.629416   | -2.926348   | 0.0169 |
| D(FDI(-2))  | -1.278863   | 0.517836   | -2.469630   | 0.0356 |
| D(FDI(-3))  | -0.543665   | 0.339322   | -1.602211   | 0.1436 |

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**Appendix 5 ARDL SHORT RUN**

ARDL Error Correction Regression

Dependent Variable: D(GDP)

Selected Model: ARDL(2, 4, 4, 4, 4, 4)

Case 2: Restricted Constant and No Trend

Date: 11/18/22 Time: 16:41

Sample: 1 41

Included observations: 37

ECM Regression  
Case 2: Restricted Constant and No Trend

| Variable     | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------|-------------|------------|-------------|--------|
| D(GDP(-1))   | -0.566505   | 0.046315   | -12.23155   | 0.0000 |
| D(REER)      | -0.027465   | 0.005441   | -5.047478   | 0.0007 |
| D(REER(-1))  | -0.030540   | 0.003552   | -8.598900   | 0.0000 |
| D(REER(-2))  | -0.004183   | 0.003358   | -1.245540   | 0.2444 |
| D(REER(-3))  | -0.035751   | 0.004335   | -8.246748   | 0.0000 |
| D(INF)       | -0.034083   | 0.072837   | -0.467943   | 0.6509 |
| D(INF(-1))   | -0.309268   | 0.079868   | -3.872216   | 0.0038 |
| D(INF(-2))   | -0.440594   | 0.032513   | -13.55126   | 0.0000 |
| D(INF(-3))   | -0.258859   | 0.017237   | -15.01727   | 0.0000 |
| D(RIR)       | 0.070629    | 0.093652   | 0.754164    | 0.4700 |
| D(RIR(-1))   | -0.480344   | 0.112014   | -4.288234   | 0.0020 |
| D(RIR(-2))   | -0.705441   | 0.063247   | -11.15369   | 0.0000 |
| D(RIR(-3))   | -0.512414   | 0.048280   | -10.61346   | 0.0000 |
| D(BM)        | -0.243694   | 0.085952   | -2.835239   | 0.0196 |
| D(BM(-1))    | 0.650892    | 0.101454   | 6.415641    | 0.0001 |
| D(BM(-2))    | 0.736893    | 0.099933   | 7.373858    | 0.0000 |
| D(BM(-3))    | 0.561872    | 0.103110   | 5.449255    | 0.0004 |
| D(FDI)       | -2.245084   | 0.237975   | -9.434106   | 0.0000 |
| D(FDI(-1))   | -1.841889   | 0.223396   | -8.244933   | 0.0000 |
| D(FDI(-2))   | -1.278863   | 0.260197   | -4.914978   | 0.0008 |
| D(FDI(-3))   | -0.543665   | 0.217173   | -2.503375   | 0.0337 |
| CointEq(-1)* | -0.262701   | 0.027003   | -9.728518   | 0.0000 |

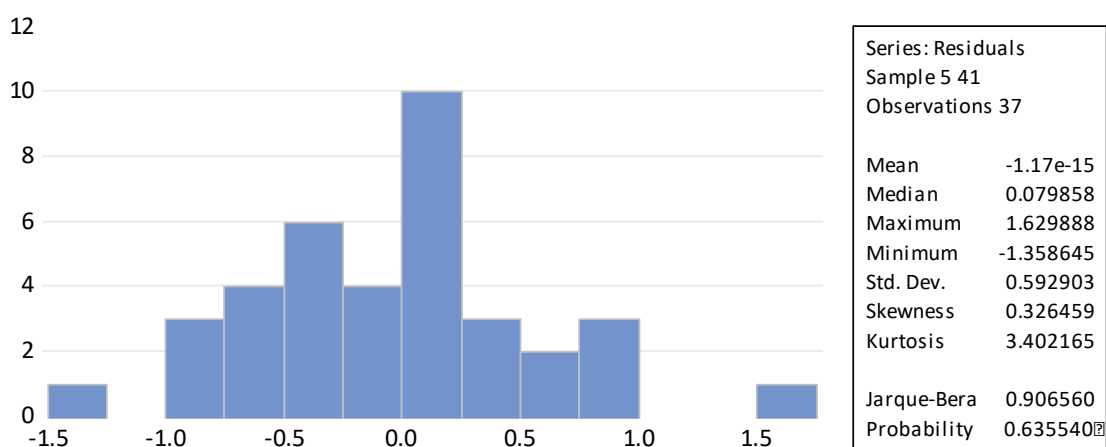
## Appendix 6 RESIDUAL DIAGNOSTIC TEST

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

|               |          |                     |        |
|---------------|----------|---------------------|--------|
| F-statistic   | 1.393289 | Prob. F(2,26)       | 0.2662 |
| Obs*R-squared | 3.775249 | Prob. Chi-Square(2) | 0.1514 |

## Appendix 7 NORMALITY TEST



## Appendix 8 HETEROSKEDASTICITY

Heteroskedasticity Test: Breusch-Pagan-Godfrey

Null hypothesis: Homoskedasticity

|                     |          |                      |        |
|---------------------|----------|----------------------|--------|
| F-statistic         | 0.438941 | Prob. F(27,9)        | 0.9525 |
| Obs*R-squared       | 21.02985 | Prob. Chi-Square(27) | 0.7849 |
| Scaled explained SS | 1.494481 | Prob. Chi-Square(27) | 1.0000 |



## Appendix 9 Granger Causality Test Result

Pairwise Granger Causality Tests

Date: 12/09/22 Time: 18:46

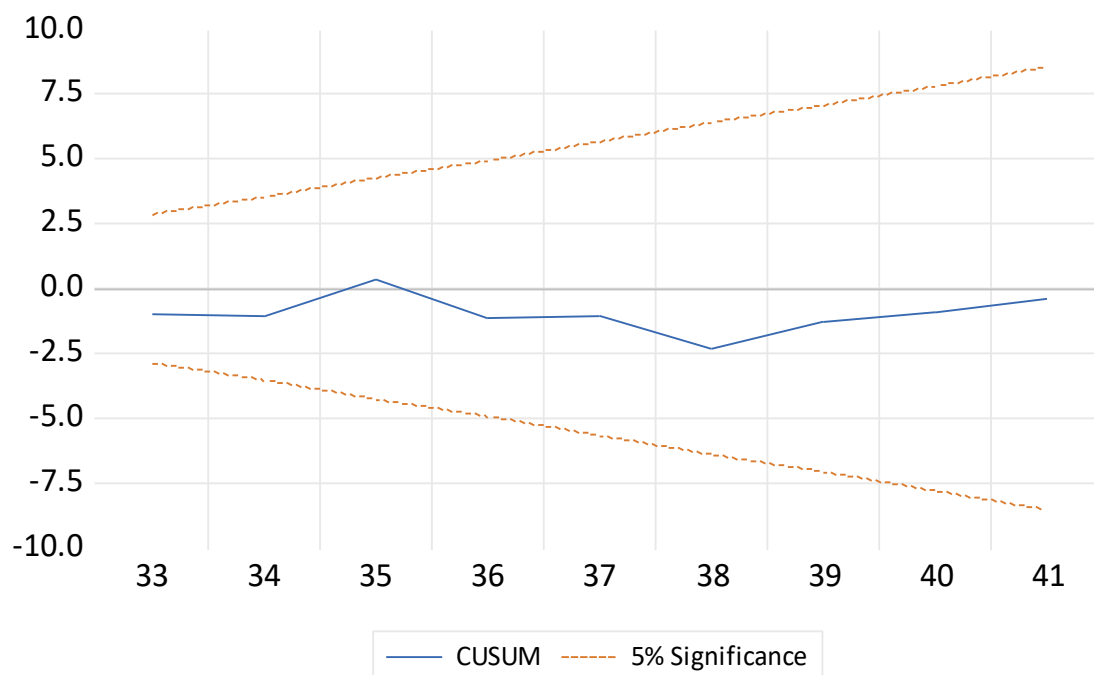
Sample: 1 41

Lags: 2

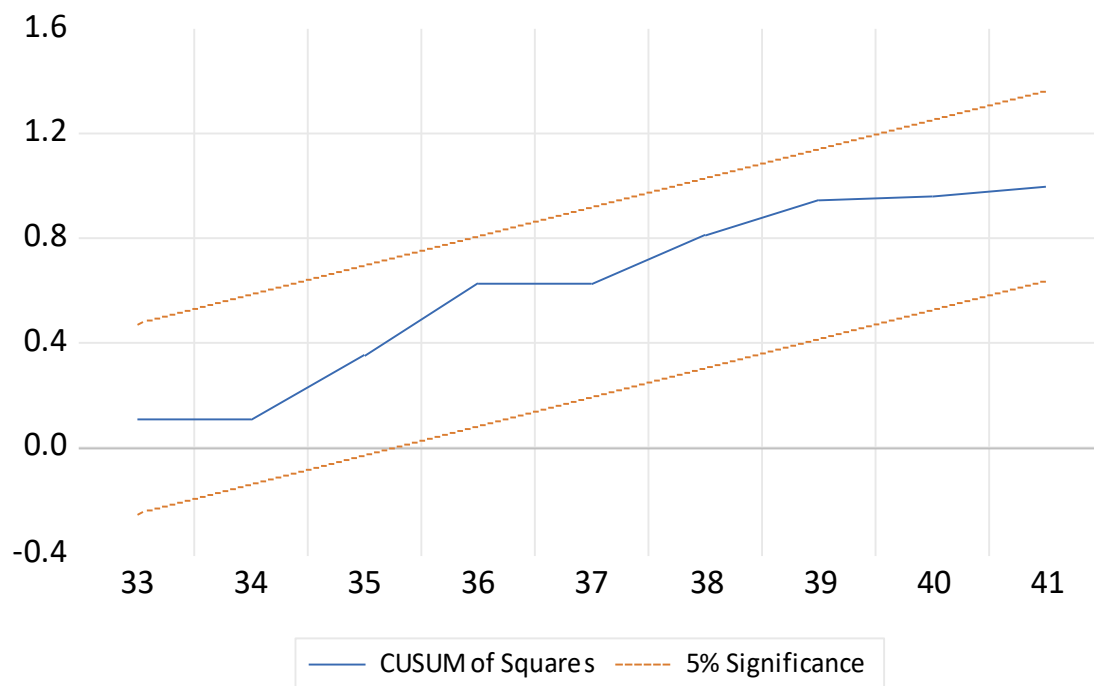
| Null Hypothesis:                | Obs | F-Statistic | Prob.  |
|---------------------------------|-----|-------------|--------|
| INF does not Granger Cause GDP  | 39  | 2.14337     | 0.1328 |
| GDP does not Granger Cause INF  |     | 0.31092     | 0.7348 |
| REER does not Granger Cause GDP | 39  | 0.00115     | 0.9989 |
| GDP does not Granger Cause REER |     | 10.7888     | 0.0002 |
| RIR does not Granger Cause GDP  | 39  | 0.59759     | 0.5558 |
| GDP does not Granger Cause RIR  |     | 0.35877     | 0.7011 |
| BM does not Granger Cause GDP   | 39  | 1.01537     | 0.3730 |
| GDP does not Granger Cause BM   |     | 0.45987     | 0.6352 |
| FDI does not Granger Cause GDP  | 39  | 0.52479     | 0.5964 |
| GDP does not Granger Cause FDI  |     | 1.59943     | 0.2168 |
| REER does not Granger Cause INF | 39  | 2.68390     | 0.0827 |
| INF does not Granger Cause REER |     | 3.90769     | 0.0297 |
| RIR does not Granger Cause INF  | 39  | 1.78470     | 0.1832 |
| INF does not Granger Cause RIR  |     | 1.01300     | 0.3738 |
| BM does not Granger Cause INF   | 39  | 1.99098     | 0.1522 |
| INF does not Granger Cause BM   |     | 0.10506     | 0.9006 |
| FDI does not Granger Cause INF  | 39  | 8.56525     | 0.0010 |
| INF does not Granger Cause FDI  |     | 0.09001     | 0.9141 |
| RIR does not Granger Cause REER | 39  | 5.36305     | 0.0095 |
| REER does not Granger Cause RIR |     | 1.05683     | 0.3587 |
| BM does not Granger Cause REER  | 39  | 0.24368     | 0.7851 |
| REER does not Granger Cause BM  |     | 0.10177     | 0.9035 |
| FDI does not Granger Cause REER | 39  | 0.10463     | 0.9009 |
| REER does not Granger Cause FDI |     | 1.94496     | 0.1586 |
| BM does not Granger Cause RIR   | 39  | 1.01639     | 0.3726 |
| RIR does not Granger Cause BM   |     | 0.12277     | 0.8849 |
| FDI does not Granger Cause RIR  | 39  | 2.60936     | 0.0883 |
| RIR does not Granger Cause FDI  |     | 0.07022     | 0.9323 |
| FDI does not Granger Cause BM   | 39  | 0.83117     | 0.4442 |
| BM does not Granger Cause FDI   |     | 1.26905     | 0.2941 |

## Appendix 10 STABILITY TEST

### CUSUM test Results



### CUSUM of Squares test Results



**Appendix 11**  
**Turnitin Similarity Report**

## ARCHIE\_ROOSEVELT MARTU

### ORIGINALITY REPORT

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