NEAR EAST UNIVERSITY

INSTITUTE GRADUATE STUDIES

DEPARTMENT OF BANKING AND FINANCE

ANALYSING CAUSALITY BETWEEN EXCHANGE RATE AND

ECONOMIC GROWTH IN SOUTH AFRICA (1980-2020)

MSc. THESIS

JOHN KOLLEH WEETOR

Nicosia

JUNE, 2023

NEAR EAST UNIVERSITY

INSTITUTE OF GRADUATE STUDIES

DEPARTMENT OF BANKING AND FINANCE

ANALYSING CAUSALITY BETWEEN EXCHANGE RATE AND

ECONOMIC GROWTH IN SOUTH AFRICA (1980-2020)

MSc. THESIS

JOHN KOLLEH WEETOR

Supervisor

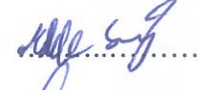**Prof. Dr. Turgut Tursoy**

Chairman Banking and Finance Department.

Nicosia

JUNE,2023

Approval

After a careful scrutiny of the thesis titled "**Analyzing causality between exchange rate and economic growth in South Africa (1980-2020)** submitted by **JOHN KOLLEH WEETOR**. It has met the unanimous consensus and in our combined opinion, it is fully adequate, in scope and in quality, as a thesis for the degree of MasterEducational Sciences, and hereby recommended for approval and acceptance.

Examining Committee	Name-Surname	Signature
Head of the Committee:	Prof. Dr. Turgut Tursoy	
Committee Member*:	Assoc. Prof. Dr. Mehdi Seraj	
Committee Member*:	Asst. Prof. Dr. Ala Fathi Assi	
Supervisor:	Prof. Dr. Turgut Tursoy	

Approved by the Head of the Department

16 / 5 /20 23

Prof. Dr. Turgut Tursoy

Head of Department

Approved by the Institute of Graduate Studies

…..../…..../20…

Prof. Dr. Kemal Hüsnü Can Başer

Head of the Institute

Declaration

I hereby declare that all information presented in this thesis titled "**Analyzing causality between exchange rate and economic growth in South Africa (1980-2020)**" was gathered, analyzed, and tailored in accordance with all academic rules and ethical guidelines established by the Institute of Graduate School, Near East University. I further declare that, to the best of my abilities, any supplementary resources utilized in the creation of this thesis are adequately credited, acknowledged, and referenced.

JOHN KOLLEH WEETOR

…..../06/2023

Acknowledgment

Abstracts

ANALYSING CAUSALITY BETWEEN EXCHANGE RATE AND

ECONOMIC GROWTH IN SOUTH AFRICA (1980-2020)

JOHN KOLLEH WEETOR
MSc. BANKING AND FINANCIAL
June 2023 Page,125

The goal of this thesis is to examine how South Africa's economy has grown, how inflation has changed, how the stock market has grown, and how currency rates have changed between 1980 and 2020. Real exchange rates are the prices of imported goods compared to the prices of domestic goods. They are important because they show how competitive a country is on the world stage and how long-term changes affect different industries. You can figure out what the real exchange rate is if you compare the prices of products created in your own country to the prices of goods made in other nations. This will give you a decent idea of what the exchange rate actually is. In order to execute the linear regression that was necessary for this thesis, both the ARDL model and the Granger causality method were used. Both of these approaches were quite helpful. The outcomes of the study indicate that growth in the stock market, variations in the currency, and changes in interest rates would all be beneficial to the economy of South Africa; nevertheless, inflation would be detrimental to the economy. Exchange rates are very important to the economy of the whole world because they affect the amount of money that may be lent to or deposited in another nation. The South African government must take a diversity of actions to ensure that the nation will continue to be politically stable, that enough infrastructure will be created, and that a sound macroeconomic plan will keep interest rates and foreign currencies steady. Recent growth in South Africa's GDP may be a sign that foreign investors are becoming more optimistic about that country's economy's resilience and ability to withstand the current global economic crisis. As a result, the central bank of South Africa must choose an interest rate that will aid in luring foreign investment.

Keywords: Inflation, exchange rate, interest rate, stock market development, Economic growth.

Özet

DÖVİZ KURU ARASINDA NEDENSELLİK İNCELEMESİ
GÜNEY AFRİKA'DA EKONOMİK BÜYÜME (1980-2020)
JOHN KOLLEH WEETOR
MSc. BANKACILIK VE FİNANS
Haziran 2023 Sayfa,125

Bu tezin amacı, 1980 ile 2020 yılları arasında Güney Afrika ekonomisinin nasıl büyüdüğünü, enflasyonun nasıl değiştiğini, borsanın nasıl büyüdüğünü ve döviz kurlarının nasıl değiştiğini incelemektir. yerli mal fiyatları. Önemlidirler çünkü bir ülkenin dünya sahnesinde ne kadar rekabetçi olduğunu ve uzun vadeli değişimlerin farklı endüstrileri nasıl etkilediğini gösterirler. Kendi ülkenizde üretilen ürünlerin fiyatlarını diğer ülkelerde üretilen ürünlerin fiyatlarıyla karşılaştırırsanız, gerçek döviz kurunun ne olduğunu anlayabilirsiniz. Bu size döviz kurunun gerçekte ne olduğu hakkında iyi bir fikir verecektir. Bu tez için gerekli olan doğrusal regresyonu gerçekleştirmek için hem ARDL modeli hem de Granger nedensellik yöntemi kullanılmıştır. Bu yaklaşımların her ikisi de oldukça yardımcı oldu.

. Çalışmanın sonuçları, borsadaki büyümenin, para birimindeki değişimlerin ve faiz oranlarındaki değişikliklerin Güney Afrika ekonomisi için faydalı olacağını göstermektedir; yine de enflasyon ekonomiye zarar verir. Döviz kurları, tüm dünya ekonomisi için çok önemlidir, çünkü başka bir ülkeye ödünç verilebilecek veya yatırılabilecek para miktarını etkiler. Güney Afrika hükümeti, ulusun siyasi olarak istikrarlı olmaya devam etmesini, yeterli altyapının oluşturulmasını ve sağlam bir makroekonomik planın faiz oranlarını ve dövizleri sabit tutmasını sağlamak için çeşitli önlemler almalıdır. Güney Afrika'nın GSYİH'sındaki son büyüme, yabancı yatırımcıların o ülke ekonomisinin dayanıklılığı ve mevcut küresel ekonomik krize dayanma yeteneği konusunda daha iyimser hale geldiğinin bir işareti olabilir. Sonuç olarak, Güney Afrika merkez bankası yabancı yatırımı çekmeye yardımcı olacak bir faiz oranı seçmelidir.

Anahtar Kelimeler: Enflasyon, döviz kuru, faiz oranı, borsa gelişimi, Ekonomik büyüme.

Table of Contents

CHAPTER I

CHAPTER II

CHAPTER III

CHAPTER IV

CHAPTER V

List of Tables

List of Figures

Abbreviations

FMF: Ministry of Finance

CBSA: Central Bank of South Africa

TR: Total Reserve

PP: Phillips Perron

IFE: International Fisher Effect

RIR: Real Interest Rate

REER: Real Exchange Rate

MC: Market Capitalization

ARDL: Auto Regressive Distributed Lag

GCT: Granger Causality Test

LDCs: Least Developed Countries

WBDC: World Bank Data Center

IRP: Interest Rate Parity Theory

GDP: Gross Domestic Product

OLS: Ordinary Least Squares

ADF: Augmented Dickey-Fuller

IMF: International Monetary Fund

REER: Real effective exchange rate

EXP: Export

ECM: Error correction model

INF: Inflation

CPI: Consumer Price Index

CHAPTER I

1.1   Introduction

Due to domestic and external shocks, the rand has been volatile because the South African Reserve Bank (SARB) allowed a freely floating currency rate in inflation targeting. In recent years, local shocks have been large, increasing rand fluctuation to a level greater than the VIX, which gauges US stock price volatility and indicates global fear. Foreign investors hold large amounts of local assets and trade the rand globally as a proxy for emerging market (EM) risks. These parameters emphasize exterior shock transmission routes. Due to the rand's volatility, inflation may rise. Exchange rate fluctuations, which can be determined as an indicator of unpredictability, may still raise the risk of bonuses and inflation. Exchange rate instability might indicate uncertainty. Miyajima and Shu (2018) found that exchange rate volatility raises risk premia and the local currency rate of government bonds in important emerging market nations. Global uncertainty shocks may weaken the South African rand and raise inflation, as suggested by Mumtaz and Theodoridis (2015). Enterprises may boost prices to avoid uncertainty shocks from inflating. Kisten (2020). This research examines how and fluctuations affect South African inflation. This study examines core inflation. The headline inflation rate affects approximately 75% of CPI components. Since the government regulates the cost of electricity and fuel and since harvest circumstances affect food prices, the underlying inflation understates the true cost of living. To calculate the pass-through of currency fluctuations to inflation, we use a tried-and-true empirical and dynamic approach. Exchange rate fluctuations, which can be seen as a sign of ambiguity, may still raise the risk of premia and inflation, even though the central banks' trustworthiness has increased. This is so because fluctuating exchange rates are occasionally interpreted as an indication of unpredictable behavior. To lessen the degree of variability among fluctuations in exchange rates and depreciation, this is done in response to demand. According to the projections, a rise in exchange rate volatility would lead to a statistically noteworthy rise in the average yearly rate of fundamental inflation but would have little influence on the rate itself. Endogeneity among variables influencing the currency rate (depreciation and volatility) need not invalidate the conclusion. During

this period, the exchange rate's expected transmission to the headline inflation rate has been rather stable. However, the output gap has remained a crucial component in many models for projecting core inflation. Problems The R/US$ exchange rate often surpassed the R19/US$ mark in April 2020 for a variety of reasons. The two-week extension, the involvement of the COVID-19 pandemic epidemic, and the downgrade of the country's credit assessment were all contributors. R19 to the dollar was a common exchange rate. There will be a further two-week extension of the lockdown in April 2020. Depreciation of the rated currency may boost export volumes, all else being equal, according to theoretical estimations. This is because the goal of inflation at a relatively high exchange rate has not been seen for a long time. Kang and Dagli (2018) reference recent research that looks at the link between an economy's quantity of exports and its exchange rate. Academic and policy discourses, as the authors argue, were growing preoccupied with external imbalances after the global economic crisis of 2007, shifting their focus from nominal or real exchange rate fluctuations to the true exchange rate level.

Notwithstanding the fact that the volatility of conventional or real exchange rates had previously been the main topic of discussion, this was still the case. The shift in emphasis resulted from shifting focus from the magnitude of the actual currency exchange rate to the volatility of the nominal or actual exchange rate. However, similar discussions regarding the shift in emphasis from the volatility of the currency to its levels have not taken place in South Africa. It's probable that this is the result of South Africa's implementation of a flexible exchange rate policy and an economic strategy that targets inflation in February 2000. These two measures working together will allow the economy to grow in a way that will allow it to maintain a strong position in the international market. In this case, in addition to serving as a tool for policymakers to address issues with equilibrium in the external environment, the exchange rate might be able to absorb shocks in part. This research looks at how changes in the value of the rand affect South Africa's exports and the country's foreign revenue needs in an age of inflation targeting. The research focuses on how these factors have affected South Africa's diamond industry. The proportion of GDP that government debt consumes increased from $25 billion in 2009 to $64 billion in 2020. During this time, this rise persisted. The national debt increased significantly between 2009 and 2019, which led to

the downgrading of several sovereign credit ratings. This may have had an effect on export financing since it raised the risk of default and pushed up the price of credit default swaps. To what extent the worldwide economic downturn of 2007, increasing levels of state debt, and increased loan costs after 2008 affected the correlation between South Africa's quantity of exports and its long-term determinants is the focus of this research.

The study considers the dynamic link involving the debt to GDP ratio, the sum of credit used, interchange rates, and fluctuations in exchange rate to calculate the degree to which these variables indirectly affect export levels. To ascertain the direct effect every one of these factors has on export volume, this is done. The fundamental long-term export demand analysis conducted in South Africa or by any other research has not been expanded in this way. The investigation was initiated as a result of numerous factors occurring simultaneously. To start, it's not quite clear how big of an effect the global financial crisis of 2007 had on the short- and long-term financial effects that currency rate changes have on South Africa's volume of exports. More research is required in a number of areas, including this one. This is the predicament we find ourselves in, given the fact that we right now have a very clear understanding of the magnitude of the crisis's impact. According to Ndou (2021), the gross trade balance responds far better to shifts in earnings than it does to shifts in the actual efficient exchange rate in the near term. This is the conclusion that was reached. However, it is not entirely clear whether or not the global economic collapse had any bearing on how much these effects were actually felt in the world of reality. A judgment to this extent would give decision-makers important insights and lessons about what to do in this type of economic catastrophe. Furthermore, Ndou (2021) did not look at how the worldwide economic recession of 2007 impacted the severity of damage produced by the variables that determine export volumes. One such reason is that the administration of South Africa has to speed up economic growth immediately.
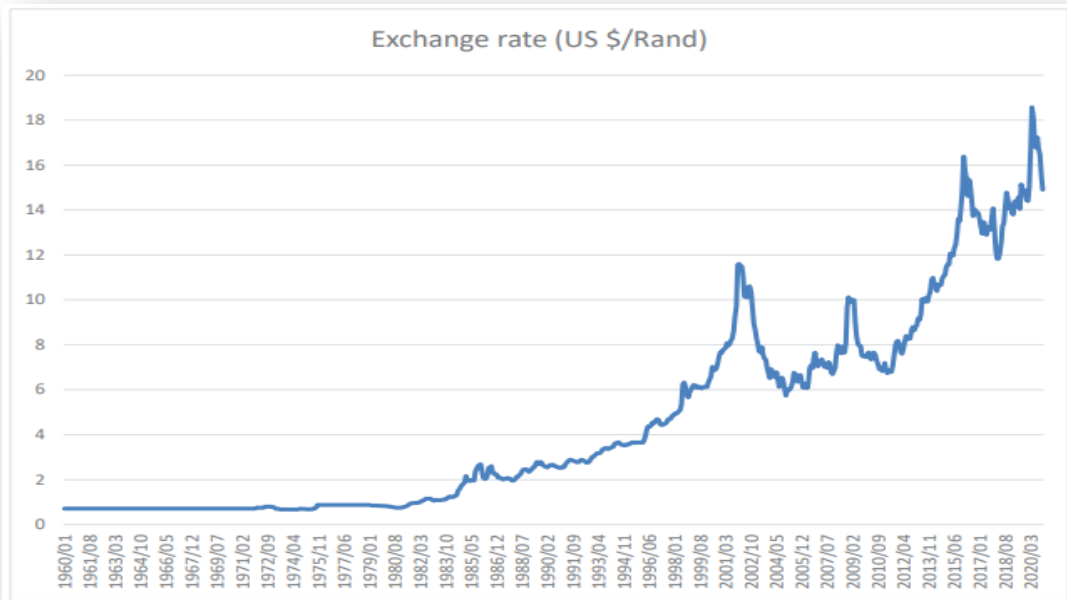
Figure 1: Trends of the US dollar/ Rand Exchange Rate (1960 – 2020)

Source: South African Reserve Bank (2021)
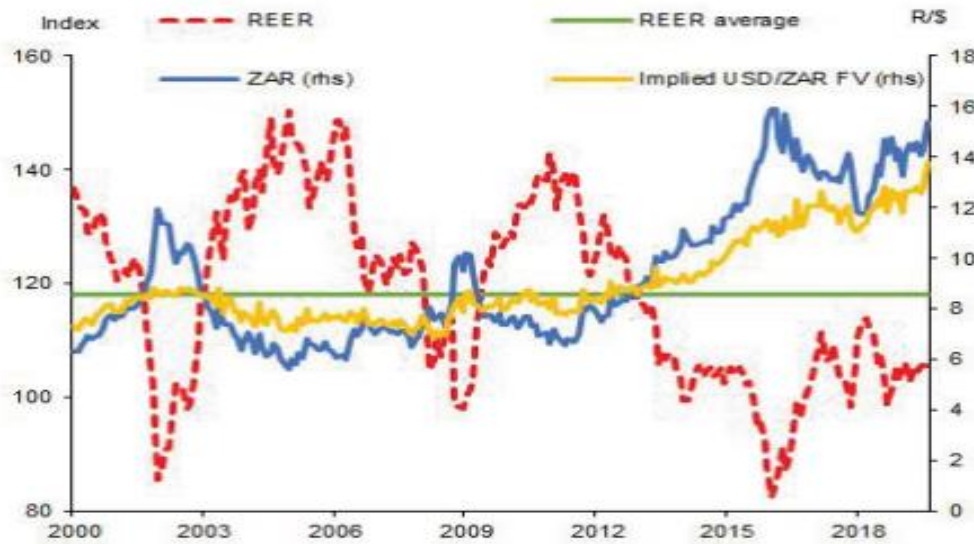
Figure 1.2 Analysis of the volatility of the Rand

Source: Singh (2019)

In educational and policy settings, the relevance of the connection that exists between the values of stocks and the rates at which currencies are traded has been

explored. Some of the well-known studies on the subject are those by Yartey and Komla from 2007, Odhiambo as well as Tsaurai from (2012), Iscan (2015), Singh, Gupta, as well as Sharma from (2015), and Sichoongwe from (2016). Despite this, their conclusions diverge. The rise in interest in the stock market may be attributed to the fact that the nation's economy is in desperate need of more savings. This is not unexpected when one considers the importance of savings with regard to investment and the development of the economy. There are a number of different criteria that may be used to judge how successful the stock market has been. According to Iscan (2014) and Singh et al. (2015), the value of an individual company's stock may be used as a stand-in to conduct an analysis of market sentiment. In particular, "this establishes a link with alternatives." (Iscan, 2015) Stock prices represent "the current worth of firms' upcoming cash flows," which relates choices about the use or investment of existing money to the possibility of changes in revenue or interest rate levels. Stock prices also link to alternatives. In addition, the worth of one country's currency is measured against the value of the currencies used by other countries using an exchange rate. Given that currencies are regarded as a part of the portfolio of investments that is managed by mutual funds, Kutty (2010) argues that the relationship connecting both of them is crucial. In order to ensure that the investment will continue to make money, enough attention will therefore need to be paid to every factor that affects this element. In the pertinent literature, there are two separate points of view on the matter that are given. The flow-oriented approach, which was introduced for the first time by Dornbusch as well as Fischer (1980), will be the first idea that is studied. This theory proposes that changes in the value of the exchange rate for a particular currency cause corresponding alterations in the results of the stock market. Putting it another way, the stock market does react to fluctuations in currency exchange rates. If you truly want to look into your alternatives, there are quite a lot of various ways to go to this location. The effect on the amount of money made by foreign companies is one way. Businesses whose revenue comes from exports will be compelled to change it into the local currency in this case. As a result, changes in the exchange rate will be the main determinant of how much money a company will make overall. One alternative framework that accomplishes this in its own way is the stock-oriented one, which shows how both of the variables are

connected. In the stock-oriented approach, the capital account balance plays a crucial role in establishing the value of the currency pair. As opposed to changes in capital account balances, it places more emphasis on the connection among the market for stocks and exchange rates through capital motions.

A decline in stock prices leads local shareholders' net worth to shrink, which in turn lowers demand from consumers for cash and lowers interest rates by reducing consumer spending. The model appears to show that the pattern of influence in the research conducted by Mlambo et al. (2013) is from the final result of the stock market's performance to that of the rate of exchange. The researchers' findings lend credence to this interpretation. For a free market economy like South Africa's, understanding how the two are connected is crucial since shifts in international markets may affect the rand/dollar exchange rate, which in turn affects the direction of the stock market. This is why we are doing this: to determine whether or not there is a link between changes in the value of the currency and the performance of the South African stock market. The curve created by Phillips was the first economic indicator to show how inflation and unemployment are related to one another. Studying the relationship between unemployment (also known as redundancy) and changes in earnings in the UK from 1861 to 1957, we discovered that A.W. Phillips, a New Zealand economist, developed the concept of the Philips curve. According to the findings of his analysis, there is a deteriorating association between unemployment intervals and changes in monetary compensation. According to Mohr (2012), the Phillips Curve was seen as a clear indicator of the trade-off between inflation and unemployment because it had little to no empirical backing. Even though there hasn't been much empirical research on the Phillips Curve, this is the case. The idea appeared logical and convincing at the time since the 1960s statistics accurately and honestly reflected the trade-off between unemployment and inflation. The United States provided the data. However, the Phillips curve produced results that were acceptable from an economic policy perspective when governments tried to utilize it as a tool to control unemployment. The Phillips curve, which relates to the Economics Lab for Transitional Research in Podgorica, is the cause of this. The Republic of Montenegro's Journal of Economic Research asks, "Is there a link between inflation and fluctuating exchange rates? Inflation and the writings of

Semosa and Kanayoment made it impossible to keep the connection going. The trends in the data that started in the 1970s and went on into the present were not precisely predicted by the Phillips curve. Stagflation is the name given to the circumstance that took place when, over a period of years, both the level of inflation and the unemployment rate were higher than what the Phillips curve projected. The Phillips curve was ultimately found to be unstable, which prevented it from being useful for achieving policy goals. One model that incorporates the viewpoints of various macroeconomic schools of thought is the AS-AD model. As a result, compared to some of the other models, it can provide greater detail on evaluations of unemployment and inflation. Numerous different causes may contribute to inflation in short time periods, but the exact nature of the problem depends on the interaction between real GDP and price level. The actual GDP's impact on the price level will determine the core source of this problem. Cost-push inflation as well as demand-pull inflation are two distinct types of inflation that can be distinguished using the AS-AD model.

An occurrence known as demand pull may occur when there is a rise in the cumulative (aggregate) demand (AD) for services and products in an economy but there is no shift in the total supply (AS). This may be the result of an upsurge in the value of currency in movement, an increase in the total amount of cash expended by government entities, or both, as well as an increase in individual spending, export earnings, or investment spending. Mohr, (2012). The term "cost-push inflation" describes a specific sort of inflation. When the price of raw materials goes up, inflation might follow. the main factors driving price hikes the following elements, as suggested by Mohr (2012), could contribute to inflation: Increases in wages and salaries, higher expenses for raw materials and finished goods, natural disasters, a decline in economic output, and higher profit margins for businesses are a few examples of variables that could be to blame. The AS-AD model is able to provide the most accurate estimate of the inflation rate in South Africa because Stats SA uses both the CPI and the PPI in its evaluation of the rate of inflation. The problem of inflation has affected every nation in the world at some point, yet the rate of inflation varies widely from one country to another. The most frequent consequences of this phenomenon are unanticipated profits and losses for borrowers as well as lenders, employees, and businesses, as well as money being

diverted from the production of goods and services in order to forecast rises in prices. This aspect of the phenomenon occurs the most frequently. As a consequence, inflation makes money less useful as a medium of exchange. The exchange rate is a very important aspect of financial transactions connecting two or more different nations due to the increasing globalization of economies. The conversion of South African consumers' or producers' Rands into the currencies of the countries they wish to trade with is necessary before they may engage in foreign trade. The question that is posed to trading partners the most frequently is the amount it might cost to buy the currency of a different nation. This clarifies the justification for why any nation's elected politicians or monetary authorities work so hard to preserve the value of its own currency. Since it plays such a crucial role when it comes to economic growth and stability, a stable exchange rate is very advantageous for a nation. The function it plays throughout each stage is to blame. The question of whether or not the total equity price of the stock market is related to the rotation rate of currencies has been the subject of much study. In line with the research of Basher et al. (2016), the word "exchange rate" refers to the value of one currency as measured in terms of another. A large number of free-market economies around the world, particularly the economy of South Africa, depend heavily on trade, which has a considerable impact on exchange rates, as reported by Auer and Schoenle (2016). As a result, governments closely monitor, research, and control currency exchange rates as one of their economic indicators.

One element that may impact both a country's political stability and economic prosperity is its exchange rate. When deciding where to put their money, foreign investors choose nations with robust economies. When a nation shows both strong economic development and political stability, investors are more likely to put a lot of money into its economy. Capital flight occurs, for example, when investors stop placing their faith in a country's currency because of political unrest in that country. According to Mahmudu and Gazi (2009), the direction of monetary policy, techniques of risk management, the pricing of financial assets, and government policy toward financial markets are all profoundly affected by foreign exchange rates on exchanges for stocks. The Johannesburg Stock Exchange (JSE) Limited is responsible for overseeing the stock market in South Africa. Here is where anyone interested in purchasing or selling shares

may do so. In terms of size and longevity, the Johannesburg Stock Exchange (JSE) is the biggest and most prestigious on the African continent. The rate of turnover has traditionally been fairly low throughout its existence. T. Ncanywa, O. Ralarala, and others (2019) This is true despite the organization's comparatively large size. The JSE said that whereas the All-Share index hit 19.49% in 2012, it only managed to reach 4.53% in 2016. 2015 was one of the most difficult years for the South African stock market, with an all-share index that was down 2.37% from the year before. Ramey, G., and Ramey, V. A. (1994) state the growth of an economy is negatively correlated with currency rate volatility. shows that a rise in volatility of 50% is connected with a reduction of 0.4 percentage points in annual per capita growth, which adds more proof to this claim. The degree of an economy's openness, based on Enyaa (2011), is one of the elements that contributes to a market's volatility. It was crucial to determine whether or not changes in exchange rates were to blame for the discrepancies. The primary illustration of a macroeconomic component used in the study that has the ability to alter stock market values is the currency exchange rate. Interest in investigating a correlation between stock price and exchange rate has been inspired by concerns about both markets' cyclical nature and their inherent volatility. According to Akdogu (2016), insufficient precision in cost-of-capital forecasts hampers effective capital deployment, leading to significant volatility. The volatility of exchange rates has been a focal point in the discussion of the relative merits of various exchange rate regimes. Among currencies from emerging nations, the rand has been particularly volatile in recent years. Recent South African attempts to stabilize the rand have failed because of the double whammy of global economic uncertainty and capital outflows from wealthier countries. Changes in South Africa during the last decade have been dramatic. Pretorius and de Beer claim that the Myburgh Commission was set up to examine the collapse of the rand because of its "worrying volatility." The decline in the value of the dollar prompted the formation of this panel. The rand's value dropped to an all-time low of R3.64 per US dollar on May 29, 2002, from a high of R13.002 on December 20, 2001. Between January 1, 1996, and May 29, 2002, this value decreased. Recent events have brought exchange rate regulatory concerns to the center of the ongoing discussion of economic reform in South Africa. The actual exchange rate is an essential part of relative pricing since it allows for

an accurate depiction of long-term growth across all sectors. Caballero's research, as well as those of Corbo (1989) and Serven and Solimano (1991), are only a few examples that show how the real exchange rate matters when determining the level of private investment and exports. In this context, one of South Africa's key policy aims is to find a level for the real exchange rate that is consistent with capital flows and may be considered "sustainable" over time.

One of South Africa's main policy issues that stands out in this situation is this: This idea is often referred to as the "equilibrium actual exchange rate." A further task that needs to be done is to figure out what the actual exchange rate will be in line with an economy in the future that is more open, ideally more export-oriented, and less reliant on the country's non-renewable resource base. The ratio between the prices of the currencies in two different economic zones is referred to as the "exchange rate." For purposes of demonstration, we must determine how many rands of the South African rand (ZAR) are required to purchase one dollar (USD). In other words, on January 1, 2009, 6.79 rand in South African money was the equivalent of one dollar in US currency. Assets with a separate currency-denominated value make up another part of foreign exchange. It is possible to use various overseas resources in the same ways as foreign money, including sending money across borders and deferring payments for things that need to be done across borders. Utilizing foreign currency for payment for overseas operations is one illustration of this. The market for cash abroad has grown over the past several years as a result of the growth of internationalization, which has sparked an increase in trade between nations, and the implementation of a system for electronic payments. In addition to being one of the biggest economies in the world, the market for foreign currencies is also one of the most lucrative for investment and commercial banks. Chiira (2009) asserts that one major element influencing how profitable banks are is the volatility of currency rates. This is because the ability of banks to participate in monetary intermediation is impacted by exchange rate fluctuations. The availability of an exchange rate for a currency is a result of international trade. This makes it more likely that national economies will grow and prosper. Academics have come to the opinion that significant changes in the rate of exchange harm a country's trade volume and its current account of payments as a result

of extensive empirical and theoretical studies on international trade. These are the conclusions that researchers who have extensively studied international commerce have reached. Many different research teams have conducted investigations along similar lines. This disparity may be seen in the different ways that governments around the world have responded to the changing values of their national currencies over time. Since the middle of the 1990s, the South African Reserve Bank (SARB) has refrained from trading in the market for foreign exchange rates. This is done to go on with the expansion, employment, and redistribution (GEAR) initiative's aims. Since 1997, when the Reserve Bank of South Africa (SARB) introduced the South African Rand (ZAR) as the country's official currency within the framework of a freely floating exchange rate. Bah and Amusa (2003) Nevertheless, the implementation of an economic strategy that is focused on international markets has increased the likelihood that growing exports will be a key driver of the economy's continued expansion. The Rand has gotten increasingly erratic as currencies throughout the world are permitted to float freely. Therefore, it is crucial to look into how changes in the Rand affect exports and, consequently, the economy of a nation. South Africa has to quickly increase its export rate of goods. The debate centers on whether or not the Rand's depreciation has increased South African exports' competitiveness in overseas markets or whether or not the Rand's volatility has made it difficult to determine whether or not an organization is profitable. Export production has suffered as a result. The subject of how a country's exchange rate affects economic growth is extremely important from both a qualitative and a strategic perspective. This is so because the significance of both factors is equal. The methods that can be used to accomplish South Africa's developmental aim in a way that enhances the general well-being of the population are described below. The foundational paper for the New Growth Path is crucial. This document lays out specific measures that the government may take to lessen the effect that the Rand has on the economy and recognizes the difficulties that come with maintaining a currency that is not competitive. The document also outlines specific actions the government could take. On page 2, the book expressly discusses the trade-off between a strong Rand and lower import costs for consumer goods and capital goods vs. an attractive currency that promotes growth in manufacturing, job creation, and exports. A strong currency that promotes growth in

manufacturing, hiring, and exports can be found to be a trade-off. The Industrial Strategy Action Plan for 2011 also makes the suggestion of maintaining a competitive exchange rate. (IPAP, 2011). In order to enlighten readers on the current state of the foreign exchange market, the South African Reserve Bank (SARB) would like to provide some information. This data contains the following: The increasing value of the currency has resulted in some weird things because of the significant impact that the rate of exchange has on the prices that people pay for services and products. While South Africa's competitiveness in trade has grown, inflation has dropped (SARB, 2012). This shows that the arguments for and against growth-through-competitiveness and currency rate pass-through remain valid, particularly in light of the impact a declining Rand has on inflation. The study's findings suggest that a more favorable real effective exchange rate would eventually lead to an increase in net exports, and that that impact might be seen between 1994 and 2011. In the short term, this impact is meaningless. We are able to establish empirical proof of the J-curve effect in South Africa by conducting our research in this way. Below is the outline for the subsequent sections of this essay. This evidence is presented in the section titled "Prior Empirical Evidence". We go into further detail about our econometric model, which we created for the South African rand and the trade balance, in Section 3. We will wrap up in this final section of the article. Since the system for controlling inflation was established in February 2000, South African banking institutions have frequently been successful in keeping volatility within the intended range of 3-6 percent. Economic growth was insufficient during these trying times to significantly lower the unemployment rate. The South African Central Bank's mission statement was updated in February 2010 to emphasize a more balanced approach. This strategy makes sure that when setting interest rate levels, central bankers take the condition of the economy into consideration. The market controls the movement of the currency rate, leading to increased volatility as the Central Bank is now more preoccupied with containing inflation than it is with preserving price stability. In this fictitious scenario, we'll examine not just how changes in the exchange rate and cost shocks affect the course of production development but also how real interest rates react to each of these shocks in particular. We will also investigate how real interest rates react to changes in exchange rates and price shocks. Additionally, we will look into the

possibility that the Central Bank uses a Bayesian sign restriction technique to boost reserves in a situation with unusually high oil prices. One of the most crucial topics of conversation regarding economic reform in South Africa is the issue of worries over the regulation of the country's currency exchange rates. A very important relationship price that, over time, demonstrates how interrelated things are becoming is the real cost of exchange. Most people are aware that exports and private investment are greatly affected by the level of the actual exchange rate as well as the degree to which it is relative to the level at which it would be considered to be in equilibrium. South Africa's political problems are highlighted in this way. Among these is determining the precise exchange rate that will function with a future economy that is less dependent on non-renewable resources, more open, and export-focused. Finding the real exchange rate that is consistent with an economy that will be more export-oriented and less reliant on non-renewable resource bases is also known as determining the point of equilibrium real exchange rate, which is the rate at which long-term capital flows are "durable." For South Africa, both of these real exchange rate considerations are crucial. In addition to contributing to the maintenance of an economy that is often well-diversified, the mining industry has a significant impact on macroeconomic policies, notably those pertaining to currency rates. When seeking to ascertain the true effects of the exchange rate, it is essential to take into account trade shocks, especially ones that occur in the mining sector, as well as significant swings in capital flows. These shifts reflect the unpredictable political climate in South Africa during the last quarter-century. It is important to emphasize that all of these factors have an impact on the actual exchange rate. Alterations in the trade environment, especially the gold market, are another possible element in determining the real exchange rate. In order to prevent the Reserve Bank deficits that would come from attempting to counteract the effects of large capital flows, policymakers must decide whether to prevent the value of the currency from rising, which would reduce export competitiveness, or to allow the value of the currency to grow. Examining the two options side by side is essential. In light of recent occurrences, it is clear that the South African government has a tough time keeping track of the country's finances in a global market. We think our research is the first of its kind to rigorously quantify the effects of a fictitious example of the South African real

exchange rate and to characterize its fundamental (long-run) and immediate (short-run) effects. The model spans 1970–1995; the last three months of that time period coincide with the end of a long-standing dual exchange rate system. This means that for the next three months, the model will only be run once a month. Researchers in South Africa employ co-integration techniques and single equation error correction models to better understand the factors that moderate the real exchange rate over the medium and long terms. The co-integrated equilibrium is calculated using a real exchange rate theoretical model that is grounded in the macroeconomic balancing technique.

Finding a real exchange rate that is sustainable with an economy in the future that is less reliant on the country's non-renewable natural resources and more open and, likely, export-oriented is one of the most important policy challenges for South Africa in this regard. In addition to serving as the backbone of a diverse economy, mining has also had an impact on macroeconomic policy, especially exchange rate policies, which are other significant policy challenges for South Africa. Figure 1, which is found here, shows the actual exchange rate's historically erratic volatility throughout time. The government must decide between two undesirable options: permitting the exchange rate to increase, which would decrease exporters' ability to compete, or blocking this rise in the currency, which would cause the Reserve Bank to incur losses. Recent occurrences have made it clearly evident that managing capital flows in a country with an increasingly global economy presents a huge problem for South African authorities. According to a sizable portion of business experts, fiscal policy should put its main emphasis on taking steps to make sure that prices don't change from where they are now. Variations in the value of a nation's stock market index are likely to have an impact on the share prices of both domestic and foreign businesses, particularly those that rely largely on exports. The worth of an organization as well as the financial viability of its businesses that are based in other countries will immediately alter whenever the value of the converted currency rate changes. As a result, changes in the amount of money that an international company generates through its operations may cause the stock market to react. On the other hand, domestic enterprises are just as vulnerable to fluctuations in exchange rates as are foreign ones. This is because the majority of domestic businesses export some parts of their finished goods and import certain parts of their production

inputs. For instance, when a devaluation policy is implemented in an economy, the cost of imported inputs increases while the cost of products that are exported decreases as a result of the policy. Businesses that depend on exports gain from a currency's depreciation, which raises both their earnings and the price of all of their shares. Wu (2000) and Aggarwal (2003) As a result, understanding the relationship between shifts in market capitalization and changes in currency prices is probably advantageous for investors both at home and abroad. Shareholders are better equipped to make investment choices once they understand the relationship involving the exchange rate as well as market capitalization. It will be simpler for them to predict future trends in both their own and other markets. Phylaktis & Ravazzolo (2005); In referencing Mishra et al. (2007), There seems to be some commerce between the South African stock market and its American counterpart, despite the much lower size of the South African market. Many South African companies are now also listed on the New York Stock Exchange (NYSE), in addition to the Johannesburg Stock Exchange and the London Stock Exchange. Trading and stock exchanges in the United States are more numerous than their South African counterparts. The New York Stock Exchange (NYSE), the National Association of Securities Dealers (NASDAQ), and the American Stock Exchange are the three marketplaces you should concentrate on. The ASE, the largest stock exchange in the world, is located in South Africa. At the end of trading on the New York Stock Exchange and the National Association of Securities Dealers in 2006, the total market value of all securities reached $15.4 trillion. These changes are a reflection of the unstable political atmosphere that has pervaded South Africa over the last quarter of a century. It cannot be stressed enough how much these variables affect the market rate of currency. Alterations in the trade environment, especially the gold market, are another possible element in determining the real exchange rate. In order to prevent the Reserve Bank deficits that would come from attempting to counteract the effects of large capital flows, policymakers must decide whether to prevent the value of the currency from rising, which would reduce export competitiveness, or to allow the value of the currency to grow. Examining the two options side by side is essential. In light of recent occurrences, it is clear that the South African government has a tough time keeping track of the country's finances in a global market. We believe ours is the first study of its sort

to systematically quantify the repercussions of a hypothetical illustration of the South African real exchange rate and to specifically define its fundamental (long-run) and immediate (short-run) impacts. The model covers the years 1970–1995, with the last three months marking the conclusion of a long-standing dual exchange rate regime. This results in the model being run only once every month for three consecutive months. To learn more about what influences the real exchange rate in South Africa over the medium and long term, researchers use co-integration methods and single equation error correction models. Based on the macroeconomic balancing approach, a real exchange rate theoretical model is used to determine the co-integrated equilibrium.

After all trading was concluded, this amount was determined. The total amount of funds that may be placed on the market is represented by this number. The market capitalization of the Johannesburg Stock Exchange (JSE) as of March 2018 was $711 billion, making it the 18th biggest stock exchange in the world. This ranks it as the eighteenth-best stock market in the world. The JSE has high levels of volatility, as do the vast majority of new market exchanges. By purchasing equities from emerging nations like South Africa, shareholders who are part of the more secure markets of the advanced nations continue to increase their portfolios. Even though South Africa's emerging market is renowned for having higher price fluctuations, this is still a reality. One cannot exaggerate the importance of commerce between the United States and South Africa. The United States plays a leading role in the global monetary and economic systems as well as international commerce. On the opposite end of the scale is South Africa, whose economy has been entirely open to international trade and investment since the country gained independence in 1994.

Trade involving South Africa and the United States increased from a total of $5.2 billion in 1999 to a total of $10.8 billion in 2004. The revenue South Africa receives from commerce with the United States has increased significantly. IMF, 2006 The rand to dollar exchange rate is unstable, which could have an impact on regional companies that import parts or export the majority of their output. This is but one of the numerous advantages gained by South Africa's economy from its increasing openness to foreign trade, in particular with the United States. On the other side, if the value of the currency increases, local businesses' level of competitiveness will decrease since their products

will become more expensive on the global market. In contrast, as the value of the currency depreciates, this occurs. Companies will experience a decline in sales and earnings if they lose their competitive advantage in the market, which will ultimately cause a sharp decline in the selling price of their shares. The historically low interest rate environment in the United States and the significant money inflows that have taken place in recent years from other countries, which are driven by investors' frantic search for yield, have put the South African Reserve Bank, also known as the SARB, in the position of having to deal with new challenges in managing currency exchange rate issues. These two elements have caused investors to scramble in pursuit of yield. We are currently dealing with problems that are directly caused by the record low interest rate in the United States. These two elements work together to present the South African Reserve Bank with a brand-new challenge. South African exports reached R101.2 billion in March 2017, up 16.4% from February, according to Trading Economics (2017). Sales of machinery as well as electronics (27%), precious metals as well as stones (33%), chemicals (17%), and mineral products (11%), together with sales of vehicles and transportation equipment (19%), all contributed to the increase of 8% in overall sales. The top five biggest export destinations were, in order, Botswana (4.6%), China (8.7%), the United States (6.2%), and India (4.6%). 8.8 percent (4.4 percent) of all exports came from Germany. South African exports averaged R16233 million per year between 1957 and 2017, reaching a record high of R105163.26 million in 2017.

1.2 Statement of the Problem

Some of the difficulties that a country's economy faces as a direct result of the exchange rate A number of economic factors, including GDP growth, the flow of capital, inflation, and interest rates, may be impacted by the exchange rates of currencies. Many people do not think much about exchange rates since they have little need to be concerned about them. The average individual utilizes the currency of their country of residence for day-to-day transactions. Only in extremely specific situations, such as if a person is traveling internationally, purchasing imports, or transferring money to a nation other than their own, are currency exchange rates important. If you want to go to Europe, a strong currency may be something you look for in the nation you choose

to call home. A strong currency, on the other hand, might have serious long-term consequences for the economy, including the devaluation of whole sectors and the elimination of thousands of jobs. Although many people like powerful currencies, there is a chance that a weak currency may offer greater economic advantages. Strong governments, a thriving economy, and currency stability increase a nation's ability to attract foreign investment. To attract investment from outside its borders, a country must have a currency that is at least somewhat stable. If this doesn't happen, the possibility of exchange rate deficits brought on by the currency's devaluation can deter investors from making international investments.

1.3 Purpose of the research

The growth of exports and import regulations are significantly influenced by a country's exchange rate. Additionally, it is a gauge of global competitiveness and a valuable sign of economic success. Global trade, the equilibrium of payments, and the economy as a whole may be significantly impacted by currency changes and volatility, whether brought on by outside factors or governmental policies. Since then, I've been interested in how the value of one currency impacts another, and I decided to focus my thesis on the rand and its impact on the growth of the South African economy.

1.4 Research Questions

1. What function impact does exchange rate have in the South African economy?
2. What impact do the South African economy's exchange rate, inflation, and stock market development have?
3. What kind of link exists between the growth of the economy, inflation, the performance of the stock market, and the exchange rate?
4.

1.5 Research Hypothesis

H1: There is no relationship between exchange rate and economic in South Africa

H2: There is a relationship between exchange rate and economic in South Africa

H1: There is no relationship between inflation and economic in South Africa

H2: There is a relationship between inflation and economic in South Africa

H1: There is no relationship between stock market development and economic in South Africa

H2: There is a relationship between stock market development and economic in South Africa

1.6 Significant of the Research

Foreign exchange refers to the buying and selling of the currency of one nation in exchange for the currencies of other nations or for other units of account. That's crucial because the rate at which one currency may be exchanged for another affects the financial condition of a country, which in turn affects the well-being of all of its residents. While a nation's weak currency benefits (hurts) exporters by enabling them to advertise more (less) overseas, a strong currency at home hurts (benefits) consumers by raising the price of imported goods. The significance of the exchange rate lies in the power to advance or undermine certain national interests. The government will benefit from this research's understanding of the trends of the South African currency rate, inflation, and stock market development.

1.7 Limitation

This study's focus is on how the currency exchange rate and South Africa's economic development are related. The study's time frame covers only the years 1980 to 2020 in South Africa. There are various hypotheses about exchange rates, but this study only looks at three of them: the International Fisher Effect (IFE), Purchasing Power Parity (PPP), and Interest Rate Parity (IRP). There are many models used for the analysis of regression, and this research is restricted to the ARDL as well as the Granger Causality Test for the purpose of regression analysis. However, there are many models used for model specification.

1.8 Definition of Terms

Exchange rate: The term "exchange rate" is used to describe the ratio between the intrinsic value of one currency and another. This word has to do with how much one unit of currency is worth. The fundamental factor that determines the exchange rate that is in effect within a monetary system that employs a variable exchange rate is the global

currency exchange market. This market is available for the involvement of an important number of consumers and vendors from a wide variety of backgrounds at any one time. The "spot exchange rate" is the present price at which two distinct currencies may be exchanged. While it is designed for shipment and payment in the future, the futures exchange rate, on the other hand, is decided upon and exchanged in the present. Furthermore, the spot rate of exchange is a price that is decided upon and traded immediately.

Inflation: When economists refer to inflation, they are referring to the general rise in the cost of products and services offered across a nation. Each unit of cash might be able to purchase less when the general cost of goods rises. This is due to the declining value of each unit of currency. While inflation results in price increases, deflation is the reverse and refers to a decline in the general level of prices for goods and services. The majority of the time, inflation is calculated using the proportional change in a broad price index from one year to the next. The inflation rate is another name for this.

Stock Market: Participants in the stock market, often referred to as a share market or equity market, are those who trade in and out of stocks, which are frequently called shares and denote ownership interests in companies. The share market is a different name for the stock market. As with the sale of shares of private enterprises to investors via equity crowd funding platforms, the exchange of these assets may occur in both public and private markets. Most people typically have a plan in place when it comes to money issues.

Economic growth Economists define "economic growth" as an increase in the wholesale cost of an economy's commodities and amenities over the duration of a specific fiscal year, taking the effects of inflation into account. Statistics experts frequently use the real GDP, also referred to as the actual gross domestic product, or GDP, to measure growth.

International commerce: is the transfer of funds, goods, and services across international boundaries in order to meet a demand for a certain good or service or to meet a need. Because the motivations and behaviors of the parties involved in a transaction are essentially the same whether the trade takes place across borders or not, there is no fundamental difference between domestic and international business.

Balance of Payment: The expression "trade deficit" is used to describe the gap between a country's total cash inflow and its total cash outflow during a certain time period. When comparing the relative worth of two currencies, the ratio between them is referred to as the exchange rate. This difference is quantified in monetary terms. A nation's payment balance, also known as the equilibrium of international payments and abbreviated as BOP or BoP, is the total amount of money that moves in and around the globe over the course of a given period of time (for example, a quarter or a year). Different countries have different names for the same concept as the balance of payments, but all three refer to the same thing. People, organizations, and governments all use these exchanges of money and goods and services to learn more about the amounts of money involved and the profits made.

CHAPTER II
2.0. LITERATURE REVIEW

2.1. Introduction

By reading the topic's current literature, you might be able to learn more about prior studies on the subject. Analyzing previous research thoroughly is crucial before selecting a study topic. The information used in the study could come from readily accessible market sources such as novels, newspapers, magazines, printed and unpublished research papers, as well as other books and periodicals. This chapter goes into considerable detail about the currency rate, price increases, and economic growth. In recent years, academic institutions have conducted a large amount of research on both the exchange rate for currencies directly and the literature that surrounds it. Regarding currency exchange rates, a lot of readily available data and information are available. Many academics and experts have contributed their time and knowledge to conducting exchange rate research. This volume provides an overview of the study's conclusions, which drew significantly on earlier research on currency rates of exchange and related topics. The theory and actual studies on financial exchange rates will both be examined in this volume. The most significant studies, which are given below, should be taken into account in light of the most recent research.

2.2. Theoretical Framework

Several explanations are put forward in an effort to clarify the concept of exchange rates and how they relate to inflation and economic growth rates.

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

2.3. Theories of Exchange Rate

The best possible currency area (OCA) theories, first proposed in 1963, are the most well-known theoretical models for establishing proper exchange rate regimes. Topics discussed in this literature include the economic cycle and trade stability. Along with shock homogeneity, the openness and flexibility of the job sectors have been taken into consideration. According to the theory, a fixed exchange rate system could

encourage investment by reducing the amount of money that is valued more than interest rates. Investors may find it more appealing to take risks as a result. The development of industries and trade may also benefit from lowering currency rate volatility and, consequently, the cost of hedging. Despite this, it is still conceivable that it may slow down the expansion of commerce and production since it will stop, delay, or postpone the crucial action of modifying existing price structures. The theory that guides the study of various exchange rate regimes has become increasingly sophisticated since the switch from a flexible rate of exchange for currencies to a fixed exchange rate occurred. This change came about as a direct result of switching from a variable to a standard exchange rate. A few examples of theories that evolved during the time of controlled exchange rates include the elasticity method and the consumption method, both of which are concerned with the actual economy of the nation. These two approaches might each be categorized as either an "absorption technique" or an "elasticity method," respectively. In contrast, given the current environment of financial deregulation, the banking industry has a significant influence on how rates of exchange will evolve. How much one significant currency is worth in relation to another significant currency depends on a variety of different factors. Many different theories about the currency exchange rate have been developed using these elements as their foundation. Many of the significant concepts will be covered in this chapter or section.

2.3.1. The Purchasing Power Parity Theory

In order to objectively evaluate the value of two currencies, the idea of "purchasing power parity" describes many techniques. From Cassel (1918). Even if Wheatley and Ricardo received a lot of credit, the Swedish economist Gustav Cassel became the first to formulate this theory in a systematic way. Real exchange rates across nations are assumed to be in equilibrium when the PPP theory of currency conversion predicts that the nominal rates of exchange will shift as needed to reflect this. Shortly after the rate of joblessness and general price level rose, so did the money supply. suggesting that monetary policy determines the trajectory of change even though the precise mechanisms required to reach a given prevalent cost level are not always stated explicitly. This is explained by PPP speculation, which holds that the expansion of the

currency supply follows the expansion of prices. Froot, Rogoff, and Rogoff (1994); Dornbusch (1988). According to the commerce theory, which supports the PPP hypothesis, the mechanism that ensures that costs in two nations that trade will eventually be equal additionally guarantees that imports as well as exports will eventually be equalized. A well-known illustration of this idea is Hume's price-specie-flow mechanism. Shaikh, et al. (1997) Hume suggested the mechanism for this. Shifts in the quantity of money flowing through the financial system, which are in turn impacted by the nation's total trade balance, are what cause price shifts. The "two goods, two nations" model involves an assessment of the value of money in order for commerce to take place between two nations and two types of products, in accordance with conventional theories of commerce like Ricardo's. One country would make more money from exports if it could produce both sorts of goods with greater efficiency and profitability than another (owing to better productivity and technology). According to the total theory of money, prices will increase indefinitely, or until one of the two fundamental benefits ceases to exist. Prices decrease in both countries as a result of the money leaving the one with lower production levels, which increases the appeal of buying the goods from a supplier in another nation. The goal of this project is to use the flow of money to transform absolute advantages into relative advantages. Due to how crucial the PPP theory is to global trade and finance; it has been the focus of numerous studies for more than ten years. The Purchasing Power Parity (PPP) idea is important since it allows for a comprehensive evaluation of a country's economy. There has been a lot of research on the PPP hypothesis in advanced economies, but more has to be done as more sophisticated statistical methods become available. In this theory, the equilibrium exchange rate is determined through analyzing the relative buying power of two devalued banknotes from various parts of the globe. Is it conceivable that the amount of inflation in one country might affect the rate of exchange among two paper currencies that cannot be converted into one another? Consumer purchasing power can be divided into two distinct categories: The second interpretation is referred to as the relative interpretation, whereas the first interpretation is known as the unambiguous version.

The Absolute Version: Exchange rates are based on the principle of purchasing power parity, which should correspond to how much each national currency unit may be spent.

The price distinction among two sets of similar goods in two nations is another definition of the exchange rate. A concrete illustration of how this frame of view operates would be useful. The price of one unit of commodities X, Y, and Z in South Africa is 450 South African rand, 550 South African rand, and 650 South African rand, respectively. But in America, one can purchase X, Y, and Z for the same cost. As a result, $27 is equal to 500 South African rand in each of their home nations. The value of the rand in US dollars can be determined using this method. The purchasing power parity hypothesis is straightforward and elegant in its most basic form. This does not imply that it is flawless, though. To start, this method of calculating exchange rates is ineffective because its objective is to determine the absolute value of the currency (or purchasing power). In reality, relative value is frequently used to gauge purchasing power. Second, there are differences between the types of goods and their standards between the two countries. The procedure of expanding the structure of prices for goods is significantly hampered by these inequalities, which require prompt rectification. Along with changes in the quality and diversity of commodities, three more factors also affect transportation costs and demand patterns. Numerous factors come into play, such as taxation policies, tariff systems, the level of government meddling and regulation, and many more. When comparing two or more currencies, it may be difficult to get an accurate sense of the true exchange rate due to these variations. The Relative Form (II): When comparing two currencies that are presented in their relative form, Cassel developed the purchasing power parity (PPP) hypothesis to justification for changes in the exchange rate that are perceived to be in a state of equilibrium. To compare the significance of one currency to another, this was done. It is well recognized that instabilities in exchange rates and changes in the buying power parities of various currencies are related. It's possible that variations in the comparative values of two currencies over an extended period of time will have a big impact on how much a particular currency is worth when it's exchanged in the future. This is due to the interdependence of currencies. The link between exchange rates and the average price level is what ultimately decides exchange rates in the base and current years, as well as by the percentage of the price indexes of both nations in their corresponding base and

casing periods. It's also important to remember that the price indexes for the two nations use different base years now than they did in the past.

2.3.2. Theory of Interest Rate

Equilibrium According to the theory of interest rate parity (IRP), the spread between the theoretical and real values of two currencies will be the same if interest rates in the two countries are same. Assuming the two nations use the same currency, this is accurate. Interest rates, market rates, and foreign currency rates are intimately intertwined, as shown by the idea of interest rate equivalence. This idea makes reference to the existing connection. The result is a major shift in the currency markets. If you want to find out what factors influence the future value of a currency, the IRP hypothesis might be useful. This theory states that there can never be an imbalance in the interest rate distribution between any two currencies. Instead, any discount or overpriced future conversion rate for another currency that currently exists would be conclusive evidence of a disparity. Alternately, one could conclude from this idea that there is never going to be a circumstance where the rates of interest on two different currencies are not spread equally. This theory states that the size of the change among the expected and real rates of interest of the two nations is comparable to a sizable foreign exchange discount. International Fisher Effect 2.3.3 Economists claim that the International Fisher Effect (IFE) is frequently supported by data. One theory state that as the rates of interest between two currencies change, the corresponding currency prices also change. Researchers looking into the International Fisher Effect (IFE) claim that by examining the variations in nominal interest rates across nations, they may forecast changes in the value of those currencies. The IFE argues that higher inflation rates cause a currency to lose value compared to those of other countries with lower required interest rates. To describe this phenomenon, we use the term "income effect." The IFE is supported by a wide range of evidence types, and in recent years, it has become more common to predict precisely how currency exchange rates will move depending on projected inflation.

2.3.4. An Overview of the International Fisher Effect (IFE)

The IFE is a technique for prediction shifts in exchange rates that considers both the current rates on risky assets like government bonds and the potential lending rates that may be used in the future. This method predicts changes in exchange rates by looking at more than simply changes in inflation rates. Instead, it employs a hybrid approach that demonstrates a connection between increasing inflation rates and changes in the value of a currency. Understanding the variables that influence rates of interest, such as shifts in the regulation that governs whether those rates are modified, is crucial when attempting to determine the value of a nation's currency on the global market. Understanding how other economic influences, such as shifts in the policy that governs how interest rates are modified, affect interest rates is crucial when attempting to determine the amount a currency is valued on the global market. As a result, the currencies of nations with higher interest rates would momentarily depreciate. To honor the American economist Irving Fisher, this concept was given his name. Irving Fisher is renowned for having been one of the most comprehensible American economists throughout history, in addition to being a fantastic mathematician. He had the foresight to include mathematical concepts in practically all of his theories, but he did not do so until after he had spelled out the core concepts in straightforward English. Furthermore, he was very straightforward in his explanations. Fisher's Theory of Interest is divided in half for the subject of technical economics, which only graduate economics students are able to consume (and fully grasp) in one session.

(1)   2.4. The Significance of the Exchange Rate

For a number of reasons, the exchange rate is significant.

a. This market acts as the principal connection between a diverse diversity of produces, services, and investment securities on both a national and international scale. With the current exchange rate, we are able to determine how much anything will cost in the native currency of another nation.

b. Currency fluctuations have the potential to have an effect not only on the current level of inflation but also on projections made for the not-too-distant future. Alterations in the value of the dollar have a significant influence on the prices that consumers in the

domestic market pay for imported products and services. In the near term, a stronger peso brings about a reduction in the rate of inflation because it lowers the prices of imported goods and services that are priced in pesos, such as transportation, which is reliant on imports.

c. The country's exports and imports might be affected by fluctuations in the currency rate, since they have an influence on international commerce. If, for instance, the value of the peso was to grow, the prices of our exports may go down. As a consequence of this, comparing our products to those of other countries whose currencies have gained in value could make them less competitive. The value of one currency relative to another has an effect on how much it will cost to fund a country's external debt (principal and interest payments). As the peso gains strength, a lower quantity of pesos is needed to acquire an equivalent amount of foreign currency in order to meet interest and payment commitments that have come due. The elements or variables that affect economic conditions, such as supply and demand, may produce fluctuations in exchange rates, which can be brought about by a wide number of reasons. The following are some of the factors that might cause fluctuations in exchange rates:

2.5 Lending Rates and Term Structures

Alterations in interest rates have an impact on various currencies as well as exchange rates. If all other factors remain constant, when a country's national interest rate goes up, there will be a corresponding rise in demand for the country's own currency. This is because an increased number of foreign investors will seek to make investments at the higher rate. Nevertheless, in fact, this is compensated for by the ever-increasing cost of commodities.

2.6 Inflationary Rates

Inflationary pressures have an impact on the worth of currencies and their exchange rates. While he had the vision to include mathematical notions in almost all of his theories, he did not do so until after clearly stating the fundamental ideas in plain English. When a country's inflation rate is high, the local currency is less in demand

because its value drops much faster than the prices of other foreign currencies over time.

2.7 National Deficit

The total amount that the federal government owes is called "government debt." When a country has more debt, it is harder for it to get investment from other countries. Because of this, there will be more pressure on the value of the currency to go up because of inflation. Because of this, both the worth of the country's currency and the exchange rate will go down.

2.8 Stability on the Political Front

The worth of a country's currency as well as the pace at which it fluctuates are influenced by the capacity of the nation to entice potential foreign investment and the degree to which the nation's political climate is stable or unstable. During times of political unrest, investors are put in a more precarious position since they are unable to determine whether or not their finances will be protected by ethical business practices or a strong legal scheme.

2.9 Activities in Export and Import

When figuring out how much a country's exchange rates are worth, one thing that is taken into account is how much of a net trade balance the country has with its trading partners. The value of a nation's currency tends to increase when that nation's exports of products to other countries are greater than the items it purchases from other nations. As a consequence of this, the value of the currency used in that nation increases in comparison to the values of other international currencies.

2.10 Depression

As a country's desirability wanes during a recession, it becomes more difficult to attract foreign investment. Investing in an economy with a bleak future offers a greater level of risk, which might be one cause for this phenomenon. Once interest rates are relatively low, foreign investors have less of a desire to acquire the country's currency.

2.11 Speculation

Regardless of the reason, investors tend to accumulate more of a country's currency in the hope that its value will continue to rise. People could be persuaded to hold onto their own money rather than initially depending on cash from other countries as an outcome of this argument.

2.12 Particular Considerations

The exchange rate must be determined by taking into account a large number of other parameters. When the outlook for the economy of the whole world is uncertain, some "safe-haven" currencies, like the US dollar, for instance, draw in foreign capital because they are seen as stable. If a country's interest rate goes up, more people will want to buy things from that country for the nation's local currency, assuming that all other factors remain unchanged. The position of the United States dollar as the reserve currency for governments across the globe, which makes it more valuable than other currencies, is another feature that sets it apart. The present global economic structure is highly globalized as a result of globalization. The importance of the currency exchange rate just cannot be emphasized enough in any way. The market's participation and features determine the exchange rate's importance Kallianiotis, (2013). Moreover, it is important since it affects macroeconomic policy and business operations, making it a crucial point to take into account while making financial choices. Pilbeam (1991) explains that the exchange rate is a kind of economic policy tool. The significance of currency exchange rates on a country's economy is difficult to exaggerate. Improving a country's competitiveness is the primary objective of employing exchange rate management as a strategic economic instrument. A stable, competitive, and appropriately flexible exchange rate may aid in economic progress.

2.13 Empirical Literature Review

The relationship between South Africa's rate of exchange, rate of unemployment, and inflation rate is examined by Semosa and Kanayo (2021). Cointegration techniques were employed to identify the connection between the variables. In order to ascertain the outcome of the causality evaluation as well as how the variables responded to the

exogenous shocks, the Engle-Granger test (causality) and the response curve of the variable (impulse) were combined. Combining the two strategies made this possible. The results suggest there is a link connecting inflation and unemployment, and it appears it is a negative one. However, it has been shown that inflation and the value of currencies are positively correlated with one another. This demonstrates that the nation is struggling to address the issues surrounding the trade-off involving price hikes and joblessness, which is a difficult topic to address concurrently since it necessitates careful evaluation of opposing goals. It is now extremely essential to put in place a set of policies that will flatten the curves and allow the economy to run normally. In order to incorporate exchange rate volatility, Ken Miyajima (2020) extends a popular estimation approach of currency rate pass-through to inflation. Ken Miyajima conducted the research in question. The predicted results imply that rising exchange rate variations, albeit only to a very limited extent, tend to increase total inflation in South Africa. This is due to how little inflation is actually brought on by exchange rate fluctuations. This is the conclusion that may be drawn based on the association among the two variables that was discovered. This conclusion supports the concept that the rand should be allowed to float freely and serve as an absorbent material. Implementing this technique shouldn't be a problem because it is compatible with the nation's current, successful inflation targeting system. After controlling for factors like trade liberalization, government spending, and reserves of foreign currencies, Gautam et al. (2020) analyzed data for the period beginning in the initial quarter of 1994 and finishing in the second quarter of 2019 to determine the connection between the effective nominal exchange rate and capital flows. Among the powerful econometric tools they used were the Granger Causality Test and the Augmented Dickey-Fuller Unit Root Test. The information offered here comes from several institutions and organizations, such as the IMF's own data collection, the World Bank, the Reserve Bank of India, and the Organization for Economic Cooperation and Development (OECD). In this study, we tested the hypothesis that foreign direct investment (FPI), trade openness, and reserve status will all positively correlate with the prevailing exchange rate. However, the data show that none of the BRICS nations' actual foreign exchange rates are significantly statistically impacted by FDI. Additionally, the rate of change from an unstable to a balanced state during the current calendar year is

11.15 percent in Russia, 14.53 percent in India, 8.13% in South Africa, etc. As indicated by Hoang et al. (2020), changes in the value of the Vietnamese doing had a major impact on inflation and economic growth in the nation between 2005 and 2018. Researchers look at how changes in inflation and economic growth, as well as currency rates, affect the model's external parameters. The research group will propose a few points of discussion to aid in the development of Vietnam's economy as well as the enhancement of the country's macroeconomic setting, trade balance, and inflation management. Additionally, they will offer suggestions for how to carry out the objective of macroeconomic equilibrium in a way that is appropriate for the era of economic globalization and the development of national power. The quantitative outcomes will serve as the foundation for these suggestions. To determine whether the exchange rate is correlated with South African stock market prices, Ncanywa and O. Ralarala (2019) analyzed monthly data from 2006 to 2016. The researchers looked at data from 2006–2016. First, we ran a series of unit root tests, using both the most recent iterations of the Dickey-Fuller and Phillips-Perron methods. The purpose of these tests was to investigate the possibility that the length of the series model displayed stationary behavior. To run the GARCH model, we first used the ARCH test to verify the presence of heteroscedasticity in the data. Stock market declines were predicted with absolute certainty by the GARCH model's findings when the dollar strengthened against other currencies. The results of Johansen's cointegration test demonstrate a correlation between exchange rates and stock market values over longer time periods. As time went on, it became clear that there was a link between the two. The market value of a company's shares may be affected by fluctuations in the currency rate due to the large number of international investors trading on the Johannesburg Stock Exchange. Because of this, it is highly recommended that the South African Reserve Bank adopt measures to protect the value of the South African rand. Sanusi, Kapenguria, and their 2022 paper This article analyzes the interplay between oil prices, the rand/dollar exchange rate, and the outcome of the South African stock market over time. These models include the multivariate Markov regime-switching approach, the time regime-switching variable VAR model, and the DCC-GARCH model. With the help of monthly information on changes in oil prices, exchange rates for currencies, and market capitalization, we

evaluated the stock market's performance between 2003 and 2019. The years 2003 through 2019—both years—were covered by our study. The DCC-GARCH model's findings showed that, with only a few notable outliers, the fluctuating conditioned relationship between each of the variables was very stable. There is feedback connecting the value of oil price and the performance of the stock market, according to empirical results acquired through the application of time-varying vector autoregression. The dynamic Markov-switching VAR model's findings indicate that throughout the period of the boom, the price of oil was significantly influenced by both the equal of market capitalization and the exchange rate. The study's findings suggest that the stock market's performance can significantly aid policymakers in minimizing sudden increases in the price of oil. The study's findings led to the conclusion that was reached. Given South Africa's major reliance on oil imports, it is essential to understand the relationship between the cost of oil, how things are going in the stock market generally and with exchange rates.

This is due to the fact that South Africa must import a lot of oil to function. Some of the repercussions of oil's rising price include a decrease in the standard of living and a rise in the prices of goods and services (inflation), which has various overlapping ramifications for a variety of different sections of the economy. In recent years, the rise in the cost of petroleum has had a variety of overlapping effects on numerous distinct economic sectors. The prevailing consensus is that the growth in oil prices will additionally have a detrimental effect on the Rand's external value. As a result, potentially harmful signals may be transmitted to stock market investors from other countries, which could negatively affect the stock market's performance. If policymakers had a more solid scientific basis for understanding the link between oil price volatility and other economic factors, they could be better equipped to craft mitigation methods to reduce the effect of this volatility. If these steps were taken, the consequences of oil price swings on other economic difficulties would be lessened. Takawira (2021) looked at how changes in the South African stock market affected the value of the rand. This is the first point in the period of time that will be examined. The quarterly data was analyzed using an autoregressive distributed lag model, which takes into account the integration order of the variables. The submitted data were analyzed

using this model. When compared to previous research, this one used not just the linear but also the non-linear variants of the ARDL. The numerous presumptions regarding how the components interacted that were available in the academic literature made this possible. Empirical evidence demonstrating a long-term relationship between the variables of interest supports both the non-linear and linear models. The fact that there has been a consistent relationship between the key variables throughout the years demonstrates this. Additionally, the data demonstrates that there is a negative correlation between changes in exchange rates and shifts in the stock market. The negative impact of currency exchange rates was shown to be far more pronounced than the positive effect, according to the non-linear autoregressive distributed lag (NARDL) model. This conclusion stems from what the researchers discovered. Granger's theory of causation provides further support for the hypothesis that the exchange rate influences the stock market in a way that is causally tied to the latter. It is possible to infer from these findings that fluctuations in exchange rates have an effect on the success of the stock market. Employees in the financial sector and government officials with responsibility for fiscal policy should be aware of this and avoid inadvertently influencing stock prices by intervening in the foreign exchange market.

Ndou (2022) uses the Johansen cointegration and Engle-Granger methods to investigate the impacts of long-term exchange rate fluctuations on South Africa's export volume during the period of inflation targeting. To what extent the worldwide financial crisis of 2007 and the subsequent rise in public debt and borrowing costs after 2008 affected the magnitudes of the factors that determine export volumes is the focus of this essay. There seems to be a connection between the volume of exports, the applicable exchange rate, and the total inflow of foreign currency, as shown by both sets of data. The long-term implications of the exchange rate are far more important than the immediate ones. The overall number of exports is significantly more influenced by the desire to generate income from other nations than it is by the present exchange rate. Existing data suggests that the global financial crisis that started in 2007 moderated the effect of the depreciation of the currency on exports while amplifying the effect of the revaluation on the need to seek finance from outside. This suggests that boosting exports as a means of achieving external adjustment via the exchange rate alone may be

ineffective. Legislators, in order to protect the financial interests of their constituents, would do well to establish regulations that decrease the volatility of the exchange rate. This is especially true now, since the global economic crisis has compounded the detrimental impacts of a fluctuating exchange rate on export volumes. South Africa's loss of cost flexibility during the crisis may be seen in the CPI rather than the exchange rate, which better conveys the negative impacts of the global financial crisis on export volumes. The 2008 financial crisis that began worldwide has not yet been resolved. Following the fourth quarter of 2008, a rise in the level of public debt and a rise in the cost of borrowing were more effectively conveyed to lower export volumes through exchange rates than through comparable pricing ratios. The shocks brought on by the rising debt load are not being transmitted to export levels through the channel of fluctuating foreign exchange rates.

Patel and Mah (2018) investigate the potential for a connection between rising nominal currency exchange rates and South African economic growth. This study looked at the years 1980 through 2015 using a time-series methodology. Data collection began with the International Monetary Fund, continued with the South African Reserve Bank, and finally ended at the International Financial Statistics Institute. Throughout the investigation, a wide variety of statistical methods were used. Methods for estimating VEC models included the Granger causality test, impulse reaction analysis, variance decomposition, Johansen co-integration, and others. The real exchange rate was shown to have a statistically significant negative association with long-term economic growth and exports based on data from a collection of findings encompassing the years 1980–2015. The data was used to demonstrate this. This connection was discovered by the results of the lengthy study, the variance breakdown, and the impulse response function, were all applied with the aim of providing accurate predictions in this particular circumstance. The real rate of exchange, growth in the economy, and exports were found to have a strong and adverse link when the data were examined over a longer period of time. It would be extremely promising if the actual exchange rate was positively correlated with the total amount of cash in circulation and direct foreign investment. For such a short time frame, only exports showed a positive association with the market exchange rate. Results from a Granger causality test indicate that shifts in exports are the

only factor influencing the current exchange rate. Studying the correlation between the two factors led researchers to this conclusion. Given this, it's probable that the current exchange rate is directly related to exports. The results of the variance decomposition analysis showed that shocks caused by the growing size of the economy had a significant impact on the real exchange rate. After looking into spontaneous reaction mechanisms, I found that economic shocks that affect the actual exchange rate also affect the total amount of money in circulation, which is beneficial to the real exchange rate. However, the real exchange rate falls as economic activity rises, having the opposite impact. Increases in GDP, exports, imports, the money supply, and the value of the rand are all bolstered by a variety of factors, one of which is FDI. The assistance the government provides to these industries makes all of these things feasible.

According to Muzekenyi et al. (2019), even if there may have been brief periods of higher rates of exchange and economic growth in Africa, the continent still lags behind in terms of its effectiveness in international trade as exchange rate volatility rises. Because of this, emerging countries are at the center of the discussion on whether a nation should have a strong or weak currency. This analysis looks at the correlation between real exchange rates and the expansion of the South African economy from Q1 1994 to Q4 2015. The study's time frame encompassed the years 1994 to 2015. This was carried out because there is no doubt that changes in rates of exchange have an impact on how quickly a country's GDP grows. The period from 1994 through 2015 was included in the study's time frame since it was important to the study's conclusions. The examination in this study was focused on the years 1994 until 2015. The study's coverage period ran from 1994 to 2015. We used a VECM to look at the relationship over time. Three different statistical methods—the co-integration test, the Augmented Dickey-Fuller test, and the Philip Peron test—were used to analyze the strength of the connection. Time series analyses were a part of each of these research endeavors. The present exchange rate negatively affects South Africa's GDP growth both in the long run and in the short run, as shown by the VECM research. This is true in both the near and distant futures. This is true not only for the foreseeable future but for all time. Since this is the case, the hypothesis put forward in the literature suggests that a rise in the selling price of money, also known as a rise in the rate of exchange, is probable and may be an

effective expanding monetary weapon for the aim of improving economic development. Foreign investment, stable exchange rates, and the ability to rein in imported inflation are all ways in which a strong currency helps the economy flourish now and in the future. Conclusions call for a fixed exchange rate system to replace the country's current variable rate, which was put in place in 2000. A strong currency is also a useful tool for enterprises that export goods and for paying off international obligations. In order to determine whether economic growth and exchange rates might be related, Pramanik and Subhajit (2021) did a comparative analysis. In different contexts, inflation, gross domestic product, and economic expansion have all been considered growth factors. The nominal as well as real exchange rates have also been analyzed in a manner similar to this based on specific conditions. We can also see how machine learning is being used in this case to find correlations between short- and long-term time horizons. Other empirical investigations and data analyses carried out by other economists have also been combined here in order to more accurately map the overall picture.

Muziwakhe and Khomo (2018) focused on how the real effective exchange rate (REER) affects trade and GDP growth as well as how it differs from country to country. In his research regarding South African currency values. South Africa served as the location for this study. This study was conducted with the hypothesis that exports could support economic expansion through the use of reflexive exchange rate management techniques that highlight exchange fluctuations and artificially devalue currencies. Many questions about the effects of the exchange rate's movements on the economy have not been addressed in the context of South Africa, which is dealing with sluggish economic progress, massive unemployment, and extreme inequalities. Therefore, the crucial question is whether South Africa's monetary policy can be used to support exports, thereby fostering economic growth and job creation. I replicate exchange rate imbalances and volatility to examine their effects on development and exports, paying particular attention to potential discrepancies in how different economies may react to periods of underestimation and overvaluation. The results are presented in four essays. In the first article, the deeply suitable equilibrium value of the rand is calculated using the behavioral optimum exchange rate (BEER) technique and co-integration strategies. Then, a connection is made between the real exchange rate and the threshold used to

represent swings in the currency markets. To do so, we compare the level to the true exchange rate. An essential tenet of this method is the premise that the exchange rate in use is not the same as the one that is really in use. Then, a Markov regime-switching method is used to determine whether the exchange rate is too high or too low, based on how much it deviates from equilibrium. There is an allowance for this separation. A comparison of the rate's deviation from its equilibrium value reveals this. Economic variables such as trade conditions, access to the whole globe, and capital flows from the rest of the world, as well as the real effective exchange rate (REER) of the rand, are shown to be responsible for the observed link and the equilibrium in government expenditure. The actual exchange rates during the research period (1985–2018) frequently deviated from the assumed equilibrium level. The Markov regime-switching framework correctly portrayed the ensuing disparity as numerous instances of exchange rate exaggeration and undervaluation. Rather than the outcome of intentional policy actions. They originate either from South Africa's economy or from abroad. The exchange rate is an important socioeconomic issue that affects both international trade and the economies of individual nations, according to a study by Morina et al. (2020). Variations in the exchange rates of several currencies are becoming more obvious as global trade expands. The purpose of this research is to quantify the impact of real exchange rate fluctuations on GDP growth across a variety of countries and regions in Central and Eastern Europe. The effects of fluctuating exchange rates on GDP growth are analyzed, along with the ramifications of three different courses of action. It's important to emphasize the influence that the investigated economic shocks had in creating the discrepancy. In order to evaluate the nature and extent of the changes that affect economic growth, researchers analyzed annual data from 14 countries in Central and Eastern Europe between 2002 and 2018. By analyzing panel data and using mathematical models with fixed effects, the researchers concluded that fluctuations in exchange rates had a substantial negative impact on real economic growth. When compared to the average deviation and the z-score, two additional measures of exchange rate irrationality, the results seem to be correct. This article argues that the government should take various measures to maintain the stability of the currency rate in order to foster economic growth.

Decision-makers may find the research valuable in identifying, creating, and implementing successful strategies for the country's economic development. Their study, published in Chiadikobi et al. (2019), aimed to measure the extent of exchange rate fluctuations and investigate their impact on economic development in Ghana. Between 1983 and 2010, the probe collected data (Khan, 2021). Several metrics, including per capita GDP, physical capital stock, trade openness, exchange rate volatility, and human capital stock, reflected cause for alarm. To recreate the volatility of the exchange rate, Engle and Bollerslev developed the ARCH and GARCH models in 1982 and 1986, respectively, using the monthly data gathered from January 1983 through December 2010. Examining fluctuations in currency values led to the identification of new factors, which were then included in the development model. This action was taken to improve the accuracy of economic forecasts for the future. The auto-regressive distributed lag method was used for the time series analysis portion of the research. This method was used to examine whether or not the rise in the size of the Ghanaian economy was correlated with the value of the cedi. The Peaseran Group (2002) Based on our research, we concluded that swings in the value of the currency exchange market had a major negative impact on economic growth over the long and short term. This is a consequence of the considerable risk associated with investing, which impedes trade and advancement on a global scale. As a piece of advice, governments should work to maintain the exchange rate because increasing trade and investment will lead to strong economic success. Again, for increased output, policymakers must support domestic industry. When the domestic manufacturing industry is strengthened, imports will decrease. Grants and subsidies should be given to local businesses in addition to encouraging exports, as this will boost trade and improve the economy. Since the beginning of the economic reform program in 1986, the exchange rate policy has been the primary driver propelling economic development in Nigeria, as reported by Anyanwu et al. (2017). Around the same time, the value of the local currency dropped in relation to the dollar. The effects of real exchange rate variations on Nigeria's GDP and industrial production are assessed using data from 1986–2015. The 2015 statistics weekly from the Central Bank of Nigeria was mined for the time series data used in the Ramsey sensitivity analysis. This information was analyzed. The data passes the

stationarity test. Multi-collinearity testing, serial relationship testing, heteroskedasticity testing, and a reset specification were all a part of the OLS estimation procedure used to calculate the estimated values of the derived products. Johansen's work on co-integration suggests a connection between GDP growth and currency policy over the long run. Evidence suggests a correlation between real GDP and the real exchange rate, as measured by pairwise Granger causality analysis. The examination of the correlation between the GDP per capita and the exchange rate demonstrates that the latter significantly affects the former.

According to pairwise Granger causality, the real GDP is significantly impacted by the actual exchange rate, and there is a minor but positive relationship between the two variables. The Central Bank of Nigeria will need to develop some standards for the nation's currency exchange strategy if it wants to maintain the naira's value in relation to other currencies. The Central Bank of Nigeria should enact strict restrictions surrounding its foreign exchange strategy in order to ensure that the value of the naira is appropriately established in comparison to that of other currencies. Local producers should receive tax incentives and subsidies in order to increase their output. An industrial strategy must be implemented in order to integrate agriculture and industry and increase export earnings. AMIRDHAVASANI SELVAM, KATHIRAVAN, and SIGO (2019) conducted this study to better understand the nature of the relationship between the real exchange rate and the economic development drivers in the Asia-Pacific region. Every three months between 2006 and 2017, we conducted the Granger Causality Test on the sample economies to see whether there was a correlation between the dependent variable and the independent factors. The analysis found no correlation between any of the variables in the majority of the nations. This indicates that the variables are not related in any way that may be considered causative. This demonstrates that the parameters are not linked in any way that could be considered causal. To further understand the connection between the RER and growing GDP, AMIRDHAVASANI, SELVAM, and KATHIRAVAN (2019) examined this phenomenon in 10 nations in the Asia-Pacific area. This research aimed to examine the link between RER and GDP growth (EG) to get a better understanding of the two variables and their interplay. They were particularly interested in comprehending the connection between RER and EG.

The analysis conducted for this piece of research was focused on the cumulative relationship between RER and other indicators of economic progress, including FER, GDP, exports, and imports.ER was discovered to be positively connected with FER, GDP, exports, and imports in every single one of the ten countries that this study looked at. According to pairwise Granger causality, the real GDP is significantly impacted by the actual exchange rate, and there is a minor but positive relationship between the two variables. The Central Bank of Nigeria will need to develop some standards for the nation's currency exchange strategy if it wants to maintain the naira's value in relation to other currencies. The Central Bank of Nigeria should enact strict restrictions surrounding its foreign exchange strategy in order to ensure that the value of the naira is appropriately established in comparison to that of other currencies. Local producers should receive tax incentives and subsidies in order to increase their output. An industrial strategy must be implemented in order to integrate agriculture and industry and increase export earnings. AMIRDHAVASANI SELVAM, KATHIRAVAN, and SIGO (2019) conducted this study to better understand the nature of the relationship between the real exchange rate and the economic development drivers in the Asia-Pacific region. Every three months between 2006 and 2017, we conducted the Granger Causality Test on the sample economies to see whether there was a correlation between the dependent variable and the independent factors. The analysis found no correlation between any of the variables in the majority of the nations. This indicates that the variables are not related in any way that may be considered causative. This demonstrates that the parameters are not linked in any way that could be considered causal. To further understand the connection between the RER and growing GDP, AMIRDHAVASANI, SELVAM, and KATHIRAVAN (2019) examined this phenomenon in 10 nations in the Asia-Pacific area. This research aimed to examine the link between RER and GDP growth (EG) to get a better understanding of the two variables and their interplay. They were particularly interested in comprehending the connection between RER and EG. The analysis conducted for this piece of research was focused on the cumulative relationship between RER and other indicators of economic progress, including FER, GDP, exports, and imports.ER was discovered to be positively connected with FER, GDP, exports, and imports in every single one of the ten countries that this study looked

at. That was the decision that was made. Variations in the exchange rates of foreign currencies in places like Thailand and Hong Kong have an impact on export revenues. However, over the extended time of the study, Japan was the sole nation where no relationship involving RER and growth in economic statistics was found. The benefits of increasing economic activity are well known. Increases in both inflation and the underlying value of the price of a foreign currency are predicted to occur after an inflationary period, as indicated by Karahan (2020). An increase in the exchange rate encourages economic expansion by allowing more money to flow out of the country. This promotes additional economic growth by boosting demand across the board. On the other hand, structural economics argues that traditional wisdom about currency evaluation and GDP growth is untrue. When exchange rates increase, the value of imported goods increases as well, which is bad for the economy's expansion. This is especially true in emerging countries, since the foundation of production depends on investment and intermediary goods imported from other areas of the world. The inflation targeting (IT) mechanism has controlled the Republic of Turkey's monetary policy since 2002 and allows the exchange rate of the nation's foreign currencies to fluctuate. Exchange rates are said to have a negative impact on economic growth by economists who prefer to view the economy as an ensemble of interconnected elements, and there is research to support this claim. It is possible to argue that price stability and exchange rate stability must be delivered concurrently in terms of policy given the inflation targeting method used by Turkey. That was the decision that was made. Variations in the exchange rates of foreign currencies in places like Thailand and Hong Kong have an impact on export revenues. However, over the extended time of the study, Japan was the sole nation where no relationship involving RER and growth in economic statistics was found. The benefits of increasing economic activity are well known. This promotes additional economic growth by boosting demand across the board. On the other hand, structural economics argues that traditional wisdom about currency evaluation and GDP growth is untrue. When exchange rates increase, the value of imported goods increases as well, which is bad for the economy's expansion. This is especially true in emerging countries, since the foundation of production depends on investment and intermediary goods imported from other areas of the world.

Between 1997 and 2017, Murtadho and Bhaumik (2020) looked at the relationship between changes in the purchasing power of the naira and the nation's general pace of economic growth. Their objective was to ascertain the degree to which changes in the purchasing power of the naira had an impact on Nigeria's economic growth. According to the study's results, the Central Bank of Nigeria (CBN)'s Monetary Policy Committee has to do more to rein in inflation. According to Dumre and Karki's (2020) research This study's findings add to the growing body of literature suggesting that economists can't agree on whether or not inflation influences economic expansion. This is demonstrated by the absence of consensus in this study. The age-old argument of whether inflation typically promotes or inhibits economic growth has no conclusive conclusion. There have been a lot of arguments on both sides. In the opinion of the majority of experts, modest and consistent inflation is good for the economy, whereas high inflation stifles growth. However, almost everyone is aware that high inflation may harm a sector of the economy. The assumption that there is an ideal rate of inflation for the growth of Nepal's economy is strongly supported by research results. According to the results of several studies, inflation in Nepal should start at a rate of roughly 6%. Inflation begins to harm the economy once it hits a certain rate threshold. Before actions are taken to reduce poverty and promote economic development, inflation must be under control. Measures must be taken to maintain the inflation goal range near the ideal inflation rate in order to speed up economic growth and guarantee that inflation's negative effects on the nation's finances are minimized to a minimum. This will guarantee that economic expansion is unhindered. Hoang Tien Nguyen (2021) The Vietnamese government places a high priority on inflation adjustment when formulating and implementing programs. This is being done to encourage both an increase in GDP and economic stability. Finding the benchmark in the link between inflation and GDP growth is crucial before giving a fair proposal regarding a suitable inflation rate. Historical data may be consulted to accomplish this. There is a link between price increases and the expansion of an industry as a whole.

In this essay, the relationship between increasing costs and an expanding GDP in Vietnam is examined in further depth. The Vietnamese economy is the main subject. It's possible that there is no straight structure to the link involving inflation and GDP

growth. The results corroborate the theory that inflation is fixed at 6% and show that extremes of either too high or too low volatility outside the criterion have a substantial detrimental effect on GDP expansion. Global analysis shows that inflation dampens economic expansion. This study suggests that if the Vietnamese government wants to increase GDP, it should aim for an inflation rate of 6%. The impacts of inflation on economic expansion, both in the past and now, are studied by Haliru and Basiru (2021) (1973–2019). The primary objective of this research is to draw a conclusion on the relationship between rising inflation and economic growth in South Africa during the course of the study period. Secondary sources were used in this study, including figures from the Border Services Agency of Canada and development indicators from the World Bank. Multiple linear regression (MLR) as well as correlation were used as analytical techniques. We looked at the information for State 14. However, although EXR does have a sizable and positive influence on GDP, the data indicated that INFR has a massively negative effect on GDP. The main premise of this study was to show how inflation hinders economic development. When asked how the government might accomplish its stated aim of "certain degree of economic growth," the inquiry ultimately recommends an expansionary monetary policy. The government should also prohibit wasteful expenditures by its representatives. It is a widely held idea that a nation's economic success is assisted by a rate of inflation that is both low and steady, according to M. W. Madurapperuma (2016). When inflation is low, people are more likely to save money, which in turn increases investment and speeds up the overall development of the nation's economy. The main goal of the study is to draw conclusions about the extent to which the Johansen co-integration test can be used in conjunction with the overall framework of the error correction model and whether or not there is a linear relationship between the two variables from 1988 to 2015. The study's results will be presented in this way. how the level of inflation affected Sri Lanka's economy's growth. The study will focus on the years 1988 through 2015, to be more precise.

CHAPTER III

3.0. Methodology

 3.1. Introduction

          The many methods, procedures, and strategies that were used to gather the crucial data for the investigation are fully explained in this section of the research. This piece of research is located in the middle of the book. The purpose of this investigation was to gather more data to back up the results of previous investigations. There were many different statistical methods utilized to evaluate the data for this component of the study, and we analyzed and investigated them all as part of our bigger research endeavor. The information acquired throughout the study was used to conduct this assessment. The information and data gathered over the duration of the study were evaluated using these methods of operation.

3.2 Data

          This part of the study provides a thorough explanation of the many techniques, steps, and tactics employed to collect the vital information for the inquiry. This portion of the research is located in the text's middle. The purpose of this study was to gather more evidence to back up the conclusions of the other investigations. We also looked into and evaluated the various statistical methods that were utilized for analyzing the information that was gathered for this specific portion of the study as a component of the larger research endeavor. This evaluation was carried out using the data gathered during the investigation. These techniques of operation were used to assess the data and information that were obtained over the course of the investigation.

3.3 Variables

          The study team had access to the data needed to compute the independent as well as the dependent variables using the World Bank's online indicator database. The information needed for the research was gathered using this database. Few variables were supplied in forms that were inconsistent with the techniques required to accomplish the research's objectives, while the great majority of the factors were presented in

patterns that could be employed to accomplish the thesis's goals. We considered the expansion of GDP as one of the variables that were dependent on the research to assess the current status of the economy. Along with the stock market, currency rate, rates of interest, and inflation, this was also done. To assess the manner in which the economy is doing, this was done. All of these things were taken into account. We examined the following factors:

3.4 GDP's

Prices in the local currency are used to compute the annual percentage growth rate. The amounts are computed using 2015's uniform prices and, for display purposes, converted to US dollars. The entire surplus value produced by each member of the economy who is a manufacturer is added to the relevant product taxes, less any unaccounted-for help, to determine the gross domestic product (GDP). Then, any applicable goods taxes are increased by this amount. It is an estimate that does not account for the deterioration of natural resources over time or the decline in value of manufactured assets. The quantity of money that each nation's producers have contributed to the economy overall is known as its gross domestic product (GDP). Before analyzing the significance of fixed capital to the manufacturing process, the value added is first calculated by taking the entire output of producers and removing the cost of all intermediary goods and services from that amount. According to the requirements of the United Nations System of National Accounts, extra value must be included in either the basic costs (which do not take into account the net taxes that are applied to items) or the prices that are charged by suppliers. The net taxes imposed on the goods are not considered in any of these possibilities. It is advised to generate these numbers at random. (The net taxes paid by producers are included; sales taxes and utilization-based taxes are not.) These figures do not account for the overall cost of transportation, which is something that manufacturers bill consumers separately for. The purchaser's price index is used to calculate GDP on an overall basis. When calculating the value addition produced by industry, it is customary to compare the value addition to the base price. The price paid by the producer is included in the value-added calculation. The least-squares method is paired with information on prices that have stayed constant

and have been represented in the country's own currency to calculate the gross domestic product (GDP) and the growth rates of its component portions. This makes it possible to compare the growth rates of the GDP and its constituent portions. The growth rates are estimated in US dollars for each region and income level with the presumption that prices will stay the same. When converting a local currency series into a fixed amount of US dollars, a common reference-year exchange rate is used. The rate of rise in value added over time is a useful indicator of how much various kinds of companies have contributed to the expansion of the economy as a whole. Theoretically, using a set of prices from the initial year, production might be gauged and then priced. The value of the final product may then be calculated by deducting it from the value of the additional inputs, which are likewise valued using constant pricing. A detailed understanding of the pricing mechanisms for inputs and outputs is necessary for this double-deflation strategy. Even so, a wide variety of enterprises routinely estimate value added from the base year using single-volume output indices or, less often, input indices. When determining value added at constant prices, it is common practice to attribute a portion of the result to labor inputs such as real salary or headcount.

This is especially prevalent in the service industries, which account for the bulk of the government's workforce. Measuring the growth of services is difficult since there are not yet any accurate indicators for the production of work. Because of advances in technology, the quality of goods and services may also improve. But if these changes are not appropriately accounted for, they may distort measurements of value added and, as a consequence, development. In the case of nonmarket services, when outputs are estimated using inputs, this phrase describes the situation, technical improvements that can't be measured because output estimates to be too low. In a similar way, quality improvements that are not measured lead to an underestimation of productivity and value created. Because of a direct consequence of this, growth and advances in productivity may be overestimated, while inflation may be significantly understated. Particular measuring challenges are presented by informal economic activity, particularly in developing nations where a large portion of economic activity goes unreported. It must be estimated household outputs for domestic consumption in addition to in order to provide a comprehensive view of the economy, it is necessary to

account for sales that take place in unofficial markets, transactions that include barter, and operations that are either unlawful or purposely not reported. This is because these other types of economic activity are not accounted for in official statistics. Such estimates' consistency and thoroughness rely on the compiling statisticians' techniques and skills. The recorded growth rate of an economy may change as a result of rebasing national accounts, and series breakdowns that disrupt the continuity of the data across time might result. In order to more accurately represent current production or consumption trends, governments update the weights given to individual components when they rebase their national accounts. The new base year ought to reflect the economy's typical behavior; it ought to be a year devoid of important shocks or misrepresentations. Numerous evolving nations have long since stopped rebasing their national accounts. By adopting an older base year, you run the risk of being deceived due to the fact that implicit price and volume weights eventually lose their relevance and their benefits. In order to obtain equivalent sequences of data at constant prices that can be used to figure out statistics, the World Bank changes the gross domestic product along with the value added by manufacturing origin to a shared reference year. This is done so that the data can be compared to one another. This is done so that the data may be compared. As a result of rescaling, the inherent weights that are utilized in the production of regional and income-based aggregates have been altered, which means that aggregate expansion rates cannot be compared to those that were found in earlier versions with different foundation years. This is because previous editions had different base years. Both the rescaled gross domestic product (GDP) and the total of the rescaled components could end up having different values after the rescaling process is complete. It was determined not to distribute the difference in order to prevent any distortions in the growth rates that could have been caused by doing so. As a result of this, the growth rate of the GDP is not necessarily identical to the calculated average of the rate of expansion of its constituent pieces. This is because the GDP is comprised of many different components whose growth rates vary. This difference can have a big effect on economic policy.

3.5 Real Effective Exchange Rate

You may easily calculate the effective exchange rate by taking the theoretically successful rate, adding a price deflator or cost signal, and then subtracting the result from the theoretically successful exchange rate. You will then have access to the precise conversion rate that was applied. (Utilizing 2010 as the calculation's base year.) For the bulk of high-income countries, weights are derived via the exchange of manufactured goods between industrialized nations. In order to reach these results, we used both the nominal real exchange rate indices and an expenditure of equal standardized unit labor expenses in manufacturing. This made it possible for us to get the required results. The nominal actual rate of exchange index is computed by factoring in a nation's trade in manufactured goods and basic goods with its allies and rivals, among other countries. To account for equivalent changes in consumer prices, the corresponding nominal index for these countries' effective real exchange rates has been changed; an increased reading for this indicator suggests that the local currency's value has grown. Numerous economic expenses, including the real interest rate, real wage, and other decisions made by businesses and the government on how to allocate assets within a market-based economy, have an impact on people's choices. Comparable pricing, such as the actual exchange rate, impacts these choices. The proportionate price often reflects these brokers' judgments as well. Comparable values may thus reveal a lot about the interactions between various economic players, both inside a nation and between other countries.

3.6 Real Interest Rate

The borrowing interest rate that has been adjusted for inflation using the deflator of GDP is known as the "real interest rate". However, it may be difficult to compare loan rates between nations since the terms and circumstances that go along with them may vary from one to the next. In an economy, there is often a range of rates of interest that reflect competition in the market, laws governing loans and deposits, variances in the standings and classifications held by lenders and borrowers, as well as changes in the regulations regulating loans and deposits. The regulations or executive orders that determine interest rates might be interchangeable across various economies. It might be

challenging to get precise information regarding interest rates that indicates how the market is functioning when a nation's market isn't ideal or when no-interest rates don't coincide with effective rates. In certain nations, this could be true. The International Monetary Fund, also known as the IMF, gathers data on deposit and lending rates as an indication of the typical interest rates provided by local banks to customers. However, the restrictions and limitations that come with these rates vary from nation to nation, making it challenging to compare them. Real interest rates may be obtained by simply deducting an approximate estimate of the rate of inflation from the nominal rate of interest. The principle will have less buying power than previously if the actual rate of interest is negative. Divide I minus P by 1 plus P (as computed by the GDP deflator) to get the real interest rate. The following formula is obtained by substituting I for the nominal rate of interest on loans and P for the inflation rate. The International Monetary Fund (IMF) began offering new methods to show financial statistics to nations that send in data based on its Monetary Financial Statistics Handbook from 2000 in 2009. The format is unchanged for countries that publish data in accordance with their International Financial Statistics (IFS). Both the structure's net domestic liquidity and its net overseas holdings are included in the banking system's assets. The amount of financial system savings that represent obligations owed to both the private and public sectors is subtracted from the actual worth of such accounts. Net domestic credit accounts for borrowing by all three levels of government as well as the private sector. In addition, it takes into account the buying and selling of both short-term and long-term government securities, as well as the provision of loans to state-owned enterprises. The term "net domestic credit" is used to describe the sum of all loans made to domestic financial institutions (including banks and non-banks). One of the primary means through which the monetary base may be adjusted is via the domestic credit system. Most importantly, the Federal Reserve lends to the government. There is a possibility that the market interest rate and the cost of the central bank's loan programs for the banking sector would change as a result of the central bank's actions in the open market. Depending on the central bank's decisions, both the amount of credit that banks are permitted to provide to the private sector and the quantity of reserves imposed on banks are subject to change. A number of various economic models employ the true rate of interest as an

explanatory factor. These theories aim to explain capital flow, economic imbalances, and business cycles. Customers often have a tendency to cut back on their spending and boost their reserve contributions when credit is in high demand and when curiosity rates are high. The appetite for capital will shift away from investments and toward spending as well as investment at low real interest rates.

3.7 Market Capitalization

The value of a share is multiplied by the total number of units outstanding for determining a company's market capitalization that has been listed on the domestic exchange for stocks. This aggregate number of Shares includes all classes of Shares. Market capitalization is another term for market value. Capital funds, unitary trusts, and corporations, among others, whose main objective is to own shares of other publicly traded companies are excluded from this definition. Final statistics for the year make up the data. Other forms of shares, such as those lacking voting privileges and those of foreign companies that exclusively trade on one platform, are taken into account in predictions of the prevailing market value of the assets under consideration in addition to the more frequent common as well as special shares of domestic enterprises. This indicates that the overseas corporation's shares are not exchanged on any other platforms besides the one listed above. The figures used to calculate market capitalization do not take into account collective investment funds, rights, warrants, and exchange-traded funds (ETFs), convertible instruments, options, futures, or shares of international companies that are exclusively registered in the United States. You can't have one without the other. Efficient financial systems give people access to accurate and easy-to-find information, which can lead to lower transaction costs, better use of resources, and faster economic growth. The main thing that helps get people out of poverty is growth, which is fueled by both stock markets and banking systems. In the early stages of economic growth, commercial banks often have control over the monetary system However, in later phases, when the financial system is more established, domestic stock markets often outperform domestic banks in terms of activity and efficiency. Financial markets are greater in open governments with solid legal systems capable of regulating the economy and providing shareholder protection than in closed ones. Recent studies on

the development of the stock market have shown how globalization and technical advancement have increased the flow of money over international borders and the number of financial organizations with a worldwide presence, making the stock exchange more global. Cross-listing on foreign markets gives businesses in developing nations access to less expensive funding and frequently traded shares. This is a technique that is spreading quickly. The possibility that stocks markets in developing nations could not have enough financial activity to support them would increase the pressure on these exchanges to reconsider the business models that underpin their daily operations.

3.8 Inflation (GDP deflator)

The GDP implicit deflator's yearly growth rate is what's utilized to determine inflation. This serves as an example of how swiftly prices are changing throughout the whole economy. The variation among GDP in present local currency as well as GDP in steady local currency is multiplied by 100 to get the implicit deflator of GDP. This provides the GDP implicit deflator. The distinction in the local currency of today is that "Inflation" is the term used to describe the phenomenon of a rise in the average price of goods and services offered by a particular industry of the economy. Inflation is a term that is relevant to this situation. Buyers may be able to buy less overall with the same quantity of income if their spending limit stays the same if the average price of products and services rises. In the event that values grow overall, this is what will happen. The median cost and the average price have a relationship with one another, which is the cause of this.

Variables Description

Table 1.1

#	Variables	Abbreviation	Measurement	Source
1	Inflation, GDP deflator	INF	(annual %)	World Bank
2	Gross domestic product growth	GDP	(annual %)	World Bank
3	Real exchange rate	REER	(2010=100)	World Bank

4	Market capitalization of listed domestic companies	MC	(% of GDP)	World Bank
5	Real interest rate	RIR	(%)	World Bank

3.9 Model Specification

The present research examines the connection between economic growth (the dependent variable) and a number of other factors (the independent variables), such as the exchange rate, inflation, interest rates, and market capitalization. Tools from statistics and economics are used in the study. Descriptive statistics are first used to present the data in an appropriate and intelligible manner. An alternative method for assessing the integration procedure and the stationary variables is the unit root test. You must take the data's square root in order to perform this test. In the end, it will be decided if there are ties between the basic elements over both the short and long terms using the autoregressive distribution of lag (ARDL) model. These connections might be correlative or causative in nature. This formula may be used to determine if both types of interactions are present and how strong they are. A method for demonstrating a relationship that has several potential causes is the Granger causality test. The ADF unit root test was used to make sure that none of the variables could be confounded when using the ARDL model. I disagree with Ouattara's (2004) assertion that only variables that are steady after the second distinction has been made should be employed with the ARDL model. Since the rate of exchange, rates of interest, the market for stocks, and inflation are independent factors in the study, the following ARDL models are examined and the model definition is one of the phases that go into creating a statistical model. Prior to defining a model, choose the parameters that it will use and the functional form that best matches the model. Here, the variables inflation (INF), market capitalization (MC), and real interest rates (RIR) are used as independent variables in an analysis of the potential effects that real exchange rates (REER) may have on the growth of the South African economy. Acar (2000) has undergone a number of adjustments in light of the results of this study. Below is a formal description of the lower solution, which defines the model's result, for your convenience.

$$GDP_t = \beta_0 + \beta_1 REER_t + \beta_2 MC_t + \beta_3 INF_t + \beta_4 RIR_t + \varepsilon_t$$

Whereas: GDP is a short form for "gross domestic product." REER is an acronym for "real exchange rate." MC is an abbreviation for "market capitalization." INF is anacronym for "inflation," and RIR is an acronym for "real interest rate.". Ɛ the error term, t stands for the time interval, (1980-2020), β0, represent intercept and the β1...4 represents the coefficient of the independent variables.

3.10 Descriptive Statistics

Descriptive statistics are a kind of summary statistic that provides a numeric description of some characteristic of a dataset (in the sense of a count noun). According to Prem S. (1995), utilizing and analyzing descriptive statistics (in the sense of a mass noun) is the procedure. In opposition to the goal of using the data to make inferences about the community represented by the selection of data, the objective of a descriptive statistic is to provide an overview of a sample. This is a key difference between descriptive statistics and inferential statistics, also called "inductive statistics." Because of this, descriptive statistics are often nonparametric statistics that aren't based on probability theory like inferential statistics are. Douglas, Y. (2003). Even in cases where statistics are used in order to derive the core conclusions of data analysis, descriptive statistics are often still supplied as well. For instance, research that focuses on human participants will typically include a table that details the overall sample size, the number of samples in key subgroups (for example, for every treatment or contact group), and age group or clinical data, such as average ages, the proportion of subjects that are of each sex, the number of subjects that have related co-morbidities, and so on. Another example of this is that almost no research papers that report on studies done on animals include tables that show the size of the overall sample as well as the sample sizes of important subgroups (like for each treatment or exposure group). Metrics such as the information collection's central propensity are examples of metrics. Indicators and tests of fluctuation or dispersion are just two of the types of metrics that are frequently used in this endeavor. Another type of metric that is frequently used is the measurement of average value. There are three different ways to evaluate central tendency, mean, median, and mode. Techniques that may be utilized in the process of establishing a variable's degree of variability include the lowest and greatest values of the variables, as

well as kurtosis and skewness. The standard deviation, which is the same thing as the variance, is another way that can be employed. There are three alternative methods to measure central tendency: the average, the median, and the value that happens most frequently, which is the mode. The average, the median, and the mode are listed in the following order: average, median, mode.

3.11 Unit Root Test

The DF test needs to be replaced with the test for the unit root of the ADF, as it addresses more problems. In order to eliminate autocorrelation in the residuals, it also contains an extra latency component for the variable that is dependent. The Schwartz Information Criterion (SIC) is used to determine the additional work in this investigation. Even though the AIC sees the most action, the SIC is preferred due to its stringent requirements. Perron used the Phillips-Perron (1988) method, which Neath and Cavanaugh (1997) first described, to determine whether a variable has a unit root. The premise of the null assumption is that the outcome of a continuous process will be the most important variable. Contrarily, the alternative hypothesis asserts that the value that is significant has a unit root. According to the counterexample's reasoning, the variable at issue lacks a unit of measurement. To adjust for serial correlation, Perrion employs the standard errors from Newey-West (1987). Dfuller's enhanced Dickey-Fuller test, on the other hand, has additional waiting periods for the first-difference independent variable. Below are the equations for both the Reinforced Dicky-Fuller and Phillips-Perron unit root tests:

$$y_t = a_1 y_{t-2} + \cdots a_p y_{t-p} \varepsilon_t$$

3.12 ARDL Bond Test

Equations may be estimated using a variety of different econometric methodologies, as shown in the works of Gujarati (2003) and Veerbik (2004). (1). You may estimate equation (1) using the method of regular least squares, which ought to be quite simple if there are no modifications to any of the variables. (0). (OLS). On the other hand, the evidence must first be different, and then the normal least squares

approach must be applied to the unique variances before the OLS assessment can be done if any of the parameters are incorporated in order one, commonly known as I. This procedure occurs before doing the OLS analysis (1). One of a number of cointegration approaches may be used to determine if the components in the first equation really cointegrate. The two most frequently used techniques for analyzing cointegration are the two-step residual-based methodology suggested by Engel and Granger (1987) and the highest probability decreasing rank technique suggested by Johansen (1991, 1995). Engel and Granger were the ones who first developed both of these techniques. Before implementing either of these two choices, you must do some preliminary testing to guarantee that all regression coefficients are integral. This is necessary because the typical statistical inference generated from traditional tests of cointegration is no longer a valid source of information due to the presence of both I (0) and I (1) as explanatory variables. His is so because De Vita & Abbott (2004)'s stationary series is what the Johansen approach employs. Furthermore, neither of these two methods of cointegration can provide information that may be regarded as reliable when used on small samples. (2004) Narayan & Narayan. The approach used in this observational study was influenced by the work of Todani and Munyama (2004), De Vita and Abbott (2004), and Aguirre et al. (2003). It does this by using the ARDL Limits 10 testing strategy that was discussed by Pesaran et al. (2003), De Vita with Abbott (2004), and Todani and Munyama (2004). It does this by using the ARDL Limits 10 testing methodology, as described by Pesaran et al. (2005). (2001). When compared to both the highest probability decreased rank Johansen (1991, 1995) technique and the Engel as well as Granger (1987) method, the ARDL limits assessment approach also has the benefit of having superior small-sample characteristics. Long-run parameter estimates are exceedingly accurate even with small sample numbers, whereas short-run parameters predicted using OLS under the ARDL paradigm correspond with the corresponding square root of time. Shin and Pesaran (1999)

The equations are modelled into a conditional ARDL-ECM in order to carry out the limits testing technique as follows:

$$\Delta InGDP_t = \alpha_0 + \beta_1 InGDP_{t-1} + \beta_2 InREER_{t-1} + \beta_3 InMC_{t-1} + \beta_4 InRIR_{t-1}$$

$$+ \beta_5 InINF_{t-1} + \sum_{i=0}^{q} \Delta\alpha_1 \, InGDP_{t-k} + \sum_{i=0}^{p} \Delta\alpha_2 \, InREER_{t-k}$$

$$+ \sum_{i=0}^{p} \Delta\alpha_3 \, InMC_{t-k} + \sum_{i=0}^{p} \Delta\alpha_4 InRIR_{t-k}$$

$$+ \sum_{i=0}^{p} \Delta\alpha_5 InINF_{t-k}$$

$$\Delta GDP_t = \alpha_0 + \sum_{i=0}^{q} \Delta\beta_1 \, InGDP_{t-k} + \sum_{i=0}^{p} \Delta\beta_2 \, InREER_{t-k} + \sum_{i=0}^{p} \Delta\beta_3 \, InMC_{t-k}$$

$$+ \sum_{i=0}^{p} \Delta\beta_4 InRIR_{t-k} + \lambda ECM_{t-1} + \varepsilon_t$$

3.13 ARDL Model

The autoregressive model distributed lag (ARDL) technique is something that Pesaran and Smith came up with back in 1998, and then Pesaran and colleagues developed it again in 2006, is the technique that will be utilized in this research to examine the relationships that exist among the various variables. The distributed autoregressive lag (ARDL) method, originally proposed by Pesaran and Smith (1998) and Pesaran et al. (1998), will be used in this research to investigate the interrelationships between a large number of variables. Some examples of such variables are the rate of increase in the gross domestic product, the level of inflation, the level of interest rates, the level of stock market performance, and the purchasing power of the dollar in comparison to other currencies. These examples are combined to show the variety of these aspects. Examples include increases in the nation's gross domestic product (GDP), price increases, rates of interest, stock market success, and the simplicity of exchanging one currency for another. It is important to recognize Pesaran's as well as Smith's accomplishments in the development of ARDL. See Pesaran et al. (2001) as an example. This approach is said to have been created by Pesaran and Smith in the beginning. (1998). Although time-varying series variables may be frictionally integrated, I (0) integrated, or I (1) integrated, their practical application is not hindered in any way

by these differences. For a variety of reasons, including its ability to eliminate endogeneity problems and its superior performance for small sample sizes, the ARDL model was chosen as the best alternative by Pesaran et al. (2001). It is not necessary to account for any unavailable long-run data since error correction techniques allow for the simultaneous calculation of the short-run change as well as the long-run equilibrium. Both the variation over the short run as well as the fluctuation over the equilibrium of the long term may be accounted for by models that include error correction. These two actions may be carried out concurrently. Both of these advantages are concurrently attainable. Jalil and Mahmud, 2009.

3.14 Residual Diagnostic Tests

3.14.1 Serial Correlation

Williams et al. (2015) explains the idea of serial correlation in their research and it takes place when mistaken words from a number of different time periods are combined. As a result of this, the mistaken word is referred to as being serially associated. In time-series investigations, serial correlations often happen when mistakes from one time period spill over into subsequent ones. One of the many varieties of serial correlation is referred to as first-order serial correlation. Other varieties of serial correlation also exist. When using this particular approach to serial correlation, there is a clear link between errors from one time period and those from the next. Mistakes may also occur at a later time; if statistics are gathered every three months, for instance, a mistake in the autumn of one year may be linked to an error in the fall of the following year. When there is a positive relationship, errors that occurred during mistakes that were place in the future mistakes that occurred in the preceding time period have a positive correlation with errors that occurred in the current time period.

3.14.2 Normality Test

According to Gujarati and Porter (2009), the normality probability plot and the Jarque-Bera test are two more normality tests that have been written about. In addition to the most common histogram residuals, which were talked about in the last sentence, these tests are also done. Since the Jarque-Bera exam is a formal test, it was chosen for

this study's goals. (2014) Brooks the JB test is helpful for this investigation because it takes advantage of a property of a sample that has a normally distributed distribution, which is illustrated by the sample's first two moments, which are the mean and the deviation. The mean and variance quantify this normally distributed property. 2009 (Gujarati and Porter) On the other hand, the probability plot and the histogram residuals are two graphical tools that can be used to investigate and evaluate the shape of a variable's chance density function. Both of these tools are shown in comparison to the scatter plot. Because of this, they are not appropriate for the research that is being conducted

3.14.3 Heteroskedasticity

Williams (2015) uses the fact that OLS works on the hypothesis that V (j) = 2 for every j to explain what heteroskedasticity is. This indicates that there will not be any changes to the value expressed as the value expressed as the normal deviation of the error term. The name "heteroskedastic" implies "differing variety" since it is derived from the Greek terms "hetero," meaning "different," and "skedasis," meaning "dispersion." Error words that do not have a constant variance are the ones that this phrase is used to describe. Heteroskedasticity can happen, for example, in a model where the DV shows how much a family spends on vacations each year and the IV shows how much the family makes each year. Low-income families will spend very little on vacations, and there won't be much variance in their outlays among themselves. Yet, the quantity of discretionary money will be larger for families with high salaries. There will be more variability among these families, a larger mean amount spent on holidays, and heteroskedasticity as a consequence.

3.14.4 Granger Causality Test

A kind of mathematical assessment known as the Granger test of causality was created for the first time in 1969. By using this method, we are going to evaluate the claim that the two variables under consideration are related. This will be done in order to see whether one time series may help with the prediction of another time series. It is attempting to accomplish this goal. Regressions may often just show "mere" relationships, but Clive Granger suggested that economic causality might be assessed by determining how well a time sequence could be

anticipated based on its prior values. The premise of Granger's thesis was that economic causation could be measured in this manner. It was Clive Granger's answer to the question of how to tell whether a connection is real or not. This claim was made by Granger in response to the finding that regressions sometimes only reveal correlations. Granger's work was released in 1969. Granger, C. W. J. (1969). According to economists, the Granger test only uncovers "predictive causality," rather than "true causality," since it is erroneous to assume that simply because one item occurred before another, it follows that it was responsible for the latter occurrence. Instead, the concept of "post hoc ergo propter hoc" states that something occurring before another indicates that it caused the latter to occur. X In 2007, The Parent was published. The more accurate term for Granger-causality is "precedence," or, as Granger subsequently remarked in 1977, "temporally linked." However, it is conceivable that the usage of the word "causality" by itself might be misleading. The Granger test for causation examines whether X can accurately predict Y rather than whether X is the cause of Y. This is because Edward Granger invented the Granger causality test. This is because Edward Granger, who created the Granger causality test, was responsible for its creation. This is because Karl Granger was the one who came up with the concept of the Granger causality test. John D. (1994) It is said that one time series, denoted by "X," "granger-causes" another time series, denoted by "Y," if it can be shown that X contains statistically significant information on the future values of Y and if this can be confirmed. The word "granger causality," which describes the connection between two time series, is where the name "granger-cause" originates. This indicates that X foretells the value of Y in the future. A "granger-cause" relationship is the term used to describe this sort of relationship. Most of the time, this may be accomplished by doing several t-tests and F-tests on delayed X values. The phrase "granger-cause" derives from the French word "granger," which in German also includes lagged values of Y and means "to cause." Granger highlighted various studies' "ridiculous" findings that used "Granger causality" assessment outside of economics. William (1988). He said in his Nobel lecture, "Of course, many dumb publications arose." John Clive's function (2004) Despite this, a lot of scholars use this strategy since it is straightforward to use computationally when looking at the causes of time series. The initial description of causality by Granger does not take into consideration immediate or non-linear causal linkages, as well as hidden confounding effects, in spite of several efforts to resolve these difficulties. Even if there have been many changes, this is still the case.

3.14.5 Stability Test

The CUSUM and CUSUMSQ analyses for statistic constancy were originally used in mathematics and econometric investigations, respectively, by researchers Brown et al. in (1975). The tests are an improvement over those conducted by Chow (1960) since they do not require knowledge of where the predicted structural break could be located. An examination of recursive residuals at various scales is the backbone of these tests. Nevertheless, the primary goal of these assessments was not to create a formal assessment system but rather to serve as a diagnostic tool that would expose latent systemic faults. The CUSUM family of examinations is now extensively used for the formal assessment of parameter consistency, notwithstanding these initial intentions. As opposed to the sort of analytical tool that Brown and other scholars designed them to be, formal statistical tests for the dependability of parameter values have demonstrated that these approaches are beneficial, so there is no need to be hesitant about applying them. However, as there hasn't been much in-depth study on this topic, the question of whether they are able to dismiss an incorrect null hypothesis inevitably arises. Using Monte Carlo techniques, McCabe and Harrison (1980) assessed the relative merits of a number of tests for stationery and time-dependent variations in parameter values, along with studies for random walk parameters. They are less interested in which test yields the most accurate results and more interested in how well the recurrent residuals as well as the ordinary least squares (OLS) residuals function in relation to one another. Ploberger and Kramer (1990) found that the CUSUM test outperforms the CUSUMMSQ test when the goal is to identify only one change in the variable being tested in a model derived from linear regression. Even if the data for both tests is the same, this is the case. This is the situation where you wish to determine if any changes have occurred. Based on the results of their study, it is possible to deduce this. The comparison of the two tests leads to this conclusion. This is due to the larger sample size used in the CUSUM test. You can show that this is actually the case by comparing the two exams side by side. In this study, we demonstrate that the form of error process utilized in the regression model influences the CUSUMSQ test's maximum distribution. This shocking development caught everyone off guard. According to Deng and Perron (2008), a new version of the CUSUMSQ exam is superior to the previous edition since it corrects a flaw in the latter.

The researchers encountered this issue when investigating the relationship involving the test as well as the regression model, which they learned about throughout their analysis. This issue was resolved in an earlier test version, so there's nothing to worry about.

CHAPTER IV

4.0. Results And Interpretation

4.1. Introduction

There are four sections to this chapter. An overview of the study's results and a look at how experts in the field have evaluated the influence of the exchange rate on South Africa's economy are presented in the opening paragraphs of this article. The significance of these results will be discussed in the next portion of this article. Having previously studied the various data analysis strategies at length, this component of the research focuses on descriptive statistical methods. From there, we'll examine and evaluate the stationary test for gathering data before moving on to the next subject. And after that, we're going to continue on to another section where we'll discuss and examine co-integration. The word "co-integration" describes the connection among two separate variables that are unrelated to one another. This section will evaluate and deconstruct the inanimate test for collecting information in more depth. The discussion of statistical regression, testing for diagnostics, and data or the outcomes of stability tests will take up a large chunk of the final section these three subjects are connected in some way. The workout will be over after this last session is finished. Despite this setback, testing was conducted using the E-Views application, and the demonstration was completed in line with the study's objectives.

4.2. Descriptive Statistic

A summary statistic, also known as a descriptive statistic, is one that quantifies or summarizes certain aspects of a given body of data (in the sense of a count noun). According to Prem S. (1995), the procedure entails using and analyzing descriptive statistics (in the sense of a mass noun). Instead of using the data to draw conclusions about the community that the sample is meant to reflect, the goal of a descriptive figure is to provide a description of the sample itself. This allows for a clear distinction to be made between descriptive statistics and inferential statistics (or inductive statistics). As a consequence of this, it is possible to draw the conclusion that, in opposition to inferential statistical methods, which are based on probability theory, descriptive statistics are

frequently nonparametric statistics. Dougall, Y. (2003). Even when inferential statistics are used to obtain the most important conclusions from a data study, descriptive statistics are often still offered as an additional component of the investigation. A table that goes with a report on human subjects might have information like sample sizes, subgroup sample sizes (for example, for each treatment or exposure group), and demographic or clinical characteristics (for example, mean age, percentage of male and female subjects, and prevalence of co-morbidities). These are just a few examples of the types of information that might be included in such a table. Metrics such as central tendency measurements and metrics of variance or dispersion are often used when attempting to characterize a data collection. Outliers (kurtosis and skewness) and the tendency toward the middle (mean, median, and mode) are used to measure dispersion.

Table 2.1 Descriptive Statistic

Variables	GDP	INF	MC	REER	RIR
Mean	2.032751	9.910260	167.7008	109.6991	4.167039
Median	2.400000	8.137433	147.9882	104.4821	4.172434
Maximum	6.620583	23.04617	322.7110	181.3517	12.69103
Minimum	-6.342471	3.745754	62.44132	70.67473	-11.00901
Std.Dev.	2.589730	4.659764	67.25274	29.05957	4.003237
Skewness	-0.779823	0.768449	0.550442	0.779137	-0.956362
Kurtosis	4.037564	2.709337	2.542509	2.963940	6.883529
Jarque-Bera	5.994607	4.179509	2.427955	4.150425	32.01470
Probability	0.049922	0.123717	0.297014	0.125530	0.000000
Sum	83.34280	406.3207	6875.733	4497.663	170.8486
Sum Sq. Dev.	268.2680	868.5362	180917.2	33778.34	641.0363
Observation	41	41	41	41	41

Source: This study

The mean for GDP is 2.032, making it the lowest in this category, whereas the mean for REER is 109,699, making it the second highest. The median GDP score is 2.400, the median REER score is 104.482, the maximum GDP score is 6.620 and the minimum REER score is 70.674. The minimum GDP score is -6.342, and the maximum REER score is 181.351. Skewness is a metric for determining the amount of symmetry in a variable's distribution. If the responses for a particular variable tend to cluster in either the right or left extremities of the delivery, we say that the distribution is lopsided. A skewness with a positive value means that there are more small values than big ones, while a skewness with a negative value means that there are more big values than small ones. Most of the time, a skewness value between -1 and +1 is considered good, while a value between -2 and +2 is usually considered satisfactory. Readings that fall between -2 and +2 are considered indicators of substantial deviation from normal. Hair, amongst other things (2012) the kurtosis is a measurement that can be used to determine how peaky a distribution is. (A severely skewed distribution, with the majority of replies clustered in the middle). A positive value for the kurtosis means that the distribution has more peaks than usual. On the other hand, the presence of a negative kurtosis is indicated by a curve that is flatter than it would normally be. Along the same lines as skewness, the general guideline states that the distribution has an overwhelming amount of peaking if the kurtosis value is greater than 2. A kurtosis value of less than 2 is another indicator of an excessively uniform distribution. According to George and Mallery's research from 2019, a sequence of reactions is considered to have a normal distribution when both its skewness and its kurtosis are relatively small. (Hair et al., 2022).

4.3. Unit Root Tests

Tests for unit roots may be performed on time sequence variables to ascertain whether or not they vary over time and whether or not they have a unit root. In academia, his concept of the null hypothesis is "there is a unit root." Alternate hypotheses, on the other hand, may have a uniform, exponential, or trend-stable distribution, all of which rely on the test findings. It is automatic to generate the null hypothesis, often known as the assumption of no effect. Both the improved Dickey-

Fuller test and the serial correlation method may be used. Since the ADF unit root test covers more problems, it needs to replace the DF test. To eliminate any lingering autocorrelation, a second postponed phrase is provided for the dependent variable. Data from this study was put through the Schwartz Data Parameter to get the answer to the bonus question. (SIC). Despite the fact that the AIC is the most common and often used, the SIC is the most sought-after because of the stringent and demanding traits it possesses. To determine whether or not a particular variable has a unit root, Perron created the Phillips-Perron (1988) test, which Neath and Cavanaugh (2007) used. The null hypothesis's confirmation and the possibility that a motionless system produced the parameter are potential outcomes. According to the default null hypothesis, the relevant parameter has a unit root. However, Dfuller's extended Dickey-Fuller test employs additional delays for the first-differenced parameter, while Perrion uses the Newey-West (1987) average error to account for serial correlation. Dfuller is responsible for these two tests.

Table 3.1 The Unit Root Tests

	ADF unit root test			*PP unit root test*		
Variables	*Level*	*1st difference*	*Order*	*Level*	*1st difference*	*Order*
GDP	*0.9805*	*0.0000*	*İ (1)*	*0.4073*	*0.0000*	*I(1)*
INF	*0.4897*	*0.0053*	*I(1)*	*0.0004*	*-0-*	*I(0)*
MC	*0.9911*	*0.0150*	*I(1)*	*0.9989*	*0.0001*	*I(1)*
REER	*0.8920*	*0.0061*	*I(1)*	*0.1135*	*0.0001*	*I(1)*
RIR	*0.5306*	*0.0000*	*I(1)*	*0.0000*	*-0-*	*I(0)*

The outcomes of the tests performed on the unit roots for both the ADF and the PP unit roots are shown in Table 3.1. According to the findings, each variable used in the ADF unit root test is stationary at the first difference in the data set. Though only two of our variables (INF and RIR) are level-stationary in the PP unit root test, three of them (GDP, MC, and REER) are level-stationary in the PP first-difference test. To be sure, this is the situation. As a consequence, we decided that the ARDL model was the best option for the regression analysis that would follow this thesis.

4.4. ARDL Bound Test

Both Gujarati (2003) and Veerbik (2004) point out that there are different ways to use econometrics to get close to an equation. (1). In the event that all of the variables remain unchanged or if I make use of the method of conventional least squares, equation (1) can be easily approximated. (0). (OLS). However, on the other hand, prior to performing an ordinary least squares examination on the initial differences, the results have to be converted by dividing if any of the values are integrated in order 1 or I. In the event that one or more of the variables are integrated in order I, then the (1). Depending on whether or not the variables in equation 1 show cointegration, there are many different ways to deal with cointegration. Engel and Granger's (1987) two-step residual-based strategy and Johansen's (1991, 1995) maximum likelihood reduction rank algorithm are two methods that are often used for cointegration analysis. To make sure that all of the regressors are appropriate for these two techniques, some pre-testing is necessary (1). This is necessary because a combination of I (0) and I (1) explanatory variables leads to an incorrect statistical conclusion based on standard cointegration tests. For example, when stable series are added to the model, the trace and maximum eigenvalue checks of the Johansen method become less clear. This is because false regressions are more likely to happen with other system variables when I (0) variables are used in the analysis. Abbott and De Vita (2004) Thus, when working with a small sample size, none of these cointegration techniques can produce reliable findings. A research study by Narayan and Narayan was released in 2004. In comparison to older cointegration methods, this is a huge step forward. Another benefit of the ARDL limits testing approach is that it is more cost-effective than the maximum probability diminished rank testing method. The approaches developed by Johansen (1991, 1995) and Engel and Granger (1987) have the advantage of functioning more effectively with smaller groups. In addition, the ARDL scenarios' OLS short-run estimated coefficients are consistent with [the square root of (T)], while the ARDL scenarios' long-run estimated coefficients are extremely congruent even with a small number of samples. This is the case even though the sample sizes are very small. Pesaran & Shin, (1999).

Table 4.1 ARDL bound test

Model			Lag.		F-Statistics	Decision	
GDP, INF, MC, REER, RIR			(3,4,4,0,4)		5.842020***	Co-Integration Exist	
Bond Critical Value							
					I (0)	I (1)	
Sign.			10%		2.2	3.09	
			5%		2.56	3.49	
			2.5%		2.88	3.87	
			1%		3.29	4.37	

Source: this study

The findings demonstrate that the value of the F-statistic generated by the ARDL model is greater than the critical values established by Pesaran et al. (2001) and Kripfganz and Schneider (2001) when the threshold of significance is set to 1%. at both the lower and upper limits, I (0) and I (1). This is true whether the lower bound or the upper bound is looked at first. The absolute value of the t-statistic is higher than the critical values (5.84) of the lower and upper ranges given by the writers who came before me. This is true because the t-statistic has a bigger absolute number. This is true, no matter how important something is. The aforementioned information suggests that the null hypothesis is false and that the variables in question are not independent of one another as the null hypothesis claims. Instead, the variables are co-integrated with one another. There are relationships, both short-term and long-term, between the fluctuating exchange rate and the other aspects that are seen as a direct and immediate outcome of this. The ARDL model is used to demonstrate how these linkages evolve through time, both in the short and long terms.

4.5. ARDL Long Run

Table 5.1 ARDL long run test

Variables	Coef.	Std.Error	t.statistic	Prob.
INF(-1)	-0.628	0.306	-2.0446	0.056
MC	0.000	0.000	0.021	0.983
REER	0.056	0.055	1.017	0.323
RIR	0.185	0.193	0.961	0.349

Source: this study

Table 5.1 of the ARDL long-run test indicates that inflation has a detrimental impact on South Africa's economic development. Niyimbanira (2013) looked at the relationship between inflation and economic growth in South Africa from 1980 to 2010, and he came to the same conclusion, which fits with this finding. With the help of the Augmented Dickey-Fuller method, we check for the series' unit root, and with the help of the Johansen-Juselius co-integration method, we see if inflation and economic development are linked in a way that is cointegrated. Each of these steps starts with the idea that the series must start with a single unit. Granger causality was applied at two different delay times to see if one of these two things caused the other. This action was taken after it was shown that the two factors are linked over an extended time frame. The findings showed that for both lags 2 and 4, unit-directional causation is clearly flowing from inflation to economic growth. This is the case regardless of the lag. Also, the results support Odhiambo's assertion that the stock market contributes to South Africa's economic development. This study measures economic development through the lens of real gross domestic product (GDP) per individual. (2010), and it is compared to three measures of stock market performance. These metrics are capitalization, exchange value, and circulation. This study made use of data sets that covered the period from 1971 to 2007, and its empirical results suggest that the measure that was used to analyze stock market growth is directly related to whether or not there is a direct correlation between growing stock markets and expanding economies. When we examine fluctuations in market value as an indicator for changes in the stock market, we discover that economic growth and changes in the stock market are positively connected with one another. This is because changes in market value are directly tied to changes in the stock market. When both the value exchanged and the movement of the stock market are taken into account, it would seem that the growth of the stock market is a driver of economic expansion. This is the case whether or not the value traded is taken into consideration. Base on the results of the research, a higher rate of economic growth is connected to a rise in the value of equity investments. This association was shown to hold true throughout a range of economic growth rates. The outcomes are consistent regardless of the timeframe used to demonstrate causation. In addition, there is evidence suggesting a link between a stronger rand and a growing economy in South Africa. The same

conclusion was reached by Patel and Mah (2018) after they examined the connection between the real exchange rate and economic development in South Africa. This is an example of a backwards relationship. On the other hand, a favorable and substantial correlation can be found among the real exchange rate and both the amount of money in circulation and the amount of direct investment from abroad. In the short term, only exports were substantial and positively correlated with the actual exchange rate. Granger causality results revealed that the sole factor that affects the actual exchange rate is export granger. This research also demonstrates that there is a causal flow in one direction only from investment to economic progress, as well as a causal flow in one direction only from investment to the establishment of finance. In South Africa, the direction of the relationship between financial depth and economic growth is mostly set by demand, even though changes in interest rates are good for the country's overall financial depth. Given the correlation that exists between investment and financial development, as well as the prima facie apparent causality that exists between investment and growth, it would seem probable that the expansion of South Africa's real sector, rather than the country's financial sector, is what is primarily responsible for the country's prosperous economy.

4.6 ARDL Short Run

Table 6.1 ARDL short run

Variables	Coef.	Std.Error	t.statistic	Prob.
D(INF)	-0.045	0.204	-0.609	0.5505
D(MC(-1))	0.045	0.0090	5.0306	0.0001
D(RIR)	0.1856	0.1352	1.3724	0.1877
REER	0.056	0.055	1.017	0.323
coinEq(-1)	-0.878	0.1304	-6.7350	0.000

Source: this study

The ARDL short-run test's Table 6.1 shows that inflation has a negative impact on South Africa's economic growth. This result fits with what Mandeya Sin and YuHo found in their study of how inflation and worries about inflation affect development in South Africa. They used autoregressive distributed lag (ARDL) approximation techniques to

look at quarterly data from 1961 to 2019. The methods were used on information spanning from 1961 to the present day. Prior to and following the implementation of inflation targeting in South Africa, we were the first scholars to examine how inflation and inflation fear impacted the country's economic growth. This distinguishes our investigation from previous work on the nation. It was determined to use the vector auto-regression (VAR) method, with a focus placed on the variance breakdown of prediction errors as well as the impulse response component. The study's results suggest that currency exchange rates are far more consequential for economic growth than interest rates. Specifically, diction mistakes and the impulse response component were shown to be less affected by interest rates as the time horizon lengthened. The study's results suggest that currency exchange rates are far more consequentially favorable for economic growth than interest rates. In particular, a favorable influence of interest rates was discovered; however, its magnitude diminished with longer investment horizons. The discovery was fascinating. The effect of this factor on economic growth was less while restrictions were in place than after they were lifted, suggesting that the latter was more important for policy. The research concluded that a looser monetary policy in Nigeria was an important element in the country's economic growth. However, since it discourages new company investment, interest rate liberalization nearly never contributes to economic growth. As a result of this, the essay suggests that interest rate control, which was widespread between the years 1970 and 1980, should be reintroduced rather than interest rate liberalization and deregulation. This is because interest rate control helps ensure that rates remain stable.

4.7 Residual Diagnostic

We refer to the error term as being serially correlated because Williams (2015) claims that when error words from various points in time are connected, this is referred to as serial correlation. Time-series studies can sometimes find serial relationships when mistakes from one time period keep happening in the next ones. One of the several varieties of serial correlation is referred to as first-order serial correlation. There are many other types of serial correlation. In this particular fashion of sequential association, mistakes that occur in one time period have a strong connection to errors

that occur in the subsequent time period. It is possible that mistakes will be made even after they should not have been made; for instance, if data are taken every three months, then the error for one year in the fall would be connected to the fall error of the following year if the data are collected in the same manner. When there is a beneficial connection, the number of errors that occurred in one period is positively associated with the number of errors that occurred in the following period. According to Gujarati and Porter (2009), the Jarque-Bera test and the normalcy prospect plot are two other normality tests that have been written about in addition to the most popular histogram residuals. The Jarque-Bera exam was selected for this study's objectives since it is a formal examination2014; Brooks. Since the variance and the mean are the only parameters that properly define a normal distribution, the JB test may be used in this situation. 2009 Porter and Gujarati Porter and Gujarati the stochastic plot and the residuals of the histogram are two graphical tools that may be used to understand or assess the shape of the probability density function of a variable, but they are not relevant to this research. Williams (2015) discusses heteroskedasticity by highlighting the fact that OLS is predicated on the idea that V (j) = 2 for every j. This suggests that the variance of the error term is fixed. The Greek words "hetero," referring to "different," and "skedasis," which means "dispersion," are the origins of the English word "heteroskedastic," which means "different variation." Error words with variable variance are defined using it. Heteroskedasticity may appear, for example, in a model where the DV denotes a family's yearly vacation expenditure and the IV denotes the family's annual income. Low-income families will travel less often, and there won't be much variance in their individual spending patterns. However, families with high earnings will have more money available for discretion. These families will thus show more heteroskedasticity, greater mean vacation spending, and more variance.

Table 7.1 Residual Diagnostic

Tests	Statistic	P value	Results interpretation
Serial correlation	1.0971	0.0943	No serial correlation
Normality	1.8619	0.3941	Normal distribution
Heteroskedasticity	3.1930	0.9868	No Heteroskedasticity

Source: this study

The "null hypothesis" of serial correlation is the null assumption of serial correlation for delays of up to two times. In order to determine whether a serial correlation exists, we need to start here. This analysis is also known as a linear model (LM) test for serial correlation. This is because the Lagrange multiplier testing strategy is used in this evaluation. With these results, the nun hypothesis may be considered true, as the probability level is above the significance level of 0.05. This supports the null hypothesis that the sample follows a normal distribution. The non-normal distribution of the population, as implied by the null hypothesis, is at odds with this data. To conclude that the residuals do, in fact, follow a normal distribution, we need only note that the outcomes of the inquiry are consistent with the null hypothesis. The homoscedasticity hypothesis claims that the data satisfy this condition. However, according to the heteroscedastic hypothesis, these calculations are incorrect. A significant degree of heteroscedasticity may be inferred from the data if the p-value for a test of heteroscedasticity is less than a threshold value, such as 0.05. The p-value is far larger than the 0.05 threshold; hence, the absence of heteroscedasticity is accepted as the null hypothesis.

4.8 Granger Causality Tests

In 1969, a statistical hypothesis test known as the Granger causation test was developed with the goal of determining whether or not one time series may assist in the prediction of another. Mr. C. W. J. Granger (1969): whereas Clive Granger said that in economics, causality would be determined by establishing how well a time series may be predicted based on its past values. Clive Granger's statement may be found here. Granger theorized that the traditional meaning of regressions, which indicates "mere" links, would shift in the not-too-distant future. 1969 saw the first publication of Mr. Granger's findings. It is erroneous to conclude that the mere fact that one item happened before other shows it to be a cause of that occurrence, as argued by econometricians, who claim that the Granger test can only identify "predictive correlation" (post hoc ergo propter hoc). "X, Dad" (2007) Granger-causality is more accurately described as priority or, as Granger put it in 1977, "temporarily related," so it is misleading to use the word "causality" alone. E. Edward (1985) The Granger causality test, developed by Paul Newbold (1977), assesses whether X predicts Y rather than whether X causes YA time series X is said to "granger-cause" additional temporal data Y if it can be proved, usually by a series of t-tests and F-tests on delayed values of X, that it gives statistically

meaningful knowledge about future values of Y. (with lagged values of Y also included). Granger underlined the "ridiculous" conclusions of various research outside of economics that utilized "Granger causality" tests. Walter (1988) "Of course, many dumb publications occurred," he acknowledged in his Nobel acceptance speech despite this, it is still widely used for time series causality studies due to the ease with which it can be implemented computationally, according to John Clive (2004). Anil (2007) says that the traditional idea of Granger causality doesn't take into account direct and non-linear causal relationships, as well as any hidden effects that could mess things up. He also claims that this definition does not take into account any interference effects. This is despite the fact that various modifications have been made to resolve these difficulties.

Table 8:1 Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
INF does not Granger Cause GDP GDP does not Granger Cause INF	39	0.545 1.722	0.584 0.193
MC does not Granger Cause GDP GDP does not Granger Cause MC	39	0.618 0.823	0.544 0.447
REER does not Granger Cause GDP GDP does not Granger Cause REER	39	1.265 3.146	0.295 0.055*
RIR does not Granger Cause GDP GDP does not Granger Cause RIR	39	4.558 0.811	0.017* 0.452
MC does not Granger Cause INF INF does not Granger Cause MC	39	1.496 2.330	0.238 0.112
REER does not Granger Cause INF INF does not Granger Cause REER	39	8.106 6.445	0.001* 0.004*
RIR does not Granger Cause INF INF does not Granger Cause RIR	39	2.112 0.145	0.136 0.865
REER does not Granger Cause MC MC does not Granger Cause REER	39	3.619 2.800	0.037* 0.074
RIR does not Granger Cause MC MC does not Granger Cause RIR	39	0.089 0.106	0.914 0.899
RIR does not Granger Cause REER REER does not Granger Cause RIR	39	1.172 3.879	0.321 0.030*

The Granger causality test findings are shown in Table 8.1, and they point to a one-way link between the exchange rate and GDP expansion. For this reason, the test results favored the investigating path. Based on these findings, it's clear that the

exchange rate plays a more facilitating role than a driving one in economic expansion. This nuance is critical to note. Interest rates are a significant source of economic growth, but GDP is not a significant cause of interest rates, indicating a linear causal connection. This data points to the significance of the link between economic expansion and interest rates. This relationship is substantial. In addition, the exchange rate and inflation both have bidirectional causation, which means that the two variables reinforce each other. Since there is only a 5% connection between the two markets, this suggests that the key factor that influences the stock market is the rate at which currencies are exchanged. The value of one currency compared to another is not significantly impacted by movements in the stock market's performance. There is now an association between these two variables; however, it only functions in one direction, and that direction is upward. The upward direction is the only one in which it operates. It only exerts its influence in the direction of upward progress. Interest rates, on the other hand, do not have any direct impact whatsoever on the value of a currency; rather, the fundamental element that affects interest rates is the exchange rate.

4.9 Stability Tests

Figure 1.1 CUSUM Test
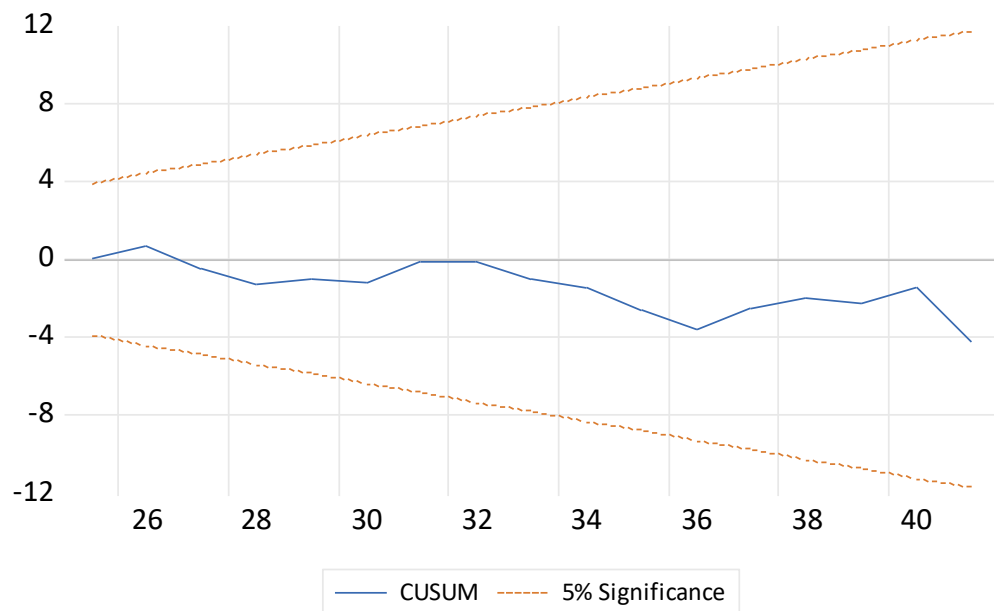
Figure 2.1 CUSUM of Square Test
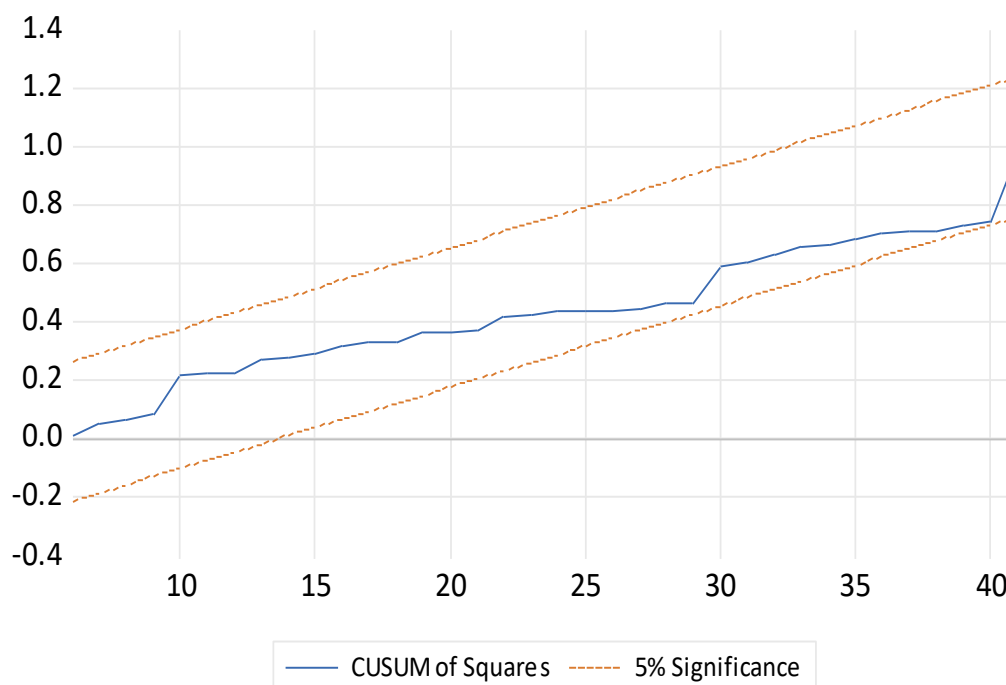
Figures 1.1 and 2.1, respectively, illustrate the outcomes of the stability evaluations that were conducted. According to the results, there was no alteration to the perimeter for both the (CUSUM) and the (CUSUMSQ). The cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests are used in this endeavor. The CUSUM test emphasizes the stability of the model's parameters over the long run, whereas the CUSUMSQ test emphasizes the stability of the model's parameters over the short run. The test is referred to as "CUSUM" in its abbreviated form. This study demonstrates a robust and consistent relationship between the variables of interest by demonstrating that the results of the CUSUM and CUSUMSQ tests developed by Brown, Durbin, and Evans (1975) must remain below a 5% threshold (shown by two straight lines).

CHAPTER V

5.0. Overview, Conclusion and Recommendations

5.1. Overview

The argument is centered on the fluctuation of exchange rates, about how successful various exchange rate regimes are. Changes in exchange rates have also made these worries worse since flexible exchange rate regimes were put in place in 1973. Omojimite and Akpokodje (2010), one of the most notable characteristics of fluctuating exchange rate systems is the ensuing exchange rate fluctuation, which can cause significant economic disruption. South Africa's economy is among those whose stability has been threatened by recent exchange rate fluctuations. The rand's instability in earlier years has been unusual among emerging market currencies. In spite of recent efforts to do so, South Africa has been unable to reduce the rand's volatility, which is due to factors including the global economy's inherent uncertainty and the outflow of capital from countries that have an abundance of it. Significant change has taken place in South Africa during the last decade. In the words of Pretorius and de Beer, "being concerned with the volatility of the rand" was the impetus behind the establishment of the Myburgh Commission in order to investigate the collapse of the rand. This commission was created to look into the collapse of the rand. 2002. The worth of the rand depreciates to a low of R13.002 on December 20, 2001, achieving the low value of R3.64 per US dollar on May 29, 2002. This decline in value occurred between January 1, 1996, and May 29, 2002. Concerns over the regulation of exchange rates have recently found their way to the forefront of the continuing conversation in South Africa regarding economic reform. This is an important step in the process. Mining has not only been the engine behind an otherwise varied economy, but it has also had an effect on macroeconomic policy, particularly policies regarding exchange rates Kahn, (1992). The word "exchange rate" is used to describe the ratio between the values of currencies in two different economic regions. For illustration's sake, we need to find out how many rand of the South African currency (ZAR) we would need to buy one dollar (USD). To express it this way, on January 1, 2009, one dollar in United States currency could be obtained for the equivalent of 6.79 rand in South African currency. A further component of foreign

exchange is made up of assets that are denominated in a different currency. It is feasible to use these overseas assets in the same manner as foreign currency, such as making international payments and Delays in payment for transactions involving other countries. Using foreign money to pay for overseas endeavors is one illustration of this. The overall demand for foreign currencies has grown over the last several years as a consequence of the growth of internationalization, which has sparked a rise in international commerce, and the implementation of a system for electronic payments. In addition to being one of the biggest financial markets in the world, the foreign exchange market is also one of the most lucrative for investment and commercial banks. The values of the different currencies transacted on the exchange rate market are determined by supply and demand, according to Stephen as well as his colleagues (1998). Chiira (2009) asserts that one major element influencing how profitable banks are is the volatility of currency rates. This is because the capacity of banks to participate in monetary intermediation is impacted by exchange rate fluctuations. The availability of the foreign exchange rate is a result of international commerce. This makes it more likely that national economies will grow and thrive. Academics have come to the opinion that significant fluctuations in the exchange rate harm a country's trade transactions and its balance of accounts as a result of extensive theoretical and empirical study on international trade. These are the findings that researchers who have extensively studied international commerce have reached. Many different research teams have conducted investigations along similar lines. This disparity may be seen in the varied ways that governments from across the globe have responded to the changing values of their national currencies throughout time. Since the middle of the 1990s, the South African Reserve Bank (SARB) has refrained from trading in the market for foreign exchange rates. This takes place in order to advance toward attaining the goals of the government's Growth, Jobs, and Redistribution (GEAR) plan. The real exchange rate is a crucial purchasing indicator since it tells us about long-term growth in all regions equally. Numerous studies have shown that the number of commodities exported and the overall amount of money that individuals bring in have a significant impact on how stable or unstable the real exchange rate is. (In reference to a real exchange rate equilibrium level, The South African Rand has been very volatile ever since the Reserve

Bank of South Africa (SARB) implemented the current flexible exchange rate regime in 1997 and Bah and Amusa (2003). However, the implementation of a trade strategy that is focused on international markets has increased the likelihood that increasing exports will be a key driver of the economy's continued expansion. Because global currencies are allowed to float freely, the Rand has become increasingly unstable. Therefore, it is crucial to look at how changes in the Rand affect exports and, therefore, the economy of a nation. South Africa has to quickly raise its export rate of products. The debate centers on whether or not the Rand's depreciation has increased South African exports' competitiveness in foreign markets or whether or not the Rand's volatility has made it difficult to determine whether or not a firm is profitable export output has suffered as a result. The topic of how a country's exchange rate influences economic growth is crucial, both from a normative and a statutory vantage point. In the regression analysis of this research, the secondary test used is: The bulk of research projects rely on merging two forms of information, and theoretical comprehension and data assessment are two common strategies for obtaining such results. The methodology followed in this investigation was identical to that of the previous one. Obtaining quantifiable data on a wide variety of features and traits is essential, and the World Bank Data Center serves as a prime example. Their website has this information. The effort will gather data annually for four decades, beginning in 1980 and extending through 2020.

The study will continue to gather information every year for the next 41 years. The findings would be more credible and accurate if they were based on a thorough examination of economic indicators over a long period of time, including real effective exchange rates, inflation, stock market growth, and economic expansion. This thesis employs a unit root test based on the AR and PP procedures. The ADF unit root test is preferable to the DF test since it addresses more problems. It includes an additional lag term for the dependent variable to remove autocorrelation in the residuals. The Schwartz Information Criterion is used in this research to identify that additional work (SIC). The SIC is more desirable due to its strictness and stringent characteristics, despite the AIC being the most common and most utilized neath & Cavanaugh, (1997). To ascertain whether or not a particular variable has a unit root, Perron employs the Phillips-Perron (1988) measure. One way to test the alternative to the null hypothesis, which holds that

the number was generated by a static process, is to examine the data to see whether it has a unit root. In most cases, one will expect there to be a unit root for the relevant quantity ("null hypothesis"). To adjust for serial association, Perrion employs the standard errors from Newey-West (1987). While D fuller uses an extended Dickey-Fuller test with extra delays for the first-differenced variable. Both methods may be found in the referenced articles. For this particular investigation, we made use of the ARDL binding assay. (1969) John C. Granger Despite Clive Granger's suggestion that the idea of causation in the realm of economics may be examined by looking at how effectively time series data could be predicted based on its past values, regressions typically only show "mere" connections. A time series might be used to evaluate this data. Since it is mistaken to assume that the mere fact that one item happened before another indicates that it was a consequence of that development (post hoc ergo propter hoc), econometricians claim that the Granger test can only identify "predictive causality," as compared to "true causality." They claim that the Granger test only detects predictive causality. The effects of this activity are as follows: The results of the analyses performed on both the ADF and PP's unit roots are shown in the table that follows (Table 3.1). The findings demonstrate that every one of the variables in the ADF unit root test have been found to be stationary as opposed to the initial difference. Every single one of the abovementioned attributes fits this description. Our GDP, MC, and REER parameters are constant at the first difference, according to the findings of the PP unit root test. Despite the fact that two of our variables—INF and RIR—are level-stationary, this is the case. This is true even if two of our variables are stationary, and our calculations on the unit roots of the ADF as well as the PP are shown in the following table (Table 3.1). Each of the variables was found to be stationary with respect to the baseline difference, as determined by the ADF unit root test. This definition encompasses all of the following qualities: Our GDP, MC, and REER variables are all stationary at the initial difference, as shown by the PP unit root test. Despite the fact that INF and RIR, two of our variables, are level-stationary, this is the case. Even if two of our variables are fixed, this still remains the case. As a result, we decided that while doing the regression analysis for this thesis, it would be appropriate to employ the ARDL model. The F-statistic generated by ARDL was found to be statistically

significant at the 1% level of confidence. It was thus bigger than the critical values calculated at the 0 and 1 limits by Pesaran et al. (2001) and Kripfganz and Schneider (I (0) and I), respectively. It was discovered that these values were true at zero limits. The significance level for the F-statistic that was utilized to draw this conclusion was set at 1% (2020). The absolute value of the t-statistic was found to be larger than the critical values that had been provided (5.84), for both the lower and upper bounds that had been suggested by the previous authors, at every level of relevance that was taken into account. The facts that have already been examined show that the variables are co-integrating, disproving the null hypothesis. One may thus argue that over time, the factors that were taken into account, including the currency rate, are interconnected. This conclusion is reinforced by the findings of Niyimbanira's (2013) study, which examines the relationships between inflation and economic growth in South Africa from 1980 to 2010. Niyimbanira's research covers the years 1980 through 2010. The Johansen-Juselius co-integration method is what's employed when putting the idea of a co-integrated relationship between rising prices and expanding economies to the test. This conclusion is in line with what Patel and Mah (2018) discovered when they investigated the connection among South Africa's real exchange rate and the general pace at which the country's economy expanded throughout the course of their study. The research, which used time series data, looked in depth at the years 1980 through 2015. The years 1980 through 2015 were covered in depth by the research, which utilized time series data. According to the findings of the research, alterations in interest rates have contributed positively to the expansion of South Africa's economy, and this outcome can be understood through the application of cointegration and error-correction models. The research finds that the development in financial markets caused by changes in interest rates does not inevitably lead to increased investment and economic growth, which runs counter to the findings of several other studies. The research also finds that investment leads to expansion and that there is a one-way connection between investment and monetary progress. While the study finds that rising interest rates are good for South Africa's financial health, it also finds that the correlation between financial health and economic development often lags behind demand. Table 5.1 of the ARDL short-run test demonstrates that inflation has a detrimental impact on South Africa's economic

expansion. This result is in line with what Mandeya Sin and YuHo found in their study on the effects of inflation and changes in inflation on growth in South Africa, which looked at quarterly data from 1961 to 2019. On this set of data, they employed strategies for prediction known as autoregressive distributed lag (ARDL). Unlike previous research on the country, we were the first to look at the effects of inflation and price fears on development in South Africa both before and after inflation targeting was put in place. Since then, we've been able to examine whether or not the factors' behavior has changed and, thus, evaluate inflation targeting's efficacy. Long-term and short-term effects of inflation on development are both negative, while inflation fear is a short-term occurrence with negligible significance over the long run in South Africa. Maintaining price equilibrium is an important goal for lawmakers to work toward if they want to foster development.

Between 1961 and 2019, the research looked at how inflation and inflation uncertainty affected South Africa's economic growth. According to the article, inflation in South Africa hinders economic development both immediately and over the long term, but inflation concern is simply a short-term problem Thus, it only has an instant impact on economic development. It is interesting to note that after inflation targeting was implemented, South Africa's economic growth was no longer reliant on a volatile inflation environment. Furthermore, the results support Odhiambo's theory that growth in the stock market is associated with economic development in South Africa. (2010) As a measure of economic growth, gross domestic product per person is used as a yardstick to evaluate the stock market's expansion in this study. In order to do research regarding the stock market's growth, this comparison has to be made. 2010 was the starting point for the inquiry process that would take place following that year. The results of the qualitative analysis employed in this research, which is founded on data sets from 1971 to 2007, suggest that the relationship between the growth of the market for shares and the growth of the economy may vary depending on the indicator used to measure it. These conclusions are based on data sets that range from 1971 to 2007. These conclusions were reached during an examination that was conducted between 1971 and 2007. Market capitalization serves as a proxy for stock market expansion, which demonstrates that economic expansion is the main factor propelling stock markets

upward. Considering the value of the market is a clear indicator of stock market growth, using it as a gauge of stock growth in the market illustrates that this is what happens. But it appears that a vibrant stock market does, in fact, support the growth of the economy when both the volume of business and the value of operations are taken into consideration. In summary, the results suggest that there may be a link between an improvement in the economic environment and an increase in stock prices. The results may be explained either from a short-term or a long-term perspective on causation. Interest and exchange rate fluctuations have also contributed to South Africa's economic growth. Research on interest rates, currency exchange rates, and economic development in Nigeria between 1970 and 2010 finds these findings to be entirely consistent with expectations. The study period essentially corresponds to the two separate economic eras of the age of control and the period of deregulation. The major focuses of the study, which utilized the method known as vector auto-regression (VAR) methodology, were the forecasting error variance split and the reaction time component. The findings demonstrated that exchange rates influenced economic growth more than interest rates. In particular, it was demonstrated that although interest rates had a favorable effect, it diminished as the time perspective ended up being longer. It had a regulatory impact since it was in force at a time when lower effect on economic expansion than when it was in effect during a period of deregulatory. The study's results show that letting the exchange rates be more flexible was good for the Nigerian economy because it helped to speed up economic growth. On the contrary, the liberalization of lending rates has a small influence on the growth of GDP since it diminishes the opportunity to create new businesses. As a consequence of this, the research suggests that interest rate liberalization and deregulation should be avoided in favor of interest rate limits that are identical to the ones that were in effect throughout the 1970s and 1980s.

For each order with up to two delays, there is no real serial correlation, contradicting the conventional view, often known as the null assumption of serial correlation. The default viewpoint is this one. It is possible to hear it referred to as an LM test for a serial correlation, although it also goes by various names modeled after the Lagrange multiplier test, which serves as its theoretical foundation. This is because it depends on the examination indicated before. It is acceptable to assume that the nun

assumption is true in regard to the facts supplied here given that this specific P value is larger than 0.05. We are able to arrive at the notion that the residuals also follow a typical flow since the results of this study support the null hypothesis. The null hypothesis states that the data are homoscedastic. On the other hand, the alternative explanation indicates that the data are heteroscedastic. Therefore, if the p-value for an experiment for heteroscedasticity is less than an upper limit that has been defined, such as 0.05, it is conceivable for us to conclude that the data are very heteroscedastic. The findings demonstrate that the p-value is much greater than the threshold of 0.05%. This indicates that the null hypothesis is compatible with the absence of heteroscedasticity since it is also in line with the absence of heteroscedasticity. In Table 8.1 above, the results of the Granger causality test are shown. These results suggest that changes in exchange rates actually encourage increases in economic activity. This implies that economic growth affects the exchange rate but does not by itself result in an exchange rate that is greater. At the 5% level of relevance, it has been empirically shown that interest rates affect growth in the economy but not the reverse way around (interest rates create GDP but not GDP). This link is significant. Additionally, the position is improved by both the exchange rate and the inflation rate. These two elements work together to achieve the intended result. The phrase "bilateral transmission" has been used to describe this occurrence. Stock market value and currency exchange rates are tied for a number of reasons, not the least of which being the 5% correlation between the two. This indicates that, although the equity market may have an influence on the currency rate, the effect does not work in the other way. Right now, the interest rate can only have a negative effect on the value of the present currency exchange rate. The rate of interest is not in any way impacted by the exchange rate, despite the fact that it tracks it. Figures 1.1 and 2.1 show how the stability experiment results turned out. The findings indicate that the boundary has not changed. The CUSUM and CUSUMSQ probes check in on the parameters' long- and short-term steadiness. A number of statistical methods, including the Chi-Square test, the cumulative sum (CUSUM), and the cumulative sum of squares (CUSUMSQ), were utilized to analyze the data for this research. Brown, Durbin, and Evans (1975) created the CUSUM and CUSUMSQ tests, and they demonstrate that there is a significant and consistent relationship between the components being studied when

the significance level is 5% or below. However, this is only true if the significance level is 5% or below. This is proven by drawing two parallel lines.

5.2. Conclusion

The correlation between the value of a currency's exchange rate and economic expansion between 1980 and 2020 is examined in this thesis. One of the countries where stability has been threatened by recent exchange rate movements is South Africa. The rand has recently seen unusually high volatility among currencies from developing nations. Considering the fluctuation of the currency is a function of both the uncertainty of the world's economy and the influx of cash from affluent countries, previous South African initiatives to stabilize its currency have been ineffective. When an important barrier is set at 1%, this is the situation. (2020). The absolute value of the t-statistic was found to be larger than the crucial threshold that had been provided (5.84), for both the lower and higher limits that had been suggested by the previous authors, at every level of importance that was taken into account. The above-mentioned findings disprove the notion that nothing is connected to the null hypothesis since they demonstrate that there is a relationship between the variables. As a result, it is possible to assert that there are connections between the value of exchange for currency and the other factors that should have been taken into account on both a short-term and long-term basis. These relationships might be favorable or unfavorable. The relationships between these components may be accurately depicted by utilizing ARDL models that account for both the short-run and long-run impacts. To get a sense of what the outcomes may be if you conducted the ARDL test over a longer period of time, have a look at Table 5.1. These results allow us to draw the inference that inflation has a role in the slowing of South Africa's GDP rate of growth. South Africa's inflation and economic growth between 1980 and 2010 were also studied by Niyimbanira (2013), who came to the same results. Johansen-Juselius co-integration testing is used to determine whether there is a co-integrated link between GDP growth and inflation. To further ensure that there is no unit root in the data, we use the Augmented Dickey-Fuller technique. Since there is mounting evidence that these two variables are irrevocably linked, a Granger causality study was conducted at two- and four-time delays to get a deeper understanding of their

connection. In this study, economic development is represented by the real GDP per person, while stock market growth is quantified by an analysis of the market, the value of its exchange, and the volume of its trading. The primary concept is an expedited financial plan. It's a tool for gauging how a shift in interest rates may affect the economy. In the next phase of the model, a discontinuous variable known as investment is added to the original bivariate situation. The objective is to better comprehend how the nature of the connection between the expanding banking sector and the maturing populations of countries has changed over time. The goal of this effort is to get a more sophisticated understanding of the connection's adaptability. This puts the framework in a good position to study the evolving connection between the financial sector's contribution to economic growth and development. The model's flexibility in accommodating both of these factors made this outcome possible. The result is a straightforward model of causation with three variables. The research provides strong evidence for the potential advantages that interest rate adjustments may have on South Africa's financial development by using cointegration and error-correction models. This study's findings go against a large body of prior research. The results of this research show that an increase or decrease in rates of interest is not necessarily accompanied by an equal increase or decrease in expenditure or economic development in the form of cash advancement. The results also support the unidirectionality and causation of this link between investment and growth. However, the data also shows that while higher rates of interest are desirable, the relationship between financial stability and economic development often lags behind demand good for South Africa's financial health, they are advantageous to the nation's economy as well. Table 6.1 shows the results of the ARDL short-run test, which show that inflation dampens economic development in South Africa. Our findings are consistent with those of Mandeya Sin and YuHo (2021), who analyzed the impact of inflation and inflation concern on economic growth in South Africa using quarterly data from 1961 to 2019. They approximated using an ARDL (autoregressive distributed lag) model. Mandeya Sin and Yu Ho conducted their research over a long period of time. While prior research focused on South Africa before or after inflation targeting was implemented, we were the first to analyze the impact of inflation and price concerns on growth in the country at both times. We may now assess

the effectiveness of inflation targeting by looking at whether or not the variables' behavior has altered since then. The consequences of inflation on prices are detrimental to development both in the short and long terms, but inflation anxiety is a short-term event in South Africa with little long-term importance. If politicians wish to promote growth, preserving the equilibrium of prices is an essential objective to aim toward. The effects of inflation and inflation volatility on economic growth in South Africa were analyzed in this research covering the years 1961 to 2019. The article claims that although inflation in South Africa slows economic development both now and, in the future, it is just a short-term issue since it only has an immediate influence on economic growth. It is interesting to note that after inflation targeting was implemented, South Africa's economic growth was no longer reliant on a volatile inflation environment. These findings also provide credence to Odhiambo's argument that the South African stock market is linked to economic growth. (2010) looks at the correlation between GDP per capita, market capitalization, and turnover as indicators of stock market growth. Depending on how the stock market growth indicator is calculated, the link between economic growth and a rising stock market may be weakened, according to the research's observational results, which are based on data sets covering 1971 and 2007. When market value is utilized as a surrogate for stock market growth, it is evident that economic expansion is the primary driver of stock market expansion. When both value and volume are taken into account, however, rising stock prices do seem to encourage economic expansion. The study's findings, taken as a whole, indicate that thriving financial markets contribute to a flourishing economy. No matter how far into the future we look for explanations, the results will be the same. South Africa's economic expansion is helped by growing interest rates and the value of the currency. The findings are in line with those of earlier analyses of the connection between interest rates, currency exchange rates, and economic growth in Nigeria between 1970 and 2010. The study period essentially corresponds to the two separate economic eras of the age of restriction and the age of deregulation. The research employed the vector auto-regression (VAR) approach and focused on the prediction error variance decomposition and the reaction time component. The results showed that alterations in exchange rates for currencies had greater predictive power for economic growth than variations in

interest rates. It was shown, in particular, that the rate of interest had a positive impact, although one that faded over long-time horizons. In the age of control, as opposed to the era of liberalization, the impact on economic progress was less. The study's findings demonstrate how exchange rate deregulation helped the Nigerian economy by promoting economic growth. The risk is not worth it since interest rate deregulation reduces investment, even if it has a small impact on GDP growth. In order to avoid interest rate liberalization and deregulation, the study recommends an end to interest rate control, as it did in the 1970s and 1980s. Table 8.1 contains the findings of a Granger causality test for your convenience. The table below provides further information about the examination's results. These data allow for a conclusion to be drawn about the impact that the currency exchange rate has on the expansion of the economy, but this is not the only way that this influence might appear. As can be seen from the facts shown here, economic growth must have some impact on the currency exchange rate; nonetheless, economic expansion does not result in a higher exchange rate. At the 5% level of relevance, it has been statistically shown that interest rates affect the growth of the economy but not the other way around (interest rates cause GDP but not GDP). It is crucial to keep this connection going. Furthermore, there is a connection between inflation and currency exchange rates, which strengthens each of these components separately (i.e., bilateral causation). Here is a possibility that the equity market as well as the exchange rate have a linear relationship if we suppose that there is a 5% correlation between them. These two items would have a linear connection if one existed. If so, it would seem that, rather than the other way around, stock market movements are caused by fluctuations in the rate of exchange. Despite the fact that the interest rate has never directly affected the exchange rate and will likely never do so in the future, it remains behind the latter. An essential measure of comparable pricing that demonstrates how industries have evolved through time is the actual exchange rate. It aids as a significant barometer of a country's global competitiveness. The actual value of the currency is revealed when we contrast the costs of domestically and externally produced commodities. In other words, this is the true value of the currency transaction.

5.3. Recommendations

Because exchange rates are the primary means by which foreign cash is transferred from those who deposit it to those who borrow it, they are a crucial component of the global economy. Given the significant of the exchange rate's involvement in the economies of each and every location on the globe Samea et al., (2014), it is imperative that you keep this at the rear of your mind. Depending on the economic factors that influence it and the extent to which they do so, a fluctuating rate of exchange could result in a beneficial or detrimental effect. These outcomes do not conflict with one another. The South African government must take a number of steps to guarantee that the country will maintain political stability, that adequate infrastructure will be built, and that a sound macroeconomic plan will maintain the stability of rates of interest and foreign currencies. Without the South African government acting, these three objectives cannot be met. The findings of this research suggest that certain actions must be performed to put the essential safeguards in place to maintain a steady inflation rate. There is a project that has to be completed in all cases. South Africa's GDP has been on the rise recently, which may indicate that foreign investors are growing more optimistic about the country's economic strength and capacity to weather the current global economic crisis. which is affecting economies all over the world. One of the implications that can be derived from the study's results is that a high rate of interest has some kind of relationship with the extension of the economy. Therefore, the central bank of South Africa must decide on an interest rate that will promote foreign investment. It has been shown that making business operations simpler helps the economy expand and thrive. The government is urged to maintain this approach as a result. By fostering an environment where companies feel safe and comfortable carrying out their regular operations, economic growth may be promoted. In certain circumstances, an increase in the value of the exchange rate for one currency might cause an otherwise booming economy to slow down. Given this, it is essential that policymakers take every possible measure to maintain currency values at reasonable levels that won't impede economic growth. It shouldn't be possible for nations like South Africa, which is now a developing nation, to receive aid from other nations. You may convert your foreign cash to rand at the South African Central Bank or at any commercial bank in the country.

References

Acar, M. (2000). Devaluation in developing countries: expansionary or contractionary?. Journal of Economic & Social Research, 2(1).

Aggarwal, R. (2003). Exchange rates and stock prices: A study of the US capital markets under floating exchange rates.

AMIRDHAVASANI, S., SELVAM, M., & KATHIRAVAN, C. (2019) Relationship between Real Exchange Rate and Economic Growth in Asia–Pacific Countries.

Antonopoulos, R. (1997). An alternative theory of real exchange rate determination for the Greek economy. New School University.

Anyanwu, F. A., Ananwude, A. C., & Okoye, N. T. (2017). Exchange rate policy and Nigeria's economic growth: A granger causality impact assessment. International Journal of Applied Economics, Finance and Accounting, 1(1), 1-13.

Auer, R. A., & Schoenle, R. S. (2016). Market structure and exchange rate pass-through. Journal of International Economics, 98, 60-77.

Bah, I., & Amusa, H. A. (2003). Real exchange rate volatility and foreign trade: Evidence from South Africa's exports to the United States. African Finance Journal, 5(2), 1-20.

Basher, S. A., Haug, A. A., & Sadorsky, P. (2016). The impact of oil shocks on exchange rates: A Markov-switching approach. Energy Economics, 54, 11-23.

Bank, S. A. R. (2002). South African Reserve Bank Quarterly Bulletin.

Caballero, Ricardo J., and Vittorio Corbo. 1986. "Exports and Stability." World Bank, Washington, D.C. Processed. Available upon written request from the authors.

Cassel, G. (1918). Abnormal Deviation in International Exchanges. Economic journal, N 28.

Chiira, Z. K. (2009). A survey of foreign exchange risk management practices by oil companies in Kenya.

Chiadikobi, O. J., Jide, O., & Dean, U. C. (2019) Impact of Exchange Rate Volatility on Economic Growth: Evidence from Nigeria.

Cilliers, J., & Aucoin, C. (2016). Economics, governance and instability in South Africa. Institute for Security Studies Papers, 2016(293), 1-24.

Deng, A., & Perron, P. (2008). A non-local perspective on the power properties of the CUSUM and CUSUM of squares tests for structural change. Journal of Econometrics, 142(1), 212-240.

De Gregorio, J. (1993). Inflation, taxation, and long-run growth. Journal of monetary economics, 31(3), 271-298.

Diamandis, P. F., & Drakos, A. A. (2011). Financial liberalization, exchange rates and stock prices: Exogenous shocks in four Latin America countries. Journal of Policy Modeling, 33(3), 381-394.

Dixit, A. (1989). Entry and exit decisions under uncertainty. Journal of political Economy, 97(3), 620-638.

Dornbusch, R., & Fischer, S. (1980). Exchange rates and the current account. The American economic review, 70(5), 960-971.

Dornbusch, R. (1991). Exchange rates and inflation. Mit Press.

Douglas, T. J., & Ryman, J. A. (2003). Understanding competitive advantage in the general hospital industry: Evaluating strategic competencies. Strategic management journal, 24(4), 333-347.

De Vita, G., & Abbott, A. (2004). The impact of exchange rate volatility on UK exports to EU countries. Scottish Journal of Political Economy, 51(1), 62-81.

Edwards, S. (1994). Chilean Trade and Exchange Rate Policy. The Chilean Economy: Policy Lessons and Challenges, Washington, DC: The Brookings Institution.

Engle, R. F., & Granger, C. W. (1987). Co-integration and error correction: representation, estimation, and testing. Econometrica: journal of the Econometric Society, 251-276.

Enyaah, R. C. (2011). An analysis of the effects of interest rate and exchange rate changes on stock market returns: Empirical evidence of Ghana Stock Exchange. Unpublished Masters Thesis. Kwame Nkrumah University of Science and Technology: Accra.

Fischer, S. (1979). Capital accumulation on the transition path in a monetary optimizing model. Econometrica: Journal of the Econometric Society, 1433-1439.

Franck, P., & Young, A. (1972). Stock price reaction of multinational firms to exchange realignments. Financial Management, 66-73.

Froot, K. A., & Rogoff, K. (1995). Perspectives on PPP and long-run real exchange rates. Handbook of international economics, 3, 1647-1688.

Gadanecz, B., Miyajima, K., & Shu, C. (2018). Emerging market local currency sovereign bond yields: The role of exchange rate risk. International Review of Economics & Finance, 57, 371-401.

Gautam, S., Chadha, V., & Malik, R. K. (2020). Inter-linkages between real exchange rate and capital flows in BRICS economies. Transnational Corporations Review, 12(3), 219-236.

George, D., & Mallery, P. (2021). IBM SPSS statistics 27 step by step: A simple guide and reference. Routledge.

GODFREY N. 2016. Why is competition important for growth and poverty reduction? [Internet:http://www.oecd.org/investment/globalforum/40315399.pdf; downloaded on 01 July 2017.

Granger, C. W., & Newbold, P. (1977). Identification of two-way causal systems. Frontiers of quantitative economics, 3, 337-359.

Granger, C. W., Huangb, B. N., & Yang, C. W. (2000). A bivariate causality between stock prices and exchange rates: evidence from recent Asianflu☆. The Quarterly Review of Economics and Finance, 40(3), 337-354.

Granger, C. W., & Lee, T. H. (1989). Investigation of production, sales and inventory relationships using multicointegration and non-symmetric error correction models. Journal of applied econometrics, 4(S1), S145-S159.

Gujarati, D., & Porter, D. (2003). Multicollinearity: What happens if the regressors are correlated. Basic econometrics, 363.

Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). A primer on partial least squares structural equation modeling (PLS-SEM). Sage publications.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. Journal of the Academy of Marketing Science, 40(3), 414–433.

Haliru, B. (2021). Impact of Inflation on Nigeria Economic Growth (1973-2019). Available at SSRN 4124745.

Henry, E., Murtadho, A. M., & Bhaumik, A. (2020). The Relationship Between the Exchange Rate Fluctuations and Economic Growth in Nigeria. International Journal of Management and Human Science (IJMHS), 4(4), 11-18.

Ho, S. Y. (2019). Macroeconomic determinants of stock market development in South Africa. International Journal of Emerging Markets, 14(2), 322-342.

Hoang, T., Thi, V., & Minh, H. (2020). The impact of exchange rate on inflation and economic growth in Vietnam. Management Science Letters, 10(5), 1051-1060.

Iscan, E. (2015). The relationship between commodity prices and stock prices: Evidence from Turkey. International Journal of Economics and Finance Studies, 7(2), 17-26.

Jain, A., & Biswal, P. C. (2016). Dynamic linkages among oil price, gold price, exchange rate, and stock market in India. Resources Policy, 49, 179-185.

Jalil, A., & Mahmud, S. F. (2009). Environment Kuznets curve for CO2 emissions: a cointegration analysis for China. Energy policy, 37(12), 5167-5172.

Jasova, M., Moessner, R., & Takáts, E. (2016). Exchange rate pass-through: What has changed since the crisis?.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. Econometrica: journal of the Econometric Society, 1551-1580.

Johansen, S. (1995). Likelihood-based inference in cointegrated vector autoregressive models. OUP Oxford.

Kang, J. W., & Dagli, S. (2018). International trade and exchange rates. Journal of Applied Economics, 21(1), 84-105.

Kallianiotis, J. (2013). Exchange Rates and International Financial Economics: History, Theories, and Practices. Springer.

Karahan, Ö. (2020). Influence of exchange rate on the economic growth in the Turkish economy. Financial Assets and Investing, 11(1), 21-34.

Karki, S., Bajara, S., & Dumre, A. (2020). A review on impact of inflation on economic growth in Nepal. Archives of Agriculture and Environmental Science, 5(4), 576-582.

Kisten, T. (2020). Macroeconomic implications of uncertainty in South Africa. South African Journal of Economic and Management Sciences, 23(1), 1-15.

Khan, M. F. H. (2021). Impact of exchange rate on economic growth of Bangladesh. European Journal of Business and Management Research, 6(3), 173-175.

Khomo, M. M. (2018). Essays on exchange rate behaviour in South Africa (Doctoral dissertation, Stellenbosch: Stellenbosch University).Kripfganz, S., & Schneider, D. C. (2020). Response surface regressions for critical value bounds and approximate p-values in equilibrium correction models 1. Oxford Bulletin of Economics and Statistics, 82(6), 1456-1481.

Kutty, G. (2010). The relationship between exchange rates and stock prices: the case of Mexico. North American Journal of Finance and Banking Research, 4(4), 1.

Madurapperuma, W. (2016). Impact of inflation on economic growth in Sri Lanka. Journal of World Economic Research, 5(1), 1-7.

Mahmudu M.A. & Gazi, S.U. (2009) Relationship between interest rate and stock price: empirical evidence from developed and developing countries. International Journal of Business and Management (ISSN 1833-3850), 4(3), 43-51.

McCabe, B. P. M., & Harrison, M. J. (1980). Testing the constancy of regression relationships over time using least squares residuals. Journal of the Royal Statistical Society Series C: Applied Statistics, 29(2), 142-148.

Mishra, A. K., Swain, N., & Malhotra, D. K. (2007). Volatility Spillover between Stock and Foreign Exchange Markets: Indian Evidence. International journal of business, 12(3).

Miyajima, K. (2020). Exchange rate volatility and pass-through to inflation in South Africa. African Development Review, 32(3), 404-418.

Mlambo, C., Maredza, A., & Sibanda, K. (2013). Effects of exchange rate volatility on the stock market: A case study of South Africa. Mediterranean Journal of Social Sciences, 4(14), 561.

Mohr, J. H. M. (2012). Utility of Piotroski F-score for predicting growth-stock returns. MFIE Capital, 30.

Morina, F., Hysa, E., Ergün, U., Panait, M., & Voica, M. C. (2020). The effect of exchange rate volatility on economic growth: Case of the CEE countries. Journal of Risk and Financial Management, 13(8), 177.

Mumtaz, H., & Theodoridis, K. (2015). The international transmission of volatility shocks: An empirical analysis. Journal of the European Economic Association, 13(3), 512-533.

Muzekenyi, M. M., Zuwarimwe, J. Z., Kilonzo, B. M., & Nheta, D. S. (2019). An assessment of the role of real exchange rate on economic growth in South Africa. Journal of Contemporary Management, 16(1), 140-159.

Neath, A. A., & Cavanaugh, J. E. (1997). Regression and time series model selection using variants of the Schwarz information criterion. Communications in Statistics-Theory and Methods, 26(3), 559-580.

Ncanywa, T., & Ralarala, O. (2019). Effects of exchange rate movements on stock market prices in South Africa. International Conference on Public Administration and Development Alternative (IPADA).

Ndou, E. (2021). Exchange rate changes, price level and the income effects on trade balance in South Africa. SN Business & Economics, 1, 1-19.

Ndou, E. (2022). Exchange rate changes on export volumes in South Africa under the inflation targeting period. SN Business & Economics, 2(6), 59.

Newey, W., & West, K. (2014). A simple, positive semi-definite, heteroscedasticity and autocorrelation consistent covariance matrix. Applied Econometrics, 33(1), 125-132.

Nieh, C. C., & Lee, C. F. (2001). Dynamic relationship between stock prices and exchange rates for G-7 countries. The Quarterly Review of Economics and Finance, 41(4), 477-490.

Niyimbanira, F. (2013). An investigation of the relationship between oil prices and inflation in South Africa. Mediterranean Journal of Social Sciences, 4(6), 105.

Omojimite, B. U., & Akpokodje, G. (2010). A comparative analysis of the effect of exchange rate volatility on exports in the CFA and non-CFA countries of Africa. Journal of Social Sciences, 24(1), 23-31.

Onwubuariri, S. E., Oladeji, S. I., & Bank-Ola, R. F. (2021). Inflation and economic growth in Nigeria: an ARDL bound testing approach. Sapientia foundation journal of education, sciences and gender studies, 3(1).

Osakwe, C. I., & Ananwude, A. (2017). Stock market development and economic growth: A comparative evidence from two emerging economies in Africa–Nigeria and South Africa. Archives of current research international, 11(1), 1-15.

Odhiambo, N. M. (2010). Interest rate reforms, financial deepening and economic growth in Tanzania: A dynamic linkage. Journal of Economic Policy Reform, 13(2), 201-212.

Ouattara, B. (2004). Modelling the long run determinants of private investment in Senegal (No. 04/05). Credit Research Paper.

Patel, D. (2018). An empirical analysis of real exchange rate and economic growth in South Africa (Doctoral dissertation, North-West University (South Africa).

Patel, D., & Mah, G. (2018). Relationship between real exchange rate and economic growth: the case of South Africa. Journal of Economics and Behavioral Studies, 10(1 (J)), 146-158.

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. Biometrika, 75(2), 335-346.

Phylaktis, K., & Ravazzolo, F. (2005). Stock prices and exchange rate dynamics. Journal of international Money and Finance, 24(7), 1031-1053.

Pesaran, M. H., Shin, Y., & Smith, R. P. (1999). Pooled mean group estimation of dynamic heterogeneous panels. Journal of the American statistical Association, 94(446), 621-634.

Pesaran, M. H., & Smith, R. P. (1998). Structural analysis of cointegrating VARs. Journal of economic surveys, 12(5), 471-505.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. Journal of applied econometrics, 16(3), 289-326.

Ploberger, W., & Krämer, W. (1990). The local power of the CUSUM and CUSUM of squares tests. Econometric Theory, 6(3), 335-347.

Polak, J. J. (1995). Fifty years of exchange rate research and policy at the International Monetary Fund. Staff Papers, 42(4), 734-761.

Porter, D. C., & Gujarati, D. N. (2009). Basic econometrics. New York: McGraw-Hill Irwin.

Pramanik, S. (2021). Exchange rate and Economic Growth-a comparative analysis of the possible relationship between them.

Prem, S. (1995). Success of Entrepreneurship Development Programmes: An Evaluative Study. SEDME (Small Enterprises Development, Management & Extension Journal), 22(2), 1-9.

Prem, S. (1995). Success of Entrepreneurship Development Programmes: An Evaluative Study. SEDME (Small Enterprises Development, Management & Extension Journal), 22(2), 1-9.

Razmi, S. F., Bajgiran, B. R., Behname, M., Salari, T. E., & Razmi, S. M. J. (2020). The relationship of renewable energy consumption to stock market development and economic growth in Iran. Renewable Energy, 145, 2019-2024.

Ramey, G., & Ramey, V. A. (1994). Cross-country evidence on the link between volatility and growth.

Robe, M. A., & Pallage, S. (2003). On the Welfare Cost of Economic Fluctuations in Developing Countries. Available at SSRN 319908.

Ruiz-Napoles, P. (1996). Alternative theories of real exchange rate determination. A case study: The Mexican peso and the United States dollar. New School for Social Research.

Sahay, M. R., Cihak, M., N'Diaye, M. P., Barajas, M. A., Mitra, M. S., Kyobe, M. A., ... & Yousefi, M. R. (2015). Financial inclusion: can it meet multiple macroeconomic goals?. International Monetary Fund.

Serven, L., & Solimano, A. (1991). An empirical macroeconomic model for policy design: the case of Chile (No. 709). The World Bank.

Semose, P. D., & Ogujiuba, K. K. (2021). Is there a nexus between inflation, exchange rate and unemployment in South Africa: an econometric analysis?. Montenegrin Journal of Economics.

Solnik, B. (1987). Using financial prices to test exchange rate models: A note. The journal of Finance, 42(1), 141-149.

Sanusi, K. A., & Kapingura, F. M. (2022). On the relationship between oil price, exchange rate and stock market performance in South Africa: Further evidence from time-varying and regime switching approaches. Cogent Economics & Finance, 10(1), 2106629.

Ncanywa, T., & Ralarala, O. (2019). Effects of exchange rate movements on stock market prices in South Africa. International Conference on Public Administration and Development Alternative (IPADA).

Takaendesa, P., Tsheole, T., & Aziakpono, M. (2006). Real exchange rate volatility and its effect on trade flows: New evidence from South Africa. Studies in Economics and Econometrics, 30(3), 79-97.

Takawira, O., & Motseta, S. D. (2021). The relationship between sovereign credit ratings and capital flows: A case of South Africa. International Journal of Economics and Finance Studies, 13(1), 251-276.

Tien, N. H. (2021). Relationship between inflation and economic growth in Vietnam. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(14), 5134-5139.

Thaddeus, K. J., Ngong, C. A., Nnecka, U. J., Nubong, N. M., Ibe, G. I., Chinyere C, O., & Onwumere, J. U. J. (2022). Stock market development and economic growth in sub-Saharan Africa (1990–2020): an ARDL approach. Journal of Economic and Administrative Sciences.

Tsai, I. C. (2012). The relationship between stock price index and exchange rate in Asian markets: A quantile regression approach. Journal of International Financial Markets, Institutions and Money, 22(3), 609-621.

Williams, M., Schwarz, P. A., Law, B. E., Irvine, J., & Kurpius, M. R. (2005). An improved analysis of forest carbon dynamics using data assimilation. Global change biology, 11(1), 89-105.

Wu, Y. (2000). Stock prices and exchange rates in VEC model—The case of Singapore in the 1990s. Journal of Economics and Finance, 24, 260-274.

Appendix

Appendix 1. Descriptive Statistics

	GDP	INF	MC	REER	RIR
Mean	2.032751	9.910260	167.7008	109.6991	4.167039
Median	2.400000	8.137433	147.9882	104.4821	4.172434
Maximum	6.620583	23.04617	322.7110	181.3517	12.69103
Minimum	-6.342471	3.745754	62.44132	70.67473	-11.00901
Std. Dev.	2.589730	4.659764	67.25274	29.05957	4.003237
Skewness	-0.779823	0.768449	0.550442	0.779137	-0.956362
Kurtosis	4.037564	2.709337	2.542509	2.963940	6.883529
Jarque-Bera	5.994607	4.179509	2.427955	4.150425	32.01470
Probability	0.049922	0.123717	0.297014	0.125530	0.000000
Sum	83.34280	406.3207	6875.733	4497.663	170.8486
Sum Sq. Dev.	268.2680	868.5362	180917.2	33778.34	641.0363
Observations	41	41	41	41	41

Appendix 2. ADF Unit Root Test

GDP

Null Hypothesis: GDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 13 (Automatic - based on t-statistic, lagpval=0.5, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.435904	0.9805
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

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

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on t-statistic, lagpval=0.1, maxlag=13)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.227440	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

INF

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 8 (Automatic - based on t-statistic, lagpval=0.5, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.562419	0.4897
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Null Hypothesis: D(INF) has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic - based on t-statistic, lagpval=0.1, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.884753	0.0053
Test critical values:	1% level	-3.632900	
	5% level	-2.948404	
	10% level	-2.612874	

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

MC

Null Hypothesis: MC has a unit root
Exogenous: Constant
Lag Length: 9 (Automatic - based on t-statistic, lagpval=0.1, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.739978	0.9911
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(MC) has a unit root
Exogenous: Constant
Lag Length: 8 (Automatic - based on t-statistic, lagpval=0.1, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.494010	0.0150
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

REER

Null Hypothesis: REER has a unit root
Exogenous: Constant
Lag Length: 9 (Automatic - based on t-statistic, lagpval=0.1, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.428612	0.8920
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(REER) has a unit root
Exogenous: Constant
Lag Length: 8 (Automatic - based on t-statistic, lagpval=0.1, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.861338	0.0061
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

RIR

Null Hypothesis: RIR has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic - based on t-statistic, lagpval=0.1, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.483079	0.5306
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(RIR) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on t-statistic, lagpval=0.1, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.851190	0.0000
Test critical values:	1% level	-3.626784	
	5% level	-2.945842	
	10% level	-2.611531	

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

Appendix 3. PP Unit Root Test

GDP

Null Hypothesis: GDP has a unit root
Exogenous: Constant
Lag length: 5 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.733226	0.4073
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant
Lag length: 4 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-9.514806	0.0000
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: 8 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.758390	0.0004
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

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

MC

Null Hypothesis: MC has a unit root
Exogenous: Constant
Lag length: 9 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		1.446802	0.9989
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: D(MC) has a unit root
Exogenous: Constant
Lag length: 8 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-111.2562	0.0001
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

REER

Null Hypothesis: REER has a unit root
Exogenous: Constant
Lag length: 9 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-2.541917	0.1135
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: 8 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-26.29280	0.0001
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

RIR

Null Hypothesis: RIR has a unit root
Exogenous: Constant
Lag length: 9 (Spectral OLS AR based on t-statistic, lagpval=0.5, maxlag=9)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-5.904315	0.0000
Test critical values:	1% level	-3.605593	
	5% level	-2.936942	
	10% level	-2.606857	

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

Appendix 4. ARDL Bound Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	5.842020	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Appendix 5. ARDL Long Run Result

ARDL Long Run Form and Bounds Test
Dependent Variable: D(GDP)
Selected Model: ARDL(3, 4, 4, 0, 4)
Case 2: Restricted Constant and No Trend
Date: 03/04/23   Time: 13:36
Sample: 1 41
Included observations: 37

| Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.004234	5.723307	1.223809	0.2377
GDP(-1)*	-0.878669	0.245188	-3.583648	0.0023
INF(-1)	-0.628011	0.306861	-2.046563	0.0565
MC(-1)	-0.035097	0.012325	-2.847597	0.0111
REER**	0.056448	0.055462	1.017778	0.3231
RIR(-1)	0.069454	0.169786	0.409066	0.6876
D(GDP(-1))	-0.339176	0.218514	-1.552193	0.1390
D(GDP(-2))	-0.300590	0.204431	-1.470378	0.1597
D(INF)	-0.105663	0.223930	-0.471856	0.6430
D(INF(-1))	-0.124776	0.420792	-0.296527	0.7704
D(INF(-2))	0.027566	0.312666	0.088164	0.9308
D(INF(-3))	-0.363436	0.197988	-1.835648	0.0840
D(MC)	0.000191	0.008909	0.021436	0.9831
D(MC(-1))	0.045402	0.011968	3.793485	0.0015
D(MC(-2))	0.046792	0.011078	4.224047	0.0006
D(MC(-3))	0.021965	0.010094	2.175969	0.0440
D(RIR)	0.185635	0.193093	0.961379	0.3498
D(RIR(-1))	-0.263890	0.196359	-1.343914	0.1966
D(RIR(-2))	-0.168540	0.173723	-0.970169	0.3456
D(RIR(-3))	-0.545902	0.159768	-3.416836	0.0033

Appendix 6. ARDL Short Run Result

ARDL Error Correction Regression
Dependent Variable: D(GDP)
Selected Model: ARDL(3, 4, 4, 0, 4)
Case 2: Restricted Constant and No Trend
Date: 03/04/23   Time: 13:38
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))	-0.339176	0.148616	-2.282226	0.0356
D(GDP(-2))	-0.300590	0.151528	-1.983725	0.0637
D(INF)	-0.105663	0.164819	-0.641086	0.5300
D(INF(-1))	-0.124776	0.204823	-0.609192	0.5505
D(INF(-2))	0.027566	0.202076	0.136413	0.8931
D(INF(-3))	-0.363436	0.148025	-2.455235	0.0251
D(MC)	0.000191	0.006588	0.028990	0.9772
D(MC(-1))	0.045402	0.009025	5.030658	0.0001
D(MC(-2))	0.046792	0.009213	5.078910	0.0001
D(MC(-3))	0.021965	0.008231	2.668602	0.0162
D(RIR)	0.185635	0.135254	1.372495	0.1877
D(RIR(-1))	-0.263890	0.133774	-1.972658	0.0650
D(RIR(-2))	-0.168540	0.140069	-1.203265	0.2454
D(RIR(-3))	-0.545902	0.133145	-4.100066	0.0007
CointEq(-1)*	-0.878669	0.130461	-6.735099	0.0000

Appendix 7. Residual Diagnostic

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	1.097102	Prob. F(2,15)	0.3592
Obs*R-squared	4.721681	Prob. Chi-Square(2)	0.0943
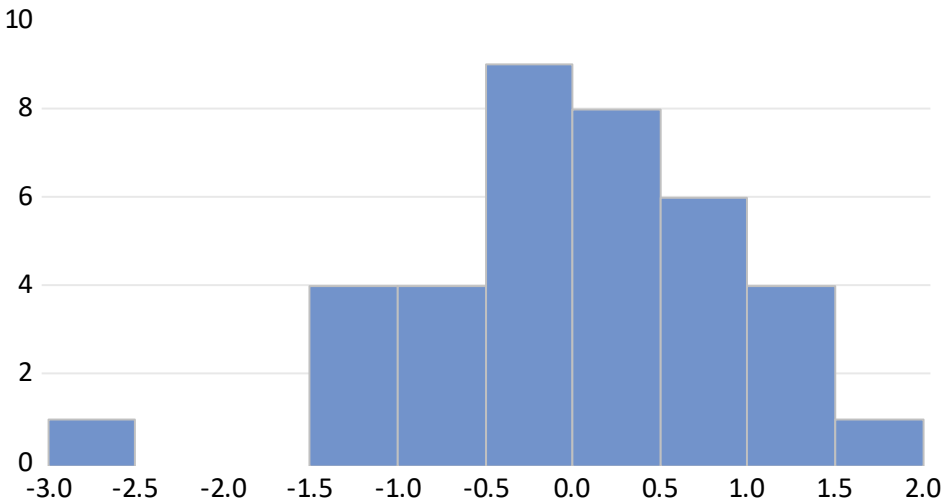
Series: Residuals	
Sample 5 41	
Observations 37	
Mean	-6.36e-16
Median	0.003851
Maximum	1.871616
Minimum	-2.667609
Std. Dev.	0.909944
Skewness	-0.454139
Kurtosis	3.618703
Jarque-Bera	1.861964
Probability	0.394166

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	3.193012	Prob. F(19,17)	0.0099
Obs*R-squared	28.90135	Prob. Chi-Square(19)	0.0676
Scaled explained SS	7.988562	Prob. Chi-Square(19)	0.9868

Appendix 8. Granger Causality Test

Pairwise Granger Causality Tests
Date: 03/04/23   Time: 13:45
Sample: 1 41
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
INF does not Granger Cause GDP	39	0.54595	0.5843
GDP does not Granger Cause INF		1.72201	0.1939
MC does not Granger Cause GDP	39	0.61857	0.5447
GDP does not Granger Cause MC		0.82307	0.4476
REER does not Granger Cause GDP	39	1.26544	0.2951
GDP does not Granger Cause REER		3.14663	0.0557
RIR does not Granger Cause GDP	39	4.55855	0.0176
GDP does not Granger Cause RIR		0.81121	0.4527
MC does not Granger Cause INF	39	1.49611	0.2384
INF does not Granger Cause MC		2.33033	0.1126
REER does not Granger Cause INF	39	8.10629	0.0013
INF does not Granger Cause REER		6.44567	0.0042
RIR does not Granger Cause INF	39	2.11282	0.1365
INF does not Granger Cause RIR		0.14501	0.8655
REER does not Granger Cause MC	39	3.61984	0.0376
MC does not Granger Cause REER		2.80068	0.0748
RIR does not Granger Cause MC	39	0.08947	0.9146
MC does not Granger Cause RIR		0.10659	0.8992
RIR does not Granger Cause REER	39	1.17267	0.3217
REER does not Granger Cause RIR		3.87985	0.0304

Appendix 9. Stability Test
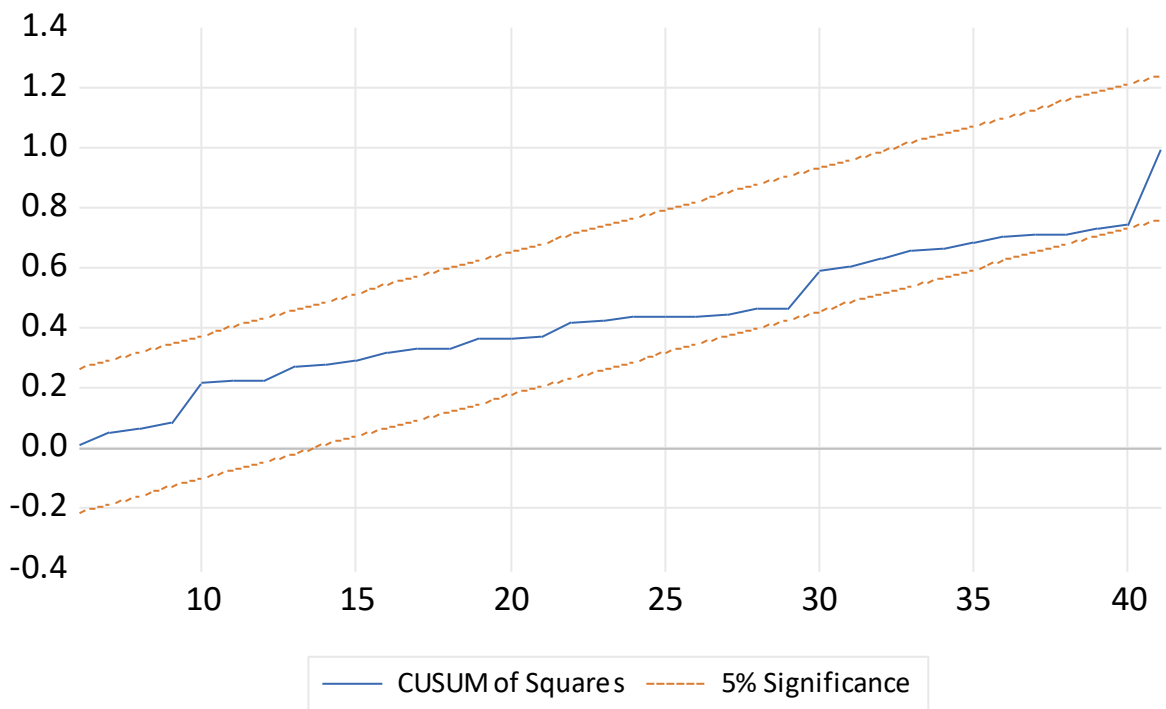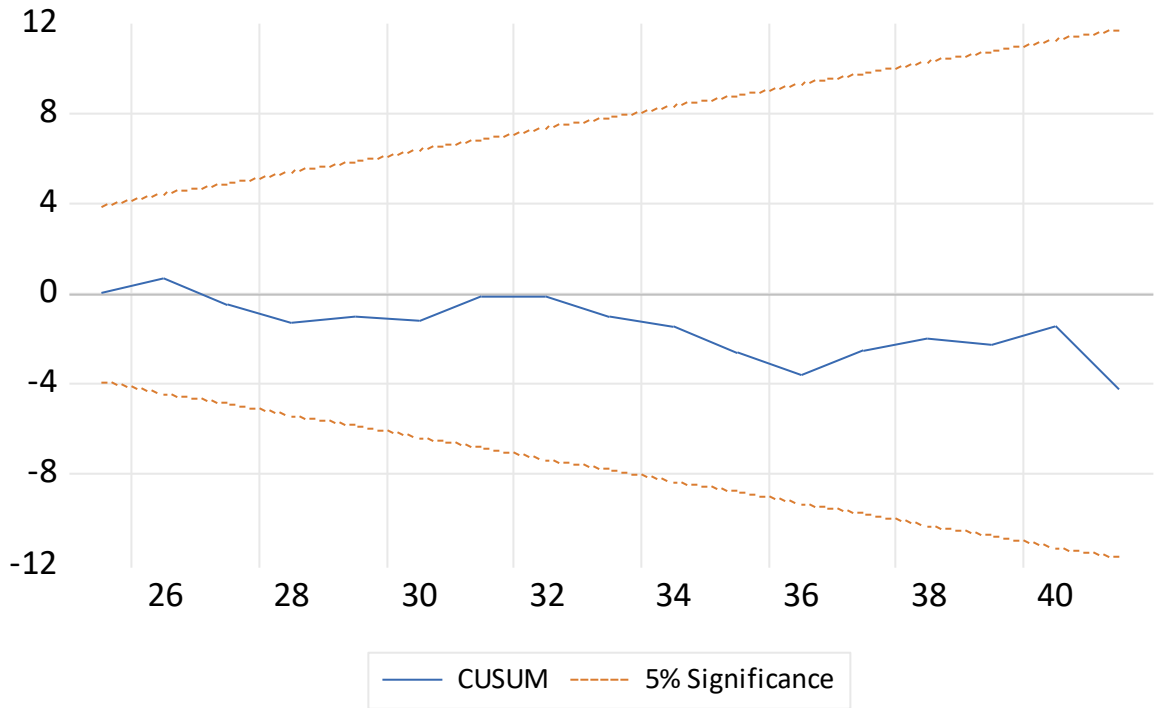
Ethical Certificate

NEAR EAST UNIVERSITY

SCIENTIFIC RESEARCH ETHICS COMMITTEE

05.06.2023

Dear Prof. Dr. Turgut Tursoy

Your project "**Analyzing Causality Between Exchange Rate and Economic Growth in South Africa (1980-2020)**" has been evaluated. Since only secondary data will be used the project does not need to go through the ethics committee. You can start your research on the condition that you will use only secondary data.

Prof. Dr. Aşkın KİRAZ

The Coordinator of the Scientific Research Ethics Committee

Turnitin Report

JOHN KOLLEH WEETOR-20215552- ANALYZING CAUSALITY BETWEEN EXCHANGE RATE AND ECONOMIC GROWTH IN SOUTH AFRICA (1980-2020)

ORIGINALITY REPORT

14% SIMILARITY INDEX	13% INTERNET SOURCES	7% PUBLICATIONS	3% STUDENT PAPERS

PRIMARY SOURCES

1	docs.neu.edu.tr Internet Source	4%
2	hdl.handle.net Internet Source	1%
3	researchspace.ukzn.ac.za Internet Source	<1%
4	vital.seals.ac.za:8080 Internet Source	<1%
5	www.researchgate.net Internet Source	<1%
6	core.ac.uk Internet Source	<1%
7	repository.nwu.ac.za Internet Source	<1%
8	link.springer.com Internet Source	<1%