JULIUS S. KEIFA

THE RELATIONSHIP BETWEEN EXCHANGE RATE AND FOREIGN DIRECT INVESTMENT: CASE STUDY NIGERIA (1981-20220)

Nicosia
JANUARY, 2023

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MSc. THESIS

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Approval

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Declaration

I hereby declare that all information, documents, analysis, and findings included in this thesis were obtained and presented in accordance with the academic regulations and ethical principles of the Near East University Institute of Graduate Studies. As required by these standards and regulation, I have credited and referenced all non-original sources and data used in this study.

JULIUS S. KEIFA

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Acknowledgements

To begin, I'd want to provide my energized management perspective. It would not have been able to finish this work without the genius and supervision of Dr. Mumtaz Ali, a professor in the Banking and Finance department at Near East University. Dr. Ali’s role as a supervisor had a major effect on the development of this work. I'd also want to take this opportunity to thank Dr. Turgut Tursoy, who serves as the head of the department in which I am now enrolled in classes. In the interest of showing my appreciation, I would like to thank Dr. Mehdi Seraj of the economics department for the support he provided with this research. I am grateful to him for his rapid responses to the daily emails that I sent him since they had a significant role in the development of the final product. He assisted me in gaining a better understanding of the econometric tools and the applications they had, beginning with the installation and continuing through their usage and analysis of the data. Because of them and because of Allah, I have been able to make it as far as I have in life.

In particular, I would want to express my gratitude to my brother Joseph Tokpah, whose aid has been of the utmost importance to me during my time spent in the Cyprus working toward the completion of my master's degree. In addition, I would want to take this opportunity to thank my older brother and good friend, Brother Paul S. Keifa, for the unending support he has provided for me throughout the course of my life. Much praise and gratitude are due to Tarr Bonokai Jackson for his infectious enthusiasm. Hannah Roberts, the lady of my dreams, deserves all the credit in the world for the progress we've made on this project thanks to her never-ending stream of positive reinforcement and unwavering mental and physical backing.

Abstract

THE RELATIONSHIP BETWEEN EXCHANGE RATE AND FOREIGN DIRECT INVESTMENT: CASE STUDY NIGERIA (1981-20220)

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This research investigates the relationship between exchange rate and foreign direct investment of Nigeria between the periods 1981-2020. When a country's rate of savings is lower than its rate of investment, the country needs another source of capital to help it make up the difference. Short-term capital inflows, which are often made by portfolio investors, have the potential to threaten the financial stability of a nation in the case of a crisis involving liquidity. As a result, foreign direct investment is a more dependable and attractive way of correcting the shortage in domestic saving. The term "foreign direct investment" refers to any investment made by a foreign organization directly into a domestic business. Econometric tools ARDL and pairwise Granger Causality Test were used as a means examining the relationship between exchange rate and foreign direct investment in Nigeria. The study adopted secondary time series data obtained, from the World Bank and the Central Bank of Nigeria. Diagnostic test was conducted to ensure that the models are in line with basic econometric assumptions.

Unit Root Test, stationary test, Error Correction Model (ECM) were applied to avoid spurious result. The granger causality test was applied to examine the effect of the independent variable on the dependent variables. The findings revealed that foreign direct investment have a positive impact on exchange rate in the short run and a negative impact on exchanger rate in the long run meanwhile; inflation and interest rate have a positive impact on Nigeria exchange rate both in the long and short run. The study recommends that managers and policymakers may improve their knowledge of the long- and short-term fluctuations of exchange rates and FDI flow patterns as a result of these results. Managers and policymakers may make better judgments if they understand the dynamic link between exchange rates and FDI flows.

Keywords: exchange rate, inflation, interest rate, economy, interest rate, fluctuation

Özet

DÖVİZ KURU İLE DOĞRUDAN YABANCI YATIRIM ARASINDAKİ İLİŞKİ: NİJERYA VAKA ÇALIŞMASI (1981-20220)

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Bu araştırma, 1981-2020 yılları arasında Nijerya'nın döviz kuru ile doğrudan yabancı yatırım arasındaki ilişkiyi incelemektedir. Bir ülkenin tasarruf oranı, yatırım oranından düşük olduğunda, farkı yaratmasına yardımcı olacak başka bir sermaye kaynağına ihtiyaç duyar. Ayrıca, portföy yatırımcılarının sıklıkla yaptığı kısa vadeli sermaye girişleri, likidite içeren bir kriz durumunda bir ülkenin finansal istikrarını tehdit edebilir. Sonuç olarak, doğrudan yabancı yatırım, yurtiçi tasarruf eksikliklerini düzeltmenin daha güvenilir ve çekici bir yoludur. "Doğrudan yabancı yatırım" terimi, yabancı bir kuruluş tarafından doğrudan yerli bir işletmeye yapılan herhangi bir yatırımı ifade eder. Nijerya'da döviz kuru ile doğrudan yabancı yatırım arasındaki ilişkiyi incelemek için ekonometrik araçlar ARDL ve ikili Granger Nedensellik Testi kullanılmıştır. Çalışma, Dünya Bankası ve Nijerya Merkez Bankası'ndan alınan ikincil zaman serisi verilerini benimsemiştir. Modellerin temel ekonometrik varsayımlarla uyumlu olduğundan emin olmak için bir teşhis testi yapılmıştır. Sahte bir sonucu önlemek için Birim Kök Testi ve Hata Düzeltme Modeli (ECM) uygulanmıştır. Ayrıca bağımsız değişkenin bağımlı değişkenler üzerindeki etkisini incelemek için granger nedensellik testi uygulanmıştır. Bulgular, doğrudan yabancı yatırımın döviz kurunu kısa vadede olumlu, uzun vadede ise olumsuz etkilediğini ortaya koymuştur. Bu arada, enflasyon ve faiz oranı Nijerya'nın döviz kurunu uzun ve kısa vadede olumlu yönde etkiliyor. Çalışma, yöneticilerin ve politika yapıcıların, bu sonuçlardan kaynaklanan döviz kurlarının ve DYY akış modellerinin uzun ve kısa vadeli dalgalanmaları hakkındaki bilgilerini geliştirmelerini önermektedir. Yöneticiler ve politika yapıcılar, döviz kurları ile DYY akışları arasındaki dinamik bağlantıyı anlarlarsa daha iyi kararlar verebilirler.

Anahtar Kelimeler: döviz kuru, enflasyon, faiz oranı, ekonomi, faiz oranı, dalgalanma

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TRNC: Turkish Republic of North Cyprus

MNE: Ministry of National Education

CHAPTER I

Introduction

If a nation's rate of savings is lower than its rate of investment, then the country's budget cannot be balanced. In order for the budget to be balanced, the government must either hasten the speed at which its economy is developing or find some other source of revenue. If a nation is going through a liquidity crisis, it is possible that short-term capital inflows from sources such as portfolio investors might pose a risk to the nation's capacity to maintain its financial stability. It is possible to make up for the low level of domestic savings by enticing in foreign direct investment (FDI) from other countries, which is an option that is both more secure and more tempting. According to the definition provided in the article, a "foreign direct investment" is any investment that is made by an international business into a business that is located inside the United States. The fact that the FDI recipient has direct control over the FDI project is what differentiates foreign direct investment (FDI) from foreign direct investment (FII) and FII portfolio investment. For this reason, rising countries should make enticing foreign direct investment their top priority. It is a commonly held belief that foreign direct investment (FDI) is beneficial to economies because it makes it easier to implement innovative new technology, which in turn increases worker productivity and makes more tacit knowledge available. Besides contributing to a larger trade surplus and a rise in the number of available jobs, foreign direct investment (FDI) brings the host nation a number of other advantages. Several schools of thought have speculated on the aspects of a nation's economic environment that are most likely to entice foreign direct investment (FDI). The validity of these hypotheses has been investigated using a variety of approaches.

Foreign direct investment decisions can be impacted by a wide variety of factors, some of which include but are not limited to: currency exchange rates, local trade restrictions, transaction costs, financial stability, political risks, labor costs, market proximity, and factor endowments of host countries (FDI). The behavior of the exchange rate, both in terms of its level and its volatility, is one of the most significant elements that might effect foreign direct investment (FDI). The level of the exchange rate as well as its volatility have both been quite modest. When the value of a nation's currency decreases, the costs of manufacturing products and providing services in that country also decrease. This impact, which is referred to as the "relative wage channel," is what ultimately results in lower production costs. It is more probable that foreign

investors will put money into a nation whose currency has lost value because of this. "Merger and acquisition," "new facility construction," "reinvestment of profits earned from overseas operations and intra company loans," and "a lasting management interest (10 percent or more of voting stock") in an enterprise operating in an economy that is not that of the investor" are some examples of "foreign direct investment." Other examples include "reinvestment of profits earned from overseas operations and intra company loans." One definition of direct investment is "an continuing managerial stake in a firm functioning in an economy that is not that of the investor." Another definition of direct investment is "investment in a company that is managed directly by the investor." One possible reason is that there is a greater availability of assets that have been "manufactured" to investors that have foreign direct investment (FDI) in these countries. The World Investment Report was published by the United Nations in 2007, and it stated that the value of foreign direct investment (FDI) reached an astounding $916 billion in 2006. In 2013, more over half of these payments were distributed to businesses that have operations in poor countries.

According to research, the amount of foreign direct investment (FDI) that comes from countries that are considered to be developing has seen a significant rise over the last two decade (Kumar & Page, 1998; Aykut & Ratha, 2003; UNCTAD, 2004). There is a lot of published material on this subject (Kumar & Page, 1998; Aykut & Ratha, 2003; UNCTAD, 2004). It has been said that foreign investment in Nigeria dates back to the nation's colonial era, which was the time when the colonial rulers of the country attempted to profit themselves via the exploitation of the country's natural resources. Since Western countries made the first discovery and exploration of the oil resources in Nigeria, the country's economy has been very sensitive to shifts in the amount of money invested there by outside parties. Despite this, the colonial authorities of Nigeria initially only gave a pittance of money for the country's oil exploration. Due to the fact that foreign direct investment (FDI) is known to have a number of beneficial benefits on a nation's economy, the government of Nigeria has developed a variety of incentive programs and regulatory policies in an effort to entice a bigger amount of FDI into the country.

In a manner of speaking that is similar, Sim (1980) said that privatization in Nigeria was carried out in conjunction with many other efforts to lure FDI (FDI). The ownership of companies that were once totally or partly controlled by the government has been transferred to private investors and/or management in certain cases.

Businesses engaged in manufacturing and farming, in addition to those concerned in logistics, utilities, and the distribution of products and services, are all present here. Reference: (Benassy-Quere, et al, 2001). (Benassy-Quere, et al, 2001). Since the return of democratic rule in 1999, the government of Nigeria has undertaken a number of initiatives, each with the intention of luring multi-national firms to establish operations inside the borders of the nation. These steps are being done in an effort to attract businesses from other countries. It appears plausible that this is the reason why these limits have been put into place according to what he has informed us about it. There are several different avenues that may be pursued in order to clear the path for direct investment from overseas businesses. As part of these steps, the president will go on a press tour outside the country, and new investment rules will be enacted. These are just two examples of the many different things people may do to help enhance the health of an ecosystem.

Despite a reduction of 6% to 660 projects, foreign direct investment (FDI) into Africa reached $87 billion in 2014. This is despite the fact that the number of projects decreased. This is a 64 percent increase over the levels seen in 2013. The fossil fuel sector, which comprises industries such as coal, oil, and natural gas, received about three-eighths of all FDI investments. The manufacturing sector was responsible for more than a third (about 33%) of all foreign direct investment (FDI) announcements made in the region. In 2014, Africa received around 13% of total FDI and 5% of all FDI projects. The total amount of foreign direct investment (FDI) in 2014 was $87 billion, which was greater than it had ever been in any previous year. This came about as a direct consequence of the execution of a large number of high-profile projects. In 2014, there were 464 different enterprises that invested a total of 464 million dollars in the region. In 2014, the areas of manufacturing, business services, and sales, marketing, and support had the most results from foreign direct investment (FDI) in Africa. In 2014, there were just 464 new investments made in the region, which is a significant decrease compared to the previous years. The sum of 505 for the previous year was lower than the tally for these years, which were 501.

Currency volatility is one factor among several that have the potential to influence the amount of foreign direct investment (FDI) (FDI). As was determined in the debate that came before, the "exchange rate" refers to the rate at which the currency of one nation may be exchanged for the currency of another country. They came up with the hypothesis that the most essential factors that determined the value of a

currency were shifts in the demand for it and the supply of it. Changes in the value of a country's currency in comparison to those of other countries have a direct impact on a nation's ability to assess the benefits and drawbacks of importing and exporting various types of goods. You are able to aggregate everything, including production, consumption, commerce, reserves, and outflows. Not only may shifts in exchange rate impact the total amount of foreign direct investment, but they can also influence the distribution of that investment across nations. According to what was found in, "the exchange rate is the single most crucial variable in an open economy that has direct influence on FDI" (Khan et al., 2012). According to the findings of a study Bilawal, et al. (2014) professionals, financiers, and policymakers all keep a close eye on the value of a country's currency if they want to determine where the best place is to put their money. They believed that a more advantageous exchange rate would provide them with an advantage in the international commerce in which they routinely participated.

Consumers are able to spend less money on imported items when the value of one country's currency increases in comparison to the value of another country's currency. This results in an increase in demand for the nation's exports. When seen in this perspective, it has an impact on choices about FDI, which therefore has an effect on GDP. Investing in a foreign currency, such as the dollar, in the hopes of generating larger returns and eventually increasing the value of the dollar in relation to the investor's own country's currency is one way that investors may be able to take advantage of the volatility of exchange rates. Another method is to speculate on the direction that exchange rates will take in the future.

Statement of the Problem

It has been widely acknowledged for some time that foreign direct investment (FDI) is essential to the growth of a prosperous economy. The introduction of cutting-edge technology, the training of new employees, and the creation of brand-new markets have all been financed with the support of foreign direct investment (FDI), which has been a driving force behind economic progress, innovation, and change in many nations all over the globe. It is hoped that with the enactment of the new constitution and the beginning of devolved government, these regions will be opened up to more trade and that a conducive environment that is necessary to attract foreign investment will be established. The establishment of decentralized authorities is what

is required to make this a reality. Because most of the nation is still in its early phases of development and because many of these regions have significant unrealized potential for agricultural output, foreign direct investment is more important than ever before (FDI).

The flow of foreign direct investment (FDI) is influenced by a wide variety of factors, such as, but not limited to, location, infrastructure, government regulations on entering the market, political stability, currency exchange rates, and many more. Calculations of the economic effects may be carried out individually for each of these variables, provided that the values of all of the other variables are held constant. The next research will investigate how changes in exchange rates affect foreign direct investment in the agricultural sector. This study's primary objective is to provide new information to the current body of research on the topic of foreign direct investment (FDI) in the country by concentrating on topics that have not been adequately investigated in previous research.

Instead, the purpose of this study is to discover whether or not a connection exists between the value of a country's currency and its inflows of foreign direct investment (FDI), and if so, whether or not that correlation is strong, and whether or not it goes in the desired direction. This research will take a different approach than previous studies, which have focused on the factors that have an effect on foreign direct investment (FDI) in the country. That is the primary objective of this investigation.

Purpose of the Study

The primary purpose of this study is to investigate how Foreign Direct Investment (FDI) contributes to the expansion of GDP in Nigeria. Other objectives include (ii) gaining an understanding of how foreign direct investment (FDI) influences the value of the Nigerian naira, and (iii) gaining an understanding of how FDI influences inflation in Nigeria.

Research Question

In light of the history of the matter at hand and the characteristics of the circumstance, this investigation will concentrate on the following important questions. Is it a reasonable assumption to make that changes in the value of a country's currency will have a significant influence on the amount of foreign direct investment received by that country?

Is there a correlation between the inflow of foreign direct investment and the currency rate's volatility?

Is it feasible that the value of the Nigerian naira might have an impact on the total amount of foreign direct investment (FDI) that the economy of Nigeria has managed to attract?

Significance of the Study

The current body of research contains studies that cover a variety of aspects of foreign direct investment (FDI), including its impact on economic growth. This study has been expanded to incorporate the variables of Exchange Rate and Inflation as additional variables. As a consequence of this, the study will make a contribution to the expanding corpus of empirical research on FDI. It is hoped that the study would provide the government with valuable insights that will assist them in developing successful strategies to attract FDI.

Statement of the Hypothesis

The following are the two hypotheses that were investigated in this study:

H1 There is a correlation between foreign direct investment (FDI) and the exchange rate.

H2 There is a connection between foreign direct investment and the exchange rate.

H3 There is a positive correlation between the level of direct investment from outside and the level of currency exchange.

Limitations

This study is flawed owing to the fact that it depends on a time period that is either difficult to predict or, due to the length of the time period, may no longer be relevant, despite the size of the sample group. Both of these circumstances make it difficult to make accurate predictions. Considering that libraries, archives, and earlier research provide a good basis for contemporary scientific investigation. There is a dearth of substantial research on this topic across the remainder of sub-Saharan Africa, including in Nigeria, where it is most prevalent. This indicates that the existing body of research does not effectively address the subject of how the exchange rate impacts the economic growth of Nigeria in relation to FDI.

Studies that investigate how foreign direct investment (FDI) affects economic expansion are hard to come by, and the ones that do exist provide conflicting results. This is a significant limitation of the study since it suggests that the findings cannot be extrapolated to include the whole of the population in Nigeria. The following will outline the procedures that were followed in order to prepare and carry out the different aspects of this research. The first chapter serves as an introduction, and it does so by providing a concise survey of pertinent material from the past that served as the basis for this inquiry. There is an overview of the study, a query for further investigation, a chart illustrating the growth of Nigeria's GDP from 1981 to 2020, and another chart illustrating the findings of the study. A description of the hypothesis that will be explored in order to produce findings that are in line with the aims and objectives of the research may also be found in this chapter. In the next chapter, we will discuss the findings that we obtained.

In this part of the report, you will find an explanation of the relevance of the study, as well as its purpose, research questions, and constraints, as well as a breakdown of the overall structure and organizational framework of the investigation. In Chapter 2, we analyze the fluid sequence of the literature review, concentrating on previous research that investigated the influence of Nigeria's exchange rate and foreign direct investment (FDI) on the economy of the nation. In particular, we examine the findings that come from undertakings of this kind that include research. In this part, the primary emphasis will be on drawing connections between our results and relevant previous research and literature.

As for the third component, we examine the data to see whether foreign direct investment (FDI) is at anyway responsible for the expansion of Nigeria's GDP. This research includes the data, where they came from, and how long they were collected for, as well as how long they were gathered for. This section is beneficial since it covers the objective of the research or the definition of the model, in addition to the technique that was used to gather data and evaluate it (statistical and econometric methods). For the benefit of the reader, each and every one of them is discussed. In order to make conclusions and evaluate those findings, we will spend more time in the fourth chapter thinking about what those conclusions imply in light of the material that was provided in the third chapter. This will allow us to draw conclusions and investigate those conclusions.

In Chapter 5, we make some recommendations based on the findings of the previous chapters and draw some more definitive conclusions from the data. (Recommendations on policy, which may include but are not limited to) Those who are in positions of authority in Nigeria may find these helpful while making decisions. The references that were used over the course of this inquiry are going to be compiled at the end of this work, in the fifth and final chapter. The chapter's sources are going to be covered in the next section. A detailed list of the sources that were used may be found below the condensed biographies of the many individuals who contributed to this investigation in some capacity. The pertinent information may be found in this section.

Definition of Term

Exchange rate- is such an important macro variable that may have an effect on the economy as a whole, it has been the subject of a great deal of debate among many economic actors, including policymakers, academics, and other market participants. The subject of whether to have a fixed, pegged or floating exchange rate system was widely disputed throughout the 1970s, since then most currencies in Europe have been floating, until recently when the euro was introduced. The topic is still extremely significant as nations now again stand before the decision of which currency rate regime to adopt.

Foreign Direct Investment (FDI) is "a form of cross-border investment undertaken by a resident of one country (the direct investor) with the purpose of creating a permanent stake in a business (the direct investment enterprise) that is resident in an economy that is resident in a country that is different than that of the direct investor." "a sort of cross-border investment made by a resident of one economy (the direct durable interest represents at least 10% of the voting power of the foreign direct investment business") is how the term "foreign direct investment" (FDI) is defined in this definition (OECD, 2009:17).

Interest rate: Interest is the quantity of money that is owing at the end of each month, and it is computed as a percentage of the total amount that was initially deposited, loaned, or borrowed. There are two distinct categories of interest rates: those that change often and those that remain constant for the course of their existence (called the principal sum). To determine the amount of interest that has been accumulated on a loan or deposit, the principal amount, the interest rate, the number

of times interest is compounded, and the amount of time over which the money was borrowed or put are all factors that are added together. The amount of interest that must be paid on a loan or credit line is determined by utilizing a number of different criteria. The total cost of borrowing money is determined by a number of factors, some of which are the amount of money that is borrowed, the interest rate, the length of time that the credit line or loan has been open, the number of times that interest is compounded annually, and the total number of times that interest is compounded. The length of time that the credit line or loan has been open is one of the most important factors.

Price inflation: may be characterized as a gradual decrease in the disposable income of consumers, and therefore, their ability to make purchases. The pace of growth in the price of a hypothetical "basket of goods and services" over a specific time period may be able to represent the diminishing purchasing power of consumers during a certain time period.

CHAPTER II

Literature Review

Introduction

In this part, we will offer a quick summary of the current state of the art in the relevant literature, as well as define a few essential concepts. This entire thing is based on research that has already been done and is drawn from books and papers that have already been published. Moreover, the books and publications that were used to compile this study have previously been published. The term "foreign direct investment" refers to capital that is transferred from a parent company or multinational organization to a subsidiary located in a different country (FDI). The process of investing money from overseas in domestic companies, industries, and goods is referred to as "foreign direct investment" (FDI). Investing in foreign stock markets is not covered in this article. In contrast to equity investments, which are seen as "hot money" that may flee at the first sign of problems, foreign direct investment (FDI) is seen as more long-lasting and often helpful regardless of the outcome.

This is in contrast to the perception that equity investments will flee at the first sign of trouble. For this reason, many individuals hold the opinion that nations would benefit more from receiving FDI than than investing money in their own stock markets. In most people's minds, help from other countries is seen in the same way that direct foreign investment is viewed; that is, as something that developing nations just cannot progress without. Several studies have shown that foreign direct investment (FDI) may help to spur economic growth in the country in which it is invested. Some of the effects include the creation of new jobs, an increase in both production and development, increased prices, and an improvement in the general welfare of the inhabitants of the country that is playing host (Kok & Ersoy, 2009).

Theoretical literature

Purchasing Power Parity Theory

When compared to the official exchange rate, the PPP may be used to establish whether or not a currency has been overvalued or undervalued. As soon as this estimate is made, it may potentially be validated by another technique of determining the degree to which the system is out of equilibrium. The reason for this is because purchasing power parity, or PPP, is a measurement of value, while the official exchange rate is a measurement of the worth of the currency. As a result, the official

exchange rate is used to determine the value of the currency. The use of absolute PPP allowed (Houthakker, 1962) to arrive at the conclusion that the US currency was 20% overvalued in the year 1962. This estimate has been criticized by (Floyd, 1965) who contend that it is erroneously high and should not be used. In order to accomplish this, he develops a model in which the degree to which the depreciation or appreciation of a currency would restore exchange rate equilibrium is a function of a variety of characteristics and parameters. In this model, the degree to which a currency's depreciation or appreciation would restore exchange rate equilibrium can vary.

The degree to which a fall or rise in the value of a currency would be able to restore equilibrium in the model is the disequilibrium of the model. This model also includes a number that specifies how much a currency needs to grow or fall in order to attain monetary parity. This amount may either be positive or negative. He demonstrates this by picking numerous different value ranges for the criteria, and the results suggest that the dollar is overpriced by no more than around 7 percent. However, it ought to be obvious that nobody can make any type of judgment on anything. The following is an impressive piece of evidence that supports the PPP theory: Calculating a time series of the relative PPP and then comparing it to a time series that corresponds to the volatility of the exchange rate may be a very helpful exercise when carried out over a time period in which the exchange rate is flexible.

To summarize the PPP idea in a nutshell: The PPP exchange rate tends to be equivalent to the short-run equilibrium exchange rate, which is identical with a rate that is allowed to float freely. This is because the PPP is a measure of purchasing power parity. After then, an investigation into the factors that led to the significant gaps between the actual rate and the PPP was carried out. When doing time series analysis, one is able to differentiate between static exchange rate comparisons and PPP comparisons. The time point that occurred earlier in history will be selected in order to preserve the integrity of the comparative-static framework. You can't simply look at the two statistics side by side at various times of the year if you want to make an accurate comparison of the exchange rate and the PPP throughout the course of time. You need to do something else. It is generally accepted that the earlier time point should serve as the base period for the purposes of the comparative-statistics framework.

If the exchange rate fluctuates, the method in question is a kind of time-series analysis, with the most recent time point serving as a fictional "current period." If the exchange rate is fixed, the method in question is a statistical approach. Alternately, if the exchange rate is going to be created at some point in the future, it has to be consistent with the features of the base period. Therefore, the latter era must be one in which the exchange rate is either in long-run equilibrium or, at the very least, a "normal" time. This is because the two conditions cannot coexist. For the simple fact that there is no other option that could work. Comparisons of the exchange rate and PPP throughout the course of time may be clearly distinguished, in contrast to comparisons of the variables gathered at fixed points in time encompassing multiple time periods. In the context of comparative statistics, the older time point is sometimes referred to as the base period.

In the case that the exchange rate does not remain steady, the subsequent time point may be viewed as a fabricated "current period and the approach may be categorized as a subset of time-series analysis. However, if the exchange rate is going to be determined at a later time, the features of that period have to be the same as those of the base period. This leads one to believe that it will take place, in an ideal scenario, during a period of long-run exchange rate stability. Acquiring knowledge about the historical setting in which the structure was first constructed may now be accomplished. You have the option of using the later date if you are attempting to convert one currency to another. If this is the case, click here. The procedure would thus be categorized as a subtype of time-series analysis depending on the specific circumstances. If, however, the exchange rate is to be determined at a later time, the features of the new time period must be the same as those of the base time period. This is because the new time period will serve as the basis for the new exchange rate. However, in order to correctly build the exchange rate, it is necessary that the characteristics of the period for which the rate is to be determined be the same as those of the base period.

This is because the base period is used to determine the characteristics of the period for which the rate is to be built.The features of the latter period, however, have to be the same as those of the base period in order for the exchange rate to be determined at a later date. This leads one to believe that it will take place, in an ideal scenario, during a period of long-run exchange rate stability. This is the primary difference that can be made between foreign direct investment and several other forms

of private capital inflows. Foreign direct investment (FDI) is also affected by the political system (foreign direct investment). Recent evidence has shown this (Hassan & Mahmood., 2013). Countries that do inward research in order to get a footing in their domestic market may choose to attract foreign direct investment (FDI) as part of their trade policy. This technique is known as "inward research." The value of one nation's currency represented in terms of the value of the currency used by the other country is referred to as the exchange rate. The most basic definition of currency conversion is the process of exchanging the money of one nation for the currency of another country. The amount of demand and supply for various currencies is the factor that has the most influence on the degree to which currency values fluctuate. The volatility of currency rates has a direct influence on the choices that decision makers make on whether or not to import or export goods. In addition to this, it provides a comprehensive analysis of the best metrics for the balance of payments, which include production, imports, exports, reserves, and outlays Alterations in the value of one currency in relation to another have an effect not only on the pricing of products that are exported and imported but also on the trade surplus or deficit that a country experiences.

Due to the fortunate position that now exists with the exchange rate, investors in the home nation stand to win significantly by purchasing foreign money at this point in time. The ideal system for traders and investors would have a very small margin of error between the actual exchange rate and the rate that was predicted for the future. Between the years 1986 and 2018, researchers (Adofu & Adegoriola, 2020) investigated the effect that foreign portfolio investment had on the expansion of Nigeria's economy. An autoregressive distributed lag model was used for the purpose of this data analysis. According to the findings of the study, both the present value and the one-period lag of foreign portfolio investments have a detrimental effect on economic development. According to the findings of the study, there is a great deal of diversity in the different kinds of foreign portfolio investments that are carried out in Nigeria.

This analysis comes to the conclusion that a significant reorganization of the economy is necessary in order to win back the confidence of foreign investors. The results indicate that the government should make investment initiatives that are four times more aggressive than they are now. There are many different strategies that governments might use to encourage new investment. These include stepping up

construction of new infrastructure, extending service offering, and making adjustments to the existing regulatory framework (by, for example, lowering profit repatriation requirements).

Empirical literature

According to the findings of the empirical study, the consequences of currency fluctuations, inflation, and corruption on China's foreign direct investment (FDI) overseas are significant and detrimental (Prof. Ma Degonga, et al, 2020). On the other hand, there is only a little connection between the domestic safety and the outflow of FDI. The authors (Barguellil, et. Al., 2018) investigated the relationship between varying exchange rates and the expansion of the economy (2018). An empirical study was carried out on a sample of 45 emerging and developing countries between the years 1985 and 2015 using the differentiation and method generalized methodology of moment's estimators. The time period covered by the inquiry was from 1985 to 2015. Based on these findings, it seems that measures of nominal and real exchange rate volatility that are derived from generic autoregressive conditional heteroskedasticity are harmful to the growth of the economy.

A number of variables, including exchange rate regimes and financial openness, contribute to the exacerbation of currency market volatility. The adverse effects of fluctuating currency prices are more likely to be seen in nations whose governments have adopted flexible exchange rate regimes and a more deregulatory stance towards the financial sector. Mbanasor and Obioma (2017) conducted research on the volatility of the Nigerian Naira and private investments made in other countries by using a two-stage least-squares approach to analyze the data (2LS). The falling value of the Nigerian naira was closely associated with the falling value of foreign direct investment (FDI) entering the country. The evidence that has been given here implies that a reduction of 0.15 percentage points in the volatility of the exchange rate might result in an increase of one percentage point in the amount of private investment from other countries in Nigeria. It is not the country's currency exchange rate that drives the majority of foreign direct investment (FDI) in Nigeria; rather, it is things like the country's imaginative and entrepreneurial spirit, its access to money, and its aim to maximize earnings.

The findings of this inquiry have led to a greater level of consideration being given to this concept. (Iyke & Sin-Yu, 2017) investigated, via the use of the ARDL bounds testing methodology, the relationship that existed between the wildly shifting exchange rates of Ghana's currency and investment in the country between the years 1980 and 2015. According to the findings of the study, fluctuations in the value of a country's currency have both short-term and long-term impacts on domestic investment, and these effects do not always follow the same pattern .To restate, the amount of uncertainty that exists right now is positive for investing, but larger levels of uncertainty were negative to taking such action. Over the long run, domestic investment is helped by fluctuations in the value of the currency. Studies reveal that Nigeria has not only been unsuccessful in bringing in a large amount of foreign direct investment (FDI), but that it has also been losing a considerable part of the FDI that it has brought in (Alobari, et al, 2016). This finding is consistent with the findings of previous research that have been published on the subject. To phrase it another way, foreign direct investment (FDI) is an excellent method to get some much-needed capital for economic development. Not only did the research discover a link between foreign direct investment (FDI) and growing levels of the naira and GDP in Nigeria, but it also provided policy suggestions for the government of the nation, the private sector, and non-governmental organizations (NGOs). It is prudent to take advantage of a country's interest rate and currency rate while they are reasonably steady (AB. et al, 2014). The findings of the research, on the other hand, indicate that FDI has a strong relationship with interest rates (FDI).

According to these findings, variations in interest rates have an effect on foreign direct investment (FDI) because of the impact they have on the value of currencies and the attractiveness of markets .Using SPSS, Muhammad Bilawal, Muhammad Ibrahim, Amjad Abbas, Muhammad Shuaib, Mansoor Ahmed, Iltaf Hussain, and Tehreem Fatima studied variations in exchange rates as well as foreign direct investment (FDI). A value of 0.6779 for the R-squared parameter in the research model implies that Exchange affects 67% of FDI. According to the findings of the study on correlation, there is a constructive connection between the currency exchange rate and the movement of capital. The term "foreign direct investment," abbreviated "FDI," refers to a kind of international capital mobility that allows parent companies and other multinational organizations to take part in the management of their abroad subsidiaries (Goldberg & Charles, 2005). The term "foreign direct investment," also

abbreviated as "FDI," refers to the process by which funds from outside of a country are invested in that country through the operation of businesses, factories, and other institutions that are wholly or mostly owned and operated within that country. FDI is sometimes abbreviated as "foreign direct investment." When it comes to the stock market, the monetary value of FDI is not taken into account at all.

Foreign direct investment (FDI) is preferable to stock investments in a country's businesses, according to one school of thought, because FDI is profitable and stable regardless of the state of the economy, whereas stock investments are sometimes referred to as "hot money" because investors tend to pull out of them at the first sign of trouble in the economy (Bilawal, et al, 2014). In a similar vein, Huchet-Bourdon and Korinek (2011) suggested that foreign direct investment (FDI) is essential to assisting underdeveloped countries in expanding their economies. If there is a likelihood that foreign investors would get returns over the long term, they will be more willing to participate in the production sector of the country that is hosting them. In addition to the obvious role that foreign direct investment (FDI) plays in the development of new capital, it also plays a key role in the transfer of cutting-edge technology and the introduction of newer, more innovative business practices from the developed world to the developing world.

Because the economies of the least developed countries need a greater amount of foreign direct investment (FDI), the governments of these nations provide financial inducements in the hope of luring FDI from other nations. Unlike other forms of private capital inflows such as portfolio investment, foreign direct investment (FDI) involves not only equity-based ownership but also a direct or enduring stake in, and influence over, a business. This is in contrast to other forms of private capital inflows such as portfolio investment (Loungani & Razin, 2001). There are many different indicators that may be influenced by the administration of a nation, but one of them is foreign direct investment. Through the use of a financial strategy known as FDI (FDI), which is facilitated by favorable trade rules, a nation may be able to dominate its domestic market while also raising the living standards of its citizens (Hassan & Mahmood, 2013). The rate at which the currency of one nation may be exchanged for the currency of another country is referred to as the exchange rate. Trading is the act of trading the currency of one nation for the currency of another. Changing patterns in the supply and demand for money are the primary forces that are responsible for the unpredictable behavior of exchange rates.

Changes in the value of a currency pair that are difficult to forecast may have a significant influence on the decisions that a firm makes (Javed & Farooq, 2009). The leadership of a nation may have an impact on a number of different economic indicators, including foreign direct investment (FDI). By using a strategy of global finance known as FDI (or Foreign Direct Investment) (FDI),Currency exchange rates influence both the costs of exporting and importing goods as well as the ability to maintain a positive balance of payments. Given the current situation of the exchange rate, local investors have a tremendous opportunity to earn big profits via the acquisition of foreign currency. This opportunity is made possible by the current status of the exchange rate. The way the exchange rate is now sitting gives us the opportunity to take advantage of this. Traders and investors would profit from a system in which there is a slight difference between the values that are anticipated for the exchange rate and the values that are actually achieved. According to one school of thought, fluctuations in the value of currencies provide possibilities for making a profit (Javed & Farooq, 2009). "indicated that fluctuations in the value of a nation's currency may be able to have two separate influences on the amount of money spent on capital projects" (Harchaoui et al, 2005). Companies stand to gain from an increase in sales both locally and globally, which ultimately leads to increased total revenues as a result of the value of the native currency decreasing in comparison to foreign currencies.

As a direct consequence of this, there will be a higher marginal return on an increase in the amount of capital spent. This advantageous impact, however, is rendered null and void due to the rising variable costs as well as the increasing costs associated with imported capital. The question of which of the theoretical models is the most influential is one that has no definitive solution and remains open. The assertion that fluctuations in currency markets have minimal impact on investment in general is supported by a limited body of research, but not a great deal of it (Harchaoui et al, 2005). There are primarily two methods to comprehend value while talking about monetary terms. When the value of a nation's currency goes down, the price of goods that are imported into that country goes up. Because of this, the importer's domestic demand will increase, which will result in the importer having a larger trade surplus, which will be beneficial to the domestic economy.

A decrease in the value of the currency has the effect of lowering the buying power of consumers, which is the second consequence of this phenomenon. If the value of a country's currency or commodities drops, the cost of that country's exports

will go down, while the cost of that country's imports would go up (Bilawal et al, 2014). It is a common belief that variations in exchange rates have a significant influence on the decision of a firm to engage in foreign direct investment (FDI) (Goldberg, & Charles, 2005). In recent years, a significant amount of research has been carried out in the field of currency fluctuations and FDI as a response to the inadequacies of earlier concepts. Despite this, there is still no consensus in either theoretical or empirical investigations (Chen et al, 2005). Similar arguments were made by Goldberg and Charles (2005) who postulated that depreciation in the destination market's currency would increase the relative wealth of agents from the source country, thereby encouraging more acquisitions of assets in the destination market by overseas investors. (Goldberg & Charles,) argued that a depreciation in the destination market's currency would increase the relative wealth of agents from the source country.

One advantage that comes with a declining destination currency is that it brings down the relative cost of capital for foreign investors. This will be the case to the extent that residents of the country of origin have greater wealth denominated in their country's currency. A constant reduction in the relative wealth of local people, as illustrated in a model of an imperfect market that was supplied by, may encourage individuals to make purchases outside of the country if a depreciation of the local currency is implemented (Froot & Stein, 1991). It is important to note that academic studies have produced a large number of distinct theoretical explanations for changes in currency values. This is an essential aspect that must be taken into consideration. These models provide light on the manner in which changes in currency exchange rates influence business activity and give insight as to how such shifts occur. This is the broad direction that many of the assumptions that are included in these models go, including those concerning how comfortable individuals are with taking risks. It is common practice to attribute the inverse relationship that exists between shifts in exchange rates and trade volumes to the fact that transaction costs are higher.

A variety of factors, such as the unpredictability of exchange rates and the significant transaction costs associated with currency conversion, act to impede the progress of international business. The level of risk aversion that a company exhibits is one of the aspects that have been the focus of a number of different theories developed to analyze the impact that shifting currency rates have on companies. According to the findings of (Ibrahim et al, 2014) and other research (Ibrahim et al,

2014), domestic businesses that rely heavily on imported inputs in their production may experience negative effects if the value of the currency exchange rate decreases (Harchaoui et al, 2005). This is due to the fact that a decrease in the value of a country's currency exchange rate results in a rise in the variable cost of production as well as the user cost of capital, which in turn results in a decrease in the marginal profit of investment.

When a firm chooses to shift manufacturing of its products from its home nation to the host country, this is an example of foreign direct investment (FDI). This happens when the benefits of moving production outweigh the costs of moving production. When determining where in the world to make investments, a key consideration will be given to the potential future headquarters of multinational corporations (FDI). The stability or instability of a nation's currency exchange rate has a significant impact on the amount of foreign direct investment (FDI) that flows into and out of that country. The variations in the value of one currency in comparison to another may have a large and lasting influence on the cost of producing a product. The greater the degree of uncertainty, the less optimism investors have towards the economy of the host nation. Alternately put, the risk of incurring a financial loss in an investment increases if there is more volatility in the market (Cushman, 1985).

The relationship between foreign direct investment (FDI) and shifts in the level and volatility of currency rates has been the subject of investigation in a great number of empirical research. In some of these studies, the influence of shifting investor expectations for future exchange rates was also investigated. The traditional rationale given for such a gain in value is an increase in the number of holders of a currency located in other countries. As a result, it is feasible that they may be able to purchase shares in domestic companies at a price lower than that paid by local investors. According to studies conducted by Baek and Okawa (2001), the amount of Japanese foreign direct investment (FDI) in Asia rises as the yen strengthens against the dollar and against other Asian currencies.

Cushman (1985) conducted research on the relationship between currency exchange rates and foreign direct investment (FDI). An increase in the value of a country's currency might either encourage or discourage foreign direct investment (FDI), depending on the circumstances. In one of the probable outcomes, this kind of investment is encouraged. When applied to the other, it produces the impact that is contrary to what was intended. Research conducted by Bénassy-Quéré et al. (2001)

reveals that variable exchange rates inhibit foreign direct investment (FDI). When the dollar is strong, there is a greater likelihood of investment in Europe by American corporations (Caves, 1982). According to the report, a higher exchange rate stimulates direct investment, which in turn lowers the costs of production Barrell and Pain, (1996). They asserted that this would result in a lower opportunity cost for the investment if the exchange rate were to be higher. Empirical research is being done on the factors that contribute to falls in foreign direct investment (FDI).

Only the connection between foreign direct investment (FDI) flows and general currency rates are discussed in this article. Amuedo-Dorantes and Pozo (2001) conducted research in the United States to investigate the impact that foreign direct investment (FDI) inflows had on the level and volatility of currency exchange rates between the years 1976 and 1998. The researchers were unable to demonstrate a correlation between the two variables in the short term that was statistically significant; nevertheless, the data did suggest that outflows of foreign direct investment increased in parallel with volatility in currency markets. According to research conducted by Takagi and Shi (2011), which examined the correlation between currency depreciation in the host nation and Japanese foreign direct investment (FDI) inflows to nine Asian countries between the years 1987 and 2008, this correlation was found to be statistically significant. This finding was arrived at as a result of their research on the monetary systems of nine different Asian countries. When there is higher volatility in the value of the currency, it draws a bigger amount of foreign direct investment (FDI).

This pattern demonstrates how foreign direct investment is increasingly taking the place of exports as a source of revenue for a number of countries. On the other hand, this discovery is in direct opposition to an article that was published in 1981 by Itagaki and Cushmans (1985). It would seem that investors from all over the globe are raising their expenditure in order to compensate for the unfavorable effects that currency fluctuations have on their businesses by sponsoring the production of similar new commodities. Nevertheless, other research demonstrates that when values of foreign currencies are erratic, foreign investors either postpone or completely withdraw their investments (Dixit, 1989; Campa, 1993; Kiyota & Urata, 2004). Blonigen (1997) indicated, based on data on Japanese purchases made in the United States between the years 1975 and 1992, that fluctuations in currency exchange rates may have an effect on the purchase of FDI. This is due to the fact that getting FDI

often involves making purchases of firm-specific assets denominated in the foreign currency, which may give returns denominated in a different currency than the initial investment.

Blonigen et al. (1991) get to the same result, claiming that real dollar depreciations boost foreign purchase, but they arrive at their conclusion using different approaches. Both of these authors are of the opinion that a weakened dollar will stimulate people to shop in other countries. Currency exchange rates are volatile because of the faults in the functioning of the financial markets, as Froot and Stein point out, and they want their readers to be aware of this reality. The results of Blonigen et al. (1991), on the other hand, indicate the significance of changes in currency. For one thing, although both domestic and international businesses might have comparable access to the same domestic market for the purchase of firm-specific assets, this does not necessarily mean that they have comparable access to the same domestic market for the generation of profits from these assets. In a global economy in which some countries have greater access to markets than others, fluctuations in the value of a country's currency may have a disproportionate effect on the percentage of a company's acquisitions that are based in that country compared to the percentage that are headquartered in other countries.

The prediction made by Blonigen has been validated by our research, which demonstrates a positive and statistically significant correlation between the amount of Japanese mergers and acquisitions activity and the exchange rate. In spite of this discovery, it is still unclear whether the connection between currency fluctuations and Japanese FDI acquisition is due to the presence of firm-specific assets (as Blonigen [1991] maintains) or to the imperfect capital market hypothesis put out by Froot and Stein. These two hypotheses have been offered as explanations. Blonigen divides purchases into two groups, manufacturing and the rest of the economy, to see whether the idea holds. Why? Because it's often believed that manufacturers don't place a high value on intangibles. The real exchange rate has a co-efficient that is statistically inconsequential for businesses that are not involved in manufacturing, but is very important for manufacturing industries, as shown by Blonigen (1991)'s study (Osinubi, Amaghionyeodiwe FDI and Exchangre Rate in Nigeria, 1989). Blonigen (1991) then classifies manufacturing sector acquisitions into two groups, high R&D spending (as a proportion of sales) and low R&D spending (as a percentage of total expenditures) (as a percentage of sales). Given the importance of technology-related firm-specific

assets, the value of investments made by Japanese corporations that have a vested interest in acquiring foreign direct investment (FDI) in companies with high rates of research and development expenditure should be more sensitive to fluctuations in exchange rates.

This is because of the nature of the vested interest. Regressions on high and low R&D manufacturing sectors reveal that the coefficient on the real exchange rate variable is statistically insignificant for the low R&D sample and highly positive for the high R&D sample. The fact that the coefficient is considerably positive for the high R&D sample is proof of this, since it demonstrates the point. Blonigen (1991) is able to provide support for his assertion that fluctuations in exchange rates have an effect on foreign direct investment (FDI) because of firm-specific assets by first classifying Japanese acquisitions according to whether they were made in the manufacturing or non-manufacturing industries, and then classifying acquisitions made in the manufacturing industry according to whether they were high or low R&D samples. This allows Blonigen to demonstrate that fluctuations in exchange rates have an effect on FDI because of firm-specific assets. Research was carried out by Udomkergmogkol and Morrissey on a variety of issues, including international currency exchange rates and direct investment from foreign nations (2009).

According to the findings, a depreciation of the currency may be able to attract foreign direct investment (FDI), but changes in the value of the local currency may be able to discourage FDI. In order to do a volatility study, the H-P filter approach is used .An increase in the real effective exchange rate is considered to be a depreciation of the currency and may cause a delay in investment from direct foreign sources. Utilizing the Fixed Effects Method OLS and the GMM Arellano et al. (2003) conducted research to evaluate the effect that currency rate uncertainty has on foreign direct investment (FDI) for a total of 32 distinct countries. We were able to assess the amount of volatility, which research has proved to be a factor that is detrimental to FDI. The technique that we used was called GARCH. The influence of exchange rate volatility on US foreign direct investment (FDI) in Europe and the United Kingdom was analyzed by Barrell et al. (2003) Using a sample from seven different industries and applying the GMM statistical method between the years 1982 and 1998. The study was conducted between Europe and the United Kingdom. In particular, they discovered that there is a very substantial negative correlation between foreign direct

investment from the United States and the volatility of currency rates in Europe and the United Kingdom. This was one of the most important findings that they made.

A research that looked at how changes in currency rates affected the ability of G-3 countries to attract foreign direct investment (FDI) concluded that maintaining a stable exchange rate was very important. In order to categorize the globe into its many different areas, we used yearly data from 1975–1998. According to what the researchers found, countries still developing their economies saw lower levels of foreign direct investment (FDI) when exchange rates were more unpredictable. Depending on the degree to which a nation is open for business, variations in currency rates may have varied degrees of influence on foreign direct investment (Furceri & Borelli, 2008). Depending on the level of economic openness of the nation in question, fluctuations in the value of a currency's exchange rate may have a positive influence, a negative one, or no effect at all on foreign direct investment (FDI).

According to the findings of Bouoiyour and Rey (2005), which were based on an examination of yearly data from 1960-2000, neither standard deviation-measured volatility nor misalignments of the real effective exchange rate had an influence on foreign direct investment into Morocco. An empirical study was carried out by researchers Tokunbo and Lloyd (2009) with the purpose of determining how fluctuations in the value of the naira effect foreign direct investment in the country. The link between changes in exchange rates and foreign direct investment (FDI) was investigated in this research; nevertheless, the authors of the study came to the conclusion that there was no such connection.

Nevertheless, the findings from using cointegration and error correction approaches revealed that a weakening of the destination currency was related to an increase in the amount of FDI flows. Jie (2000) established theoretically that there is a positive correlation between exchange rate volatility and two-way FDI in a basic economy with one sector and two countries. This link was shown to be true even when there was only one country involved. This study investigates the benefits of implementing foreign direct investment (FDI) in both ways to disperse risk, with a particular emphasis on the influence of currency rate risk. Goldberg and Kolstad (1994) used quarterly data to demonstrate that multinational corporations (MNEs) set up business in a variety of countries as a result of the volatility of exchange rates. They demonstrated this by showing that multi-national corporations are more likely to locate their headquarters in countries that provide favorable conditions for business.

More market volatility leads to an increase in production for those nations who are best positioned to capitalize on the opportunity.

These countries include the United States of America, Canada, Japan, and the United Kingdom. According to Aizenman (1992), the impact of various exchange rate regimes on the behavior of local and foreign investors may be classified in a number of distinct ways. Depending on the kind of exchange rate regime that is currently in place, the relationship between investment and the volatility of the exchange rate will either be negative or positive. Nations that have a flexible exchange rate will display a positive correlation if the shocks are real, but the correlation will be negative if the shocks are nominal. If the shocks are genuine, then countries with a flexible exchange rate will exhibit a positive correlation. If the shocks are really genuine, then there will be a positive correlation between the two variables. Nimesh (2009) conducted research on how the rising levels of Chinese foreign direct investment influence the economies of Asian countries

The Arellano Bond and Instrumental variables models were used to panel data obtained from 111 Asian host economies between the years 1989 and 2004. This allowed for estimates to be generated. The research takes into account a variety of factors, including the size of the market, the availability of infrastructure, the degree of openness, and the degree of currency rate volatility. The appreciation or depreciation of one currency in relation to another may be able to explain a variety of other occurrences that have been baffling researchers. Currency swings are detrimental to U.S. foreign direct investment. On monthly data spanning from 1990 to 2007, linear and non-linear cointegration models were used in order to investigate Pakistan's economic response to incoming capital (Rashid & Fazal, 2010). According to the findings, increased levels of capital have been a contributing factor in inflation as well as monetary expansion. Currency swings are being made worse by the circulation of capital. It was discovered by Becker and Hall, (2003) that due to the volatility of the Euro-Dollar exchange rates using GMM, foreign direct investment in research and development has a tendency to reallocate from Europe to the United Kingdom. The reason for this is because of the United Kingdom's strong economy. A common use for the GARCH model is that of a risk assessment instrument. Variations in output, as well as changes in short-term and long-term interest rates, are important considerations. Arbatli (2011) has carried out an in-depth study to determine the elements that contribute to increased levels of foreign direct investment. He took into

account not only local but also international factors, such as national macroeconomic and institutional variables. He did this in his analysis.

The data collection included the years 1990-2009 and contained information from 46 different countries. It is more probable for there to be foreign direct investment (FDI) under a system that has a set or regulated floating exchange rate as opposed to one that has a freely floating exchange rate. Muhammad Bilawal and his colleagues do research on how Foreign Direct Investment (FDI) affects Pakistan's currency market. They observed that the annual foreign direct investment (FDI) inflows into Pakistan were evidently strongly impacted by the exchange rate throughout the course of the research's time period. In addition to this, they discovered a strong and positive correlation existing between the value of a currency's exchange rate and FDI. They found that the exchange rate had a 67.9% impact on the amount of FDI that was invested in Pakistan during the course of the study project. As a result of this, they arrived at the decision that the model that was used is sufficient for producing accurate forecasts about the variable that was the subject of the study.

There was evidence that exchange rate volatility had a favorable effect on FDI (Goldberg & Kolstad 1995; Bailey & Tavla 1991). On the other hand, Ullah, Haider, and Azim (2012) as well as Udoh and Egwaikhide (2008), Brzozowski (2006), and Schiavo (2007), Udoh and Urata (2008), and Ullah et al. (2012) all found that there was a significant correlation between the two variables. Russ (2012), on the other hand, was unable to locate any evidence to support the existence of this link. While this is true, Goldberg and Kolstad (1995) first developed a theoretical model that describes the relationship between FDI, exchange rate fluctuation, and demand uncertainty. In this article, we take a look at the lexical facets of the aforementioned research initiatives. For example, Bailey and Tavlas (1991) examined the relationship between shifts in exchange rates and foreign direct investment (FDI) by conducting an analysis of quarterly data for the United States between the years 1976 and 1986. Because they encompass the whole time period that is represented by these data, the years 1976-1986 were selected. In the research, a stock adjustment model was used to investigate the effects of misalignment as well as the impact of fluctuations in exchange rates. In the short term, it was found that volatility was beneficial to U.S. foreign direct investment (FDI), but only slightly. When the relative price term was taken out of the equation, the outcomes of the research revealed that the volatility variable only had a significant impact on the outcome in a negative way when

compared to the absence of that term. The results of the study indicated that the researchers' fears regarding the influence of probable currency fluctuations on the investment were unwarranted, which meant that the researchers' concerns were baseless.

In order to evaluate the efficacy of the theoretical projections, they examined information on FDI transactions that had already taken place between the US and the UK, Japan, and Canada. They came to the conclusion that there is a connection, although a positive one, between foreign direct investment and demand uncertainty. The information was extracted from quarterly reports that were kept from 1978 all the way through 1991. We employed the standard deviation approach together with averaging the data across 12 consecutive quarters to provide an accurate picture of the exchange rate's degree of volatility. The average exchange rate was chosen to serve as the basis for an internal standard. Nevertheless, genuine depreciations of the source country's currency were connected to decreased investment shares on foreign markets; the repercussions, however, were quite slight. The researchers arrived to the same conclusion by using both the ordinary least squares technique (OLS) and the generalized method of moments approach (GMM).

When compared to alternative approaches to estimation, the hypothesis that there is a statistically significant connection between the volatility of exchange rates and the performance of investment portfolios is not supported by the data. How much of an impact did the weakening of the yen in 1999 and 2000 have on Japanese foreign direct investment (FDI)? This is the issue that is being investigated by research carried out by Kiyota and Urat (2004). The objective of this study was to conduct quantitative analysis, which was accomplished via the use of a panel data modeling technique and the application of the feasible generalized least-squares (FGLS) estimate method. They were able to investigate how the concept of "one price" across markets influences real exchange rate volatility by taking into account fluctuations in foreign direct investment (FDI) between regions and sectors. With all of this information at their disposal, they may choose whether or not to implement the idea. According to the findings of the study, a fluctuating currency exchange rate is a deterrent to FDI. Brzozowsk (2006) investigated how foreign direct investment was impacted by factors such as political unpredictability and fluctuations in currency exchange rates. To better understand the role that volatility and uncertainty play in foreign direct investment (FDI) flows, many measures of volatility and uncertainty have been developed and

examined. During the course of this study, we used GMM in conjunction with many other panel data techniques, such as fixed effect and dynamic panel data models. According to the findings of the study, the instability and unpredictability of currency rates had a negative impact on the decision to put assets in countries that were in the process of transitioning into the international community or joining it. Research on foreign direct investment in Nigeria was carried out by Udoh and Egwaikhide, (2008). In particular, they investigated the effects that monetary instability and worries of inflation had on the nation from 1970 to 2005. Their focus was on the time period between those two years. Combining the ordinary least squares method with the generalized autoregressive conditional heteroscedasticity (GARCH) model allowed us to get the volatility variable that was required for this investigation.

Evidence suggests that fluctuations in the value of the Nigerian naira have had a negative impact on foreign direct investment (FDI) in the country. Ogunleye (2009) investigated the dynamic link between exchange rate volatility and the inflow of foreign direct investment (FDI) in Nigeria and South Africa by using a method known as two-stage least squares. This method was used to study the relationship. This study produced a volatility index for currency exchange rates by using the GARCH model as its basis. According to the findings of the study, shifts in the value of the naira contributed to a drop in foreign direct investment (FDI) into both Nigeria and South Africa. Foreign direct investment (FDI) from the United States to six chosen partners between the years 1984 and 2004 was investigated by (Schmidt & Broll, 2009) in order to identify the influence of exchange rate uncertainty, exchange rate volatility, and expectations. In this analysis, we used two distinct types of volatility: (1) the expected future changes in the real exchange rate and (2) a volatility measure adopted from the work of Kiyota and Urata, (2004). The latter is a specification that captured only a portion of the real exchange rate volatility that was not explained by factors already known to the investments. Specifically, we used these two types of volatility to determine whether or not an investment would be profitable.

The study conducted by may be used to support both of these indications Kiyota and Urata (2004). The forecasts for the actual exchange rate were the first measure that was used. According to the findings of the study, the flow of foreign direct investment (FDI) out of the United States was impacted by the standard deviation of exchange rate volatility across all sectors. The alternate method, on the other hand, resulted in a decrease in the amount of foreign direct investment (FDI) into

the manufacturing sector while simultaneously resulting in an increase in FDI into the non-manufacturing sector. A report on foreign direct investment in Iran was finished in the year 2012 (Sharifi et al., 2012). The authors took into consideration, among other things, fluctuations in the value of various currencies. In this inquiry, a cointegration analysis was performed on a quarterly data series covering 1980–2006 using the Johansen and Julius technique. The time period of this investigation was from 1980–2006. The purpose of this study was to investigate a vector autoregression model that had both a variance decomposition and an impulse response function as one of its components. For the purpose of better visualizing the degree of volatility in the exchange rate, the standard deviation of the moving average exchange rate was used.

According to the findings of the research, fluctuations in the value of the Iranian currency have a detrimental effect on foreign direct investment (FDI) in the country. (Ullah et al.2012) conducted research from 1980 to 2010 on Pakistan's foreign direct investment (FDI) to determine whether or not the country's fluctuating exchange rate had an effect on FDI and, if so, how that influence manifested itself. Quantification of volatility was accomplished with the use of the GARCH model. Additionally, an error correction model and a Granger causality test were included into the research. The study came to the conclusion that changes in the exchange rate were a Granger cause of foreign direct investment in Pakistan; but, FDI in and of itself did not cause fluctuations in the value of the country's currency. According to the findings of the research, variations in currency exchange rates were an unfavorable factor in foreign direct investment (FDI). Researchers from Pakistan, India, and Sri Lanka investigated Foreign Direct Investment (FDI) flows between 1981 and 2013 as part of a study Azhar et al. (2015) that looked at how currency variations influenced FDI flows. Every single one of these nations is a member of the SAARC (SAARC).

The GARCH (1,1) model was used in order to compute the exchange rate volatility, and the GMM estimate technique was utilized throughout the whole of the country-by-country analysis. The findings indicated that all three countries had a difficult time enticing FDI owing to changes in their respective currency rates (FDI). According to the results of a number of studies, changes in exchange rates are beneficial to foreign direct investment (FDI), which has been proven to profit from these movements. Chakrabarti and Scholnick (2002) conducted an analysis of the influence of exchange rate expectations on foreign direct investment (FDI) inflow for 20 OECD countries

using monthly data from 1982–1995. Particular attention was paid to the period beginning in 1982 and ending in 1995. The study examined the monthly average exchange rate, as well as its standard deviation and skewness, in order to get insight into the expectations of investors, their attitudes on risk, and their reactions to rapid movements in the currency market. The researchers analyzed the panel data using not one, not two, but three different statistical approaches: the fixed effect, the random effect, and the modified least-squares methodology. These methods are referred to together as the FRET method. The findings of this study indicate that foreign direct investment (FDI) inflows are affected slightly negatively by exchange rate volatility; however they are strongly influenced favorably by the skewness of devaluations.

In most cases, the flow of foreign direct investment is not significantly affected by a decline in the value of a country's currency over the course of one year) . Schiavo (2007) evaluated data from a subset of 25 OECD member nations as part of his investigation of the impact that currency unions had on the amount of foreign direct investment (FDI) that was received between the years 1980 and 2001. In order to provide an explanation for the findings of the inquiry, a log-linear gravity model was used, and the number of inputs used was kept to a bare minimum. The short-term indicator was used to capture short-term variations in exchange rates, while the long-term indicator was used to identify longer-term misalignments. Both indicators were employed simultaneously. During the analysis, we combined these two different metrics into one.

The study, which included OLS and tobit analysis, came to the conclusion that having a single currency decreased the risk associated with investing across international borders. Russ (2012) investigated the links between shifting currency exchange rates and foreign direct investment (FDI) inflows. This report was compiled using data collected from 28 different OECD countries between the years 1980 and 2005. For the purpose of this investigation, we made use of a panel data analysis, using OLS, FGLS, and GMM techniques. According to the findings of the study, foreign direct investment (FDI) flows are unaffected by fluctuations in exchange rates; nevertheless, a system in which exchange rates remain constant results in an increase in FDI flows from peg partners. Dunning was the first person to write a theory on foreign direct investment (FDI) in the late 1970s. He postulated that companies may benefit from being global for a variety of reasons, including earning an ownership advantage, a geographical advantage, or an internalization advantage. He pioneered

the endeavor and was the first to do it. The "OLI paradigm," as this concept is usually referred to, was discovered to be a useful instrument for bringing together many facets of business by economists, especially development economists. Studies show that a decrease in the value of the dollar is connected with an increase in foreign direct investment (FDI) coming from the United States Klein and Rosengren (1994). This finding lends credence to the research that Froot and Stein conducted some time ago. Despite this, Stevens, (1998) comes to the conclusion that the empirical results of Klein and Rosengrens as well as Froot and Stein are credible due to the manner in which the researchers specified their models. Additional study on the impact that shifting exchange rates have on foreign direct investment into the Japanese economy was carried out by (Blonigen 1997). On the other hand, he outlined the several pathways via which changes in the values of currencies exchanged between countries influence foreign direct investment (FDI) (FDI). He was interested in finding out whether or not the value of a country's currency causes an increase in the likelihood that a country's transferrable assets will be sold to foreign firms operating in global markets when compared to indigenous businesses that do not have access to these markets. He wanted to know whether or not this is the case.

In order to achieve this goal, he investigated Japanese mergers and acquisitions activities as well as foreign direct investment on an industrial scale in the United States. The popular wisdom is that if there was a drop in the value of the dollar in comparison to the yen, there would be an increase in Japanese corporations' investments in the United States. His results gave this theory further validity. According to the findings of Blonigen, the sensitivity of a company's capacity to attract foreign direct investment (FDI) to changes in the value of its currency was greatest in the high-tech industry. This is due to the fact that a company's unique resources could be worth a significant amount. The results of a number of research have demonstrated that variations in currency rates over short time periods may have an influence on direct investment from outside (foreign direct investment).

The assertions made by Blonigen (1997), Froot and Stein (2001), as well as Swenson et al, (1991) have been backed up by research and may be considered credible Kogut (1996), and Chang (1991). Some academics, such as Bloginen (1997) and Froot and Stein (2001), contend that changes in currency exchange rates have a major influence on the amount of foreign direct investment (FDI), however other scholars dispute this contention (FDI). The author explained why a decline in current

FDI happens when exchange rate uncertainty encourages enterprises to postpone investing in a market by utilizing a theory that was created by Campa (1993). The theory is called the choices theory (Dixit, 1989). Arbenser (2007) used the general equilibrium method to the research problem of analyzing foreign direct investment (FDI) into Ghana. The hypothesis stated by Campa (1993) was investigated by Goldberg and Koldsad (1995), and the results of their study corroborated the conclusions reported by Camza and Arbenser (2007) looked at how foreign direct investment (FDI) comes into Ghana and used a general equilibrium method.

In particular, he investigated the impact of a change in the country's position toward foreign direct investment (FDI) and commercial trade on family incomes and other important macroeconomic variables in pre-1980 Ghana. This change in stance was directed toward commercial trade and FDI. The following are some excerpts from his analysis, as well as his conclusions. Because of the decline in the value of the currency, a greater quantity of goods were sent out of the nation. The outcome was a narrowing of the deficit between exports and imports in terms of trade. He also found that decreasing tariff levels would increase domestic demand for imports, which would lead to an increase in the quantity of imports. This was another one of his discoveries. One of his many important steps forward! A rise in the total quantity of money that is now in circulation would result in a depreciation of the value of the currency used locally.

As a result of the currency depreciation, there would be a multiplier effect on exports, which would lead to an increase in demand and an overall increase in shipments. As a consequence of this, the imbalance in trade would become better. According to the findings of the study, in order to raise the quality of living for Nigerian families, it would be necessary to take two separate actions: the first will be to encourage direct foreign investment, and the second will be to reduce tariffs. Academics from countries with a higher standard of living have always identified a positive association between the two variables when they investigate the correlation between declining local currencies and increasing amounts of foreign direct investment (FDI) (Froot & Stein, 1991).

However, contrary to what was first thought, Froot and Stein were incorrect, as revealed by Campa (1993) and other research. This was proved to be the case by Froot and Stein (1991). There have been a number of studies that have come to the conclusion that a fall in a country's currency would be helpful for attracting foreign

direct investment (FDI), while others have found the exact opposite to be true. According to the findings of the research that was analyzed for this article, investors seem to put a bigger value on past expenditures than they do on future income. As a result, investors will have a significant amount of interest in a market that has interest rates and currency exchange rates that are generally steady. We'll be using data from Ghana in the following two chapters to determine if Campa (1993), who argues that there is no such link, or Froot and Stein (1991) are correct in their interpretation of the data. According to Campa (1993), such a relationship cannot be established by the evidence that is now available. On the other hand, the reality is somewhat different from what is said in Campa (1993), which is an important point to note. The biggest levels of foreign direct investment (FDI) are seen in currencies that have the lowest values, which suggests that there is some validity to this theory.

This occurs as a result of the constant movement of funds back and forth between the two countries (Bleaney & Greenaway, 2001). Recent studies that investigated the link between shifts in monetary policy and foreign direct investment (FDI) inflows used the assumption that there were no restrictions on the free movement of capital throughout the globe in 1990. Research into the relationship between shifts in currency values and foreign direct investment (FDI) has led to the development of a number of potential solutions (FDI). The assumption is often made that there is sufficient material for everyone to have their own share. According to this idea, foreign direct investment should pay particular attention to this market because changes in the value of currency exchange rates may have an effect on the comparative quality of life in the country of origin and the country of destination. Although a number of studies, including one that was conducted in 2001 by Fontagne and Revil, have found a positive correlation between fluctuations in exchange rates and foreign direct investment (FDI), the researchers have reached the conclusion that this correlation has a negative impact on the amount of FDI that flows into economies that are still in the process of developing. Investors run the risk of incurring losses when there is a great deal of volatility in the rates of exchange. In the name of science, study was carried out, and the findings backed up this conclusion (Bleaney & Greenaway, 2001).

There is a greater inflow of foreign direct investment (FDI) into nations where the yen is depreciating, as opposed to countries where the yen is appreciating, when there is a

smaller inflow of FDI (Kiyota, 2004). Second, there has been an increase in foreign direct investment (FDI) in the form of export platforms. These platforms enable the export of intermediate goods to other countries as opposed to the country of origin. The amount of direct investment from overseas is determined by a variety of variables that are specific to the host nation but have no effect on the cost of importing or exporting goods originating in the third nation (e.g., Blonigen et al., 2007; Ekholm, et al., 2007). When it comes to foreign direct investment (FDI) in export platforms, the appreciation of the home currency may have a lesser influence on investor behavior. This is because the impact of changes in the bilateral exchange rate may have a smaller effect on exports to third nations. The level of horizontal foreign direct investment (FDI) is determined by the level of balance that exists between fixed production costs in the host country and export costs. This is because horizontal FDI involves multinational corporations engaging in the same economic activities overseas as they do at home (Markusen, 1984).

If the country in where your company is based has a substantial local market, you may be able to reduce the costs associated with exporting items and so balance the fixed costs of operating the business. Using a strategy of horizontal foreign direct investment is the approach that makes the most sense for a firm whose headquarters are located in one developed nation ("home country") and which desire to enter the considerably bigger market of another developed country (the "host country"). A rise in the value of the domestic currency may be conducive to an increase in the amount of horizontal FDI from other nations (FDI). This is due to the fact that a reduction in fixed costs in the host country would render any savings on export costs null and void. In response to the strengthening of the yen by sixty percent beginning in 1985, several Japanese multinational companies (MNCs) moved their manufacturing operations to other Asian nations. This marked the beginning of considerable foreign direct investment (FDI) flowing out of Asia (Thorbecke & Salike, 2013). Research on foreign direct investment (FDI) in Asia typically focuses on a single major source nation, such as China (Chou et al., 2011; Kang & Jiang, 2012), Japan (Encarnation, 1999); (Lakhera, 2008), Malaysia (Goh, et al., 2013), Singapore (Chellaraj, et al., 2013), or Taiwan (Chellaraj et al., 2013). However, recent studies have shown that FDI flows across multiple countries (Chellara,j et al., 2013). (Chen & Aquino, 1998).

There haven't been many studies done on foreign direct investment (FDI) inside Asia (intra-Asian FDI). Both Hattari and Raja (2008) and Rajan and Hattari (2009) use a gravity framework to investigate the factors that encourage or discourage foreign direct investment (FDI) between Asian countries. They do this by utilizing a dataset with 14 host countries and 10 source countries from 1990 to 2005 and the same empirical approach. Additionally, both studies use a gravity framework to investigate the factors that encourage or discourage foreign direct investment (FDI) between Asian countries (Tobit regression). In each of these studies, in addition to the typical variables—such as GDP and distance—the regression analysis also takes into account a variety of other characteristics. When researchers examine the factors that influence foreign direct investment (FDI) across emerging Asian nations, they find that exports, a common language, currency rates, stock market capitalization, financial openness, corporate tax, political risk, and free trade agreements all play a role in the process. (Petri, 2012) analyses bilateral FDI flows between 85 countries from 1998 to 2003 by utilizing dummy variables to represent intra-Asian features in 16 Asian countries. The time period covered is from 1998 to 2003.

In order to accomplish this, he utilized a gravity modeling strategy that included censored Tobit regression. During this process, he came to the realization that, in contrast to global FDI, intraregional FDI in Asia is drawn to host nations that have less developed technology and strong IP rights protection. There has been a significant increase in the number of research publications published over the last decade that investigate the connections between China's expanding economy, green policies, foreign direct investment, and freer trade. Indicators of foreign direct investment (FDI), such as flows, stock, FDI per capita, and the ratio of FDI to GDP, have also been used in a broad variety of settings across the body of academic research. FDI per capita is one of these contexts. Foreign direct investment (FDI) is something that most host governments, particularly in developing countries, have long anticipated will have good benefits on their economies through knowledge spillovers and better economic growth chances (Slaughter, 2002).

Despite this, there is an increasing body of research suggesting that the success of foreign direct investment (FDI) in host countries is tied to the state of the local market (Borensztein, et al., 1998; Xu, 2000). These impacts might originate from causes outside the system or from inside the system itself (Hoffmann, 2001; Kheng, et al., 2016). It is possible that foreign direct investment (FDI) will have a significant

influence on the growth of human capital. In addition, foreign direct investment (FDI) may have an endogenous influence, which indicates that the amount of FDI received is determined by the preexisting level of human capital in the economy that is the recipient of the investment. This is an important point to keep in mind. Based on these findings, it seems that the majority of developing countries may be susceptible to the feedback effects of FDI and human capital. While Hoffmann (2001) uses a general equilibrium model to confirm a bidirectional causal relationship between human capital (skilled labor) and inward FDI, Dougal (1960) analyzes the effects that this relationship has on the common good in response to the growing interest in the spillover effects of FDI. A general equilibrium model demonstrates that human capital, often known as skilled labor, and foreign direct investment (FDI), have ties that are mutually reinforcing for one another (Hoffmann, 2001). Hussain and Hussain (2016), in order to examine China's foreign direct investment (FDI) in Pakistan, study data from 1984 to 2014 across three different fields.

These dimensions are market size, FDI inflow, and Chinese FDI in Pakistan respectively. The study reveals that Pakistan's trade liberalization policy favors foreign direct investment (FDI), and that the infrastructure being built as part of the CPEC project would offer up investment opportunities for investors other than those from China. According to the findings of a number of studies, the environment for foreign direct investment (FDI) in Pakistan is forecasted to become more favorable in 2019 and 2020. According to a report by Siddiqui (2020), in the publication The Tribune, Chinese foreign direct investment (FDI) in Pakistan allegedly hit $487 million in December 2019, marking a 30 month high. This milestone was apparently achieved after two and a half years. During the first six months of the fiscal year 2019/20, the State Bank of Pakistan was responsible for recording almost a third of the total foreign direct investment (FDI) that was received.

Furthermore, the literature presents a variety of avenues via which foreign direct investment (FDI) could boost human capital levels in developing countries. This is important because foreign direct investment (FDI) may have an effect on the creation of human capital. According to the findings of a demand-side analysis that made use of data from Slaughter and Willem, there are three potential ways that FDI inflows might promote human capital creation. These kinds of processes are covered in Slaughter (2002), with some examples being investments in fixed assets, technical spillovers, and transfers of technology. Despite the fact that this process is little

understood and documented on the supply side, foreign direct investment (FDI) may have an influence on human capital development via its impact on the general education level, as well as formal and informal on-the-job training.

It has been postulated that when a nation obtains foreign direct investment (FDI), the employment and wage structures of that country's economy transform, which ultimately results in the formation of human capital as a consequence of the skilled workforce. These effects might be seen as unintended repercussions, often known as supply-side implications, of FDI on the methods by which human capital is generated (Michie, 2001). Miyamoto (2003). This study focuses on a selection of the articles that are the most relevant to the issue of the variables that drive foreign direct investment (FDI), despite the fact that there is a significant quantity of research on the subject of the factors that drive FDI. Urata and Kiyota look at whether or not foreign direct investment is connected to the worth of a nation's currency, its volatility, and the amount of FDI in that nation (2001). For the purpose of this study's analysis, data on monthly inbound FDI flows and a fixed RMB/USD exchange rate were maintained throughout the period of July 2005 to December 2010.

According to the results, an increase in the value of the RMB would likely result in an increase in the amount of foreign direct investment (FDI), and a sizeable inflow of FDI would likely cause the value of the RMB to increase. An example sentence: Barrell et al. (2004) conducted research on foreign direct investment from the United States into Europe. Specifically, they investigated the effect that fluctuations in currency rate had on the FDI. According to the estimations, the United States maintains a favorable net export investment position across seven distinct industrial sectors in the United Kingdom and Continental Europe. Their research indicates that American companies prefer low-risk environments and have a lower propensity to invest when there is instability in the market for currency exchange rates. It doesn't matter how competitive the market is for the company in issue; the United States still spends about the same amount of money in other countries. Udomkerdmongkol et al. (2006) conduct an analysis of the impact of exchange rate fluctuations on foreign direct investment (FDI) flows from the United States to 16 countries with emerging markets.

This inquiry will focus on a selection of nations that have economies that are still developing. The time period of interest begins in 1990 (when the first panel data collection was place) and ends in 2002. (when it ended). The study discovered that the

quantity of foreign direct investment a nation received was inversely proportional to the probability that the value of that country's currency would decrease. The findings of the study demonstrated this link. Osinubi and Amaghionyeodwe look at the effect that Nigeria's drastically fluctuating exchange rates have on Foreign Direct Investment (FDI) (2009). They use an error correction model in conjunction with an OLS technique of estimate while working with secondary time series data spanning the years 1970 to 2003. It was found that structural adjustment programs had a negative influence on the volatility of currency rates, which in turn had a negative effect on foreign direct investment (FDI) inflows, although the actual influx of FDI had a positive connection to exchange rate volatility (i.e. the depreciation of the Naira).

The influence of macroeconomic determinants on foreign direct investment (FDI) inflows into Pakistan was investigated in this study (Hunjra et al., 2010). The Granger Causality test, descriptive statistics, and the Autoregressive Distributed-Layout (ADF) test for stationarity were used in the course of the studies that were carried out on the data gathered between the years 1992 and 2013. It was found that the rate of GDP growth and the interest rate in Nigeria had a considerable impact on the amount of money that came into the nation via Foreign Direct Investment, or FDI. It has been determined that changes in the value of currencies and rates of inflation have no impact on the total amount of capital obtained by FDI. The effect that changes in exchange rates have on the amount of foreign direct investment (FDI) coming into a number of East Asian countries is the subject of this research (Dhakal, et al., 2010).

These countries have been quite successful in enticing direct foreign investment, in spite of the periodic fluctuations that occur in their currencies. To this end, we apply an error correction model to yearly time series data from China (1982-2005), Indonesia (1981-2005), Malaysia (1974-2005), the Philippines (1977-2005), South Korea (1976-2005), and Thailand (1982-2005). In China, we use the years 1982-2005; in Indonesia, 1981-2005; in Malaysia, 1974-2005; in the Philippines, 1977-2005; and in Thailand, 1982-2005. (1975–2005). According to the findings of certain studies, the degree of volatility in the exchange rate of a country's currency may have an influence on whether or not it is successful in luring in foreign direct investment (FDI). Ellahi (2011) evaluated the impact that changes in currency rate had on foreign direct investment in Pakistan's economy using time series data spanning from 1980 to 2010.

In this investigation, we investigated the possibility of long-term relationships by using a multivariate VECM causality test. A model known as auto regressive distributed lag (ARDL) was used to both the long-term and short-term data in order to analyze them. It has been established that fluctuations in currency exchange rates have the effect of discouraging foreign direct investment over the long term. Analyzing the impact that changes in interest rates have on foreign direct investment in the Zimbabwean economy, Anna et al. (2012) make use of data obtained from the Reserve Bank of Zimbabwe, the reports of the International Monetary Fund, the reports of the World Bank, the Ministry of Finance, and Failed Nations. In order to make an accurate assessment of the situation, we resorted to the tried-and-true ordinary least squares approach of the linear regression model. It was discovered that changes in interest rates do not have a noticeable impact on FDI flows. Ullah et al. conduct an analysis on the impact that shifting exchange rates have on foreign direct investment (FDI) in Pakistan (2012). Between the years 1980 and 2010, time series data for foreign direct investment (FDI), currency rate, volatility, trade openness, inflation, and inflation rate were employed. They consider it relevant to the discussion and include it in their research since the exchange rate has been so volatile in recent times. Several distinct econometric methods, including the unit root test, volatility analysis, the co-integration technique, and causality analysis, were used throughout the course of the research project. According to the findings of the study, an unstable currency exchange rate is detrimental to foreign direct investment whereas a lower rupee is beneficial to attracting this kind of investment.

The freer movement of trade helps to stimulate foreign direct investment. According to the results of the Granger causality test, changes in the value of the currency exchange market are responsible for foreign direct investment (FDI), but not the other way around. Jin and Zang (2013) investigate how varying exchange rates effect foreign direct investment (FDI) by drawing from both international and domestic research. The model was validated with the help of two statistical tests: the OLS and the ADF. Additionally, the cointegration was analyzed with the help of the Engle-Granger causality test. In order to investigate the likelihood of cointegration between January 1997 and September 2012, monthly data on foreign direct investment (FDI) in China and the index of real effective exchange rate (REER) of RMB were used in both tests. This investigation covered the time period. According to the findings of the study, Foreign Direct Investment (FDI) in China grew as the value of

the RMB rose. When we talk about the fluctuation in the value of one currency in relation to another, we are talking to a phenomenon known as the volatility of exchange rates. Sometimes, this concept is also referred to as "volatility." Dealing in foreign currency may be profitable or unprofitable depending on a number of factors, one of which is the appreciation or depreciation of one currency relative to another.

The word "fluctuation" may be used to refer to a discourse about the depreciation or appreciation of a currency, and it can also be used to refer to the talk itself. The study that was conducted by is one of a number of important pieces of research that have considerably added to our general understanding of how changes in the value of certain currencies influence the economy as a whole (Haile & Pugh, 2013). Once the system of a fixed exchange rate was abandoned, there was a rise in the amount of foreign direct investment as well as other types of transactions using foreign currency; nonetheless, market stability remained a worry for those who were ready to ship their money abroad. Following the collapse of the system that maintained a fixed exchange rate, many other kinds of transactions using foreign currencies began to thrive (Chowdhury & Wheeler, 2008). International investors have a heightened awareness of the possibility of incurring a loss as a result of shifts in the value of the currency in which they have invested, which has led to an increase in the amount of information they try to get. This is due to the fact that ambiguity and unpredictability are necessary components of risks. "Foreign direct investment," abbreviated as "FDI," is when one invests money in a business that is physically based in a nation that is not their own with the intention of eventually gaining control of that company. This phrase was borrowed word for word from the World Bank. Equity capital, reinvestment of profits, other long-term capital, and short-term capital are the components that make up a nation's capital profile, which may be observed in the balance of payments. Short-term capital is also included.

According to the definitions of the International Monetary Fund (IMF) and the Organization for Economic Cooperation and Development (OECD), an individual, a corporation, a partnership, a government, a group of related individuals, or a group of related corporations and/or partnerships can all qualify as "direct investors." This, of course, depends on the location of the business. Additionally, a group of related individuals, corporations, and/or partnerships can be considered a group.

In addition, these organizations contend that a family or other kind of tightly linked group of individuals. Caves (1974) asserts that countries whose economy benefit from foreign direct investment (FDI) have a number of advantages. Just two examples of this are the sharing of technologies and methods of management that have shown to be effective, as well as access to production networks located all over the globe. One of the many benefits of foreign direct investment is that it may provide wealth, technical development, and educational opportunities to a country. This is only one of the many benefits of FDI. A nation can benefit from it in a variety of different ways, including the ability to invest in the improvement of its infrastructure, to redistribute surplus funds, to encourage the growth of its human resources, to finance the accumulation of capital to mitigate economic disequilibria, and to shield its citizens from both short-term and long-term economic downturns.

The examples shown above are only a few of the many ways that it might benefit a country.

Research conducted by Udomkergmogkol and Morrisey (2009) focused on monetary values as well as direct investments made by other countries. However, currency volatility seems to have the reverse impact, making it less likely that foreign direct investment will occur. The H-P filter approach is used whenever there is a need to do a volatility analysis. A rise in the real effective exchange rate is seen as devaluation and might delay investment from foreign direct sources. (Brzozowski, 2003) conducted research utilizing a Fixed Effects OLS and GMM Arellano-Bond model for 32 countries in order to investigate the impact that currency rate uncertainty has on foreign direct investment (FDI). The GARCH (1,1) method was used in order to get a reading on volatility, which research has proven to have a detrimental impact on FDI. Barrell et al. (2003) investigated how shifts in the value of the US dollar affected US foreign direct investment in Europe and the United Kingdom.

They did this by applying the generalized method of moments (GMM) to a panel of seven industries over the course of the study's time period, which ran from 1982 to 1998. They found a strong negative association between foreign direct investment from the United States and the volatility of exchange rates in Europe and the United Kingdom. In addition, research conducted by Gerardo & Felipe (2002) on the impact of exchange rate volatility among the G-3 on foreign direct investment discovered that a stable exchange rate is required in order to successfully attract FDI. In order to better understand the globe, we have segmented it into numerous regions

by using yearly statistics from 1975–1988. It was found that the volatility of currency exchange rates was negatively connected with foreign direct investment (FDI) into emerging countries.

According to, nations with differing degrees of openness have varied degrees of impact from currency fluctuations on foreign direct investment (FDI). Furceri and Borelli, (2008). Currency volatility encourages foreign direct investment in nations that have relatively lax policies regarding international capital flows, while it has the opposite effect on countries that welcome FDI with open arms. According to Bouoiyour and Rey (2005), who examined yearly data from 1960 to 2000, misalignments of the actual effective exchange rate and volatility, as represented by the standard deviation, had no effect on foreign direct investment (FDI) to Nigeria. This conclusion was reached after analyzing the data from 1960 to 2000. Tokunbo and Lloyd (2009) conducted an experiment in order to get a better understanding of how foreign direct investment (FDI) is affected by fluctuations in currency exchange rates. They uncovered a result that had a statistically significant bearing.

After using the methods of cointegration and error correction, we came to the conclusion that a rise in foreign direct investment was linked to a fall in the value of the currency of the destination. Even Nevertheless, the fact that there was not a significant shift in the standard deviation of exchange rates indicates that market volatility did not play a significant impact. According to Jie Qin's (2000) theoretical investigation of a specific sector within a bilateral economy, there is a positive association between fluctuations in currency exchange rates and bidirectional foreign direct investment (FDI) (FDI). As a direct consequence of changes in the value of the currency exchange rate, this study investigates the potential for risk diversification to be achieved via foreign direct investment (FDI) in both directions. The relationship between the prices of gold and oil, inflation, currency exchange rates, and stock market values has been the subject of investigation in a great number of research. On the other hand, the relationship between the nexus and monetary policy is not one that is often brought up when discussing either topic.

Because of the widespread perception that gold is a need, a certain amount of study has been done to investigate the relationship between the cost of gold and the cost of oil. Despite the inclusion of other macroeconomic elements such as stock indices (Lee & Lin, 2012) and currency rates, gold is still considered a need in these assessments. This is because gold is a scarce resource (Soytas et al. 2009) (Narayan et

al., (2010). To write: (Sari et al., 2010). The price of crude oil and gold have been studied extensively, and there is a clear correlation between the two markets, as shown by a meta-analysis of these studies (Ye, 2007; Zhang et al., 2007). Several studies have been conducted on the topic, two of which are Davidson et al. (2003) and (Gold's Correlation with the Stock and Currency Markets) all of which were published in 2003(Davidson, et al, 2003).

Both of these studies conduct an investigation on gold's use as a form of investment and savings (Capie et al., 2005; Sjaastad, 2008; Joy, 2011). Another aspect of gold's value that has garnered a lot of attention in academic literature is the precious metal's ability to act as a barrier or safe haven from the effects of fluctuating currency rates and inflation. When the value of an investment increases and decreases in parallel with the rate of inflation, we refer to that investment as a hedge against inflation (Dee et al., 2013). One further definition of a safe haven is an asset that, on average, has a positive correlation or is uncorrelated with the market but, at times of market stress and volatility, has a negative correlation or is uncorrelated (Baur & McDermott, 2010). A number of experts have conducted controlled experiments to investigate whether or not gold has the capacity to act as a hedge against economic instability or a safe haven. Due to the fact that the results are so diverse, it is difficult to draw any inferences from them.

Dee(2013) believe that even if gold may be a hedge against the danger of the stock market and inflation, it is still not a safe haven for Chinese investors. The findings of studies conducted by Beckmann et al. (2015). Beckmann and Czudaj (2013), Reboredo (2013) imply that investments in gold may be utilized as a hedge against market volatility for a broad range of assets and circumstances. The assumption that investors may find safety in the gold market during times of economic instability is supported by research (Baur & Lucey, 2010). According to Baur and McDermott (2010), the stock markets of major European nations and the United States are considered as a refuge of stability and a buffer against the risk of adverse economic outcomes. This is in contrast to the stock markets of countries such as Canada, Japan, Australia, and several nations that are still in the process of developing. The study's contradictory findings on the link between the nexus and its component pieces provide some evidence that it may manifest itself in somewhat different ways in each nation. There is no evidence that can be taken as definitive that these variables have a part in the choices made about monetary policy. In addition, there haven't been many studies

like this one done before on the economics of Pakistan, and this one helps fill that gap (Ahmed et al. 2016).

This article is an essential contribution to the body of literature since the studies that are offered here may assist the monetary policymakers in Pakistan in dealing with the economic instability that they face. This is the case due to the fact that the investigation itself took place in Pakistan. This research is also beneficial for anybody who is contemplating making an investment in the gold market in Pakistan. Because the value of gold often falls when there is an increase in the price of oil, the precious metal may be used as a hedge against inflation because of this relationship. Gold's price has a history of rising in tandem with a weakening in the value of the Saudi riyal, which makes gold an attractive potential hedge against the dollar. In spite of the relatively low price of gold in Saudi Arabia, there is still the possibility that investing in gold might be profitable in other countries. Gold is a strong hedge against inflation due to the fact that its price and the CPI tend to move in the same direction (upwards) (Mustapha et al., 2018).

According to the value analysis, risk-averse investors are prepared to pay a sizeable performance fee in order to convert from an investment portfolio based on gold to one based on bitcoin. This is despite the fact that bitcoin is now trading at a significant discount to gold. They have shown this by stating that they are willing to pay the expense. When taking into consideration the expenses associated with trade, these absolute outcomes were acceptable. If investors wish to increase their return on investment (ROI) while simultaneously lowering their risk, they can consider swapping some of their gold for bitcoin (Henriques & Sadorsky, 2018). In accordance with the State Bank of Pakistan Act, which was enacted in 1956, the State Bank of Pakistan (SBP) is tasked with formulating and executing the monetary policy of the nation. The core objectives of monetary policy are twofold: maintaining price stability while simultaneously supporting unrestricted and robust economic expansion. Before the 1990s, the emphasis was instead centered on exchange rate management, which significantly limited the SBP's ability to meet these aims. As a result, the SBP's capacity was severely curtailed. In the 1990s, the government's attempts to modernize the financial system were fruitful and met with widespread approval. Changing from the current system of monetary and credit management, which is run by the SBP, to one that is run by market forces In order for the SBP to better monitor the monetary

aggregates that are present in the economy, it has transitioned to a system of market-based monetary and credit management that is based on interest rates.

The targeted degree of monetary and credit growth was achieved by a combination of policy changes including adjustments to reserve requirements, control of interest rates, and open market operations (OMOs). Over the course of its existence, the SBP Act has been subjected to a number of amendments, all of which have been passed in order to confer more autonomy onto the bank. In 2001, SBP discontinued offering its clients the option of following guided credit objectives as a credit building strategy. Since 2006, the SBP has been maintaining a close watch on the rate of interest offered by the market for short-term money deposits. Since 2009, it has been considered normal for the overnight money market repo rate to fluctuate within the boundaries of the interest rate corridor that was previously agreed upon. In this tunnel, both the floor and the ceiling are present.

M2 growth was often used as a stand-in for overall prosperity for a considerable amount of time. The Federal Reserve has not taken any significant efforts, with the exception of a short time in 2010, to curb the expansion of the M2 money supply. Since 2009, the M0 target has been overtaken as the operational aim by the money market interest rate, which has now taken its place. This transition took place all the way back in 2009. The SBP has not defined any intermediate objectives for a notional anchor as of recent times. Instead, the SBP works to strike a balance between aggregate demand and available production in the short term. This method of conducting monetary policy may use tactics that are similar to those used for lowering inflation. After serving as the primary emphasis for a considerable amount of time, the balance of payments has been supplanted as the main priority of the SBP by inflation. It was decided not to discount the research papers that proposed a hypothesis on the factors that determine the currency exchange rate. There have been many different explanations and hypotheses put up as to why there is a currency exchange rate.

Several different schools of thought, such as the Portfolio Balance Theory (PBT), the Flexible Price Monetary Model (FPM), the Purchasing Power Parity (PPP), and the Sticky Price Monetary Model (SPM), may be grouped together under this category (PPP). Exchange rates have been shown to be significantly impacted by a number of factors, including aversion to risk, the current account, fiscal policy, and direct involvement of the government in the currency market (Branson and Kouri 1976). This procedure was carried out in accordance with the recommendations made

by the Portfolio Balance Model. Books that provide a more in-depth look at the ways in which varying interest rates effect various currencies. A new definition was developed in order to help people comprehend the relationship that exists between the interest rate and the currency exchange rate (Sargent and Wallace 1981). The authors Sargent and Wallace contend that a high level of interest rate policy might lead to an increase in inflation as well as a reduction in the demand for money.

They make this argument in their book. This is due to the fact that an increase in interest rates is a leading signal of a rise in the total amount of debt held by the government. As a direct result of the current scenario, the value of the currency will decrease. According to an idea that was presented by (Furman and Stiglit 1998), a future increase in interest rates might be detrimental to the performance of exports. As a direct result of this, the accumulation of foreign exchange reserves would slow down, which would contribute to the depreciation of the currency. At least three distinct theoretical models may potentially be used in order to make sense of the existing connection that exists between the interest rate and the exchange rate. According to the Purchasing Power Parity theory, the exchange rates of different nations should be established in such a way that the rates of inflation in each of those countries are approximately equivalent to one another (Yahya et al, 2011), and (Yaaba et al, 2012).

The second theory is referred to as the covered-and-uncovered interest rate parity hypothesis (CIRP and UIRP). Earlier versions of the CIRP model used the assumption that the rate of return on domestic and overseas financial investments were comparable to one another. On the other hand, the uncovered interest rate parity model might provide a different kind of explanation for the phenomenon in question. According to this model, the argument for a worldwide interest rate floor is weakened by the fact that there are regional disparities in the manufacturing of goods. It is generally accepted that an increase in the domestic or local rate of return in comparison to the global rate of return will result in an appreciation of the domestic currency in relation to other currencies in line with this theory. As a direct result of this, the nation's trade surplus and its edge over its competitors may both improve. The third school of thought, which is concerned with monetary policy, applies the demand and supply paradigm to modeling exchange rates. This view is based on supply and demand relationships (Vagiatzoglou et al. 2006). The link between the prices of currencies and the regimes that govern interest rates presents central bankers with a number of challenges. Several academic studies have been conducted to evaluate the

impact that different monetary policies have had on the values of a variety of currencies.

For example, Mundel (1973) identifies monetary policy and the exchange rate as two of the primary reasons for instability in nations that have not yet reached a high level of economic development. The study that Chete conducted in 1995 had the purpose of investigating the potential effects that a depreciation of the Nigerian currency may have on the country. His research was centered on the processes that lead to the formation of elasticity. The author of the paper believes that fluctuations in the value of the Nigerian naira over the course of the time period that was investigated may be explained by using models of trade flow and reserve levels. Ndung (1999) used the similar procedure to the real exchange rate in order to separate the cyclical and permanent components of it. The author draws the conclusion that the response of monetary policy is the source of the short-term fluctuations in the exchange rate, and that these changes have rebound effects on the money market. This conclusion is supported by the findings of a causality test that examines the relationships between several monetary policy variables and the real exchange rate.

The study conducted by Sanchez on the relationship between shifts in interest rates and shifts in currency exchange rates has been quoted several times (2005). The purpose of this study is to investigate the effect of currency rate passthrough on domestic pricing in the context of small open economies and to differentiate between contractionary and expansionary forms of currency depreciation. It was demonstrated that contractionary depreciations have a direct and positive association with interest rates, whereas expansionary depreciations have an indirect and negative association with interest rates; however, this association is only present when there is an unfavourable risk premium shock.

According to the findings of Chow and Kim (2004), the national currencies of these countries are more susceptible to fluctuations as a result of changes in exchange rates. In addition, the findings of the study demonstrated that the countries' more flexible currency exchange rates did not contribute to the preservation of interest rate stability. Research conducted by Wilson and Sheefeni (2014) found that there is a correlation between the interest rate in Namibia and the value of the Namibian currency. This link was found to be positive. The results of the investigation offered no evidence to support the hypothesis that the variables are cointegrated. According to research done by Simone and Razzak (1999), if the interest rate of one nation is

greater than that of another nation, the currency of the first nation will be worth more than the currency of the second nation. A different piece of study was conducted to explore the link between the Nigerian naira and the interest rate (Ezirim et al. 2012). We observed that the exchange rate was connected to the spiral of inflation both immediately and over the long run by using an autoregressive distributed lag approach. This relationship existed across the whole time period. Our findings were able to be validated as a direct consequence of this. As a result, the findings of the study led the researchers to the conclusion that the optimal tactic for targeting either inflation or the exchange rate entails mutual policies on both variables.

The history and origins of FDI theories

The history of direct investment from outside is shrouded in obscurity, and it is impossible to put together what happened. The phenomenon known as foreign direct investment (FDI) has been the subject of many different hypotheses, but there is as of yet no general agreement over which of these ideas is the most plausible or instructive. At the very least, the notion of foreign direct investment (FDI) has been explored since the early works of Smith (1776) as described in Smith, (1937) and Ricardo (1817), which were connected to the concept of the international specialization of industry. Smith, (1937) Adam Smith hypothesized that two nations would engage in commerce with one another if one of the nations could, with a fixed amount of investment in capital and labor, produce and ship more items than its closest competitor (absolute advantage). Smith's line of reasoning, on the other hand, was unable to explain why countries that were not both engaged in production yet traded with one another. In his books, David Ricardo (1817) established the idea of comparative advantage in order to explain FDI in a more understandable manner.

Ricardo was more concerned with the movement of components on a global scale, despite the fact that he felt that both labor and capital were movable inside a country. However, his theory was flawed due to the fact that it required the existence of two countries, two products, and complete mobility of all elements, all of which are unrealistic assumptions. In addition to this, he was unable to provide any explanation or justification for the circulation of money over the world. This runs counter to the prevalent belief that foreign direct investment (FDI) would be unnecessary in a society that is characterized by unrivaled levels of competitiveness (Kindleberger 1969). According to Denisia (2010), engaging in international commerce is the only viable

option to taking part in global markets if there are no barriers to either trade or competition on the global market. This environment inspired Hymer to hand in his thesis in 1960, which paved the path for future authors to present more compelling explanations for foreign direct investment (FDI) when it was cited in Hymer (1976). According to his point of view, foreign direct investment (FDI) is motivated by two factors: first, the desire of multinational corporations (MNCs) to maximize profits by capitalizing on competitive advantages; second, the need to limit or eliminate international competition. In his two-sector model of international capital flows, Mundell (1957) proposes the possibility that capital flows may supplant international commerce, which would result in a leveling of factor prices across nations. Mundell's model is based on the idea that capital flows may supplant international commerce. Mundell (1957) constructed a model with two countries, two items, two production variables, and two production functions that are otherwise comparable. This was done so that they could investigate the implications of Ricardo's theory of comparative advantage in more depth (Denisia, 2010). Although Mundell's strategy took into account worldwide portfolio assets, its primary emphasis was on short-term investments rather than foreign direct investment (FDI). Information collected in either the United States or Europe was often the primary source of inspiration for traditional beliefs. They said that nations attract foreign direct investment (FDI) when they have a comparative disadvantage in the production of a particular item, despite the fact that international commerce is predicated on nations' relative advantages in the production of goods.

Kojima and Ozawa (1984) improved the accuracy of Mundell's model by modifying it so that it could be used in the Japanese context. It is possible that Vernon Prenatt's product life cycle (PLC) concept helps to explain, at least in part, the postwar investment made by American companies in the countries of Western Europe between the years 1950 and 1970. This investment ranged from exporting to foreign direct investment. According to him, the production cycle of a corporation may be broken down into four separate stages: invention, growth, maturity, and decline. The development of not only the economy but also the level of technology served as the basis for the formation of this concept. As a result, the expansion of the economy determined the scale and nature of international trade, while advances in technology guaranteed the birth and development of a new product.

When a product is at the beginning stages of its life cycle, it is often only sold within the boundaries of the country where it was manufactured and is not exported. If there is a significant demand for a product, producers will churn out more units, exporters will push into new markets, and business will increase overall. These are the sorts of changes that mark the transition from infancy to adulthood. When the market for a product has reached its maturity and new rivals have entered the market, the firm that invented the product may commonly construct a factory in a new market in order to keep up with the expanding demand for their product. When goods are standardized, investments have the potential to be shifted to locations where they can be produced with the fewest possible input costs while still effectively competing with other businesses.

The PLC then repeats this cycle once again, this time with the introduction of yet another cutting-edge new product. This process is now being undertaken by the business in order to return back to growth, which demands innovation. The items are sent to the nation of origin of the innovation (which was once the exporter but is now the importer), and ultimately manufacturing in that nation is stopped (Nayak & Choudhury, 2014). In point of fact, this is what occurred when European businesses began duplicating American exports; as a result of this, American rivals established themselves in Europe in order to better compete in the American market (Denisia, 2010).

The "universal FDI theory," which makes an effort to explain the recent spike in the volume and complexity of FDI in global markets, draws on a broad variety of literature, ideas, and assumptions. Its goal is to provide light on why this surge occurred. Several works, such as Agarwal (1980), Calvet (1981), Helleiner (1989), Cantwell (1991), Meyer (1998), and Markusen (2002), as well as the more recent Faeth (2009) and Markusen (2012), present extensive analyses of theories and hypotheses connected to foreign direct investment (FDI) (Denisia 2009). This is only a tiny selection of the many different types of works that are considered to be part of this category (2010). When applied to the same foreign direct investment (FDI) modality, several theories and frameworks pertaining to foreign direct investment (FDI) may provide strikingly different sets of outcomes.

The macroeconomic approach, which places a higher priority on a nation's balance of payments, and the microeconomic view, which investigates the primary incentives for attracting foreign direct investment (FDI), are two examples of opposing points of

view. The macroeconomic approach prioritizes the nation's balance of payments. Both of these methods are used on a national or even a global scale, which is one way in which they are comparable to one another. The term "generic FDI theory" is used to refer to research that take a holistic approach to figuring out the reasons why investors choose to join a market in a certain manner.

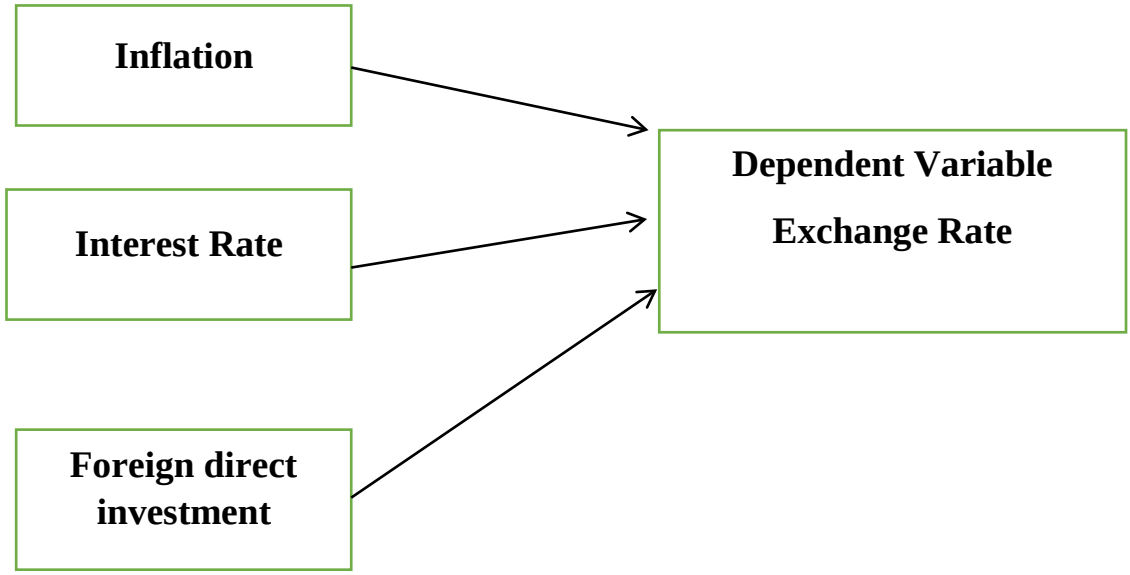
The phrase is used to denote the comprehensive body of study done on these topics. Because foreign direct investment (FDI) and other types of foreign investments are complex, it is difficult to reduce them all to a single phrase that can be used to build a comprehensive framework, strategy, or theory that is widely accepted and explains everything there is to know about FDI. One possible solution is to break down FDI into its component parts and explain each one individually. Having said that, it is possible that more recent and more established ideas have certain aspects in common (Agarwal 1980; Lizondo 1991; Dunning 2008; Vasyechko 2012). According to a taxonomy that is made available, FDI theory may be divided into a great number of distinct subfields (Faeth 2009). The following are some examples of specialized areas that are included under this overarching category: Theoretical Assistance for the Power of Monopolies (Hymer, 1960; Vernon, 1966), FDI in General, the OLI Paradigm, and the Theory of Substitutes (Mundell, 1968; Scaperland & Mauer, 1969). Kojima's complement theory was first released to the public in 1975 (Dunning, 1981), The proximity-concentration hypothesis and the factor-proportions hypothesis, which predict horizontal and vertical FDI, respectively, are grounded in the classical theory of multinational activity (Markusen, 1984; Helpman, 1984).

Policy factors as drivers of FDI; the theory of new economic geography (Krugman 1995); the diversified foreign direct investment theory; the knowledge capital model (Markusen, 1996; Markusen & Venables, 1998); theorizing from accretion and accumulation; and the (Bond & Samuelson, 1986; Black & Hoyt, 1989; Haufler & Wooton, 1999; Haaland & Wooton, 1999). Although there are a great number of other methods that may be used to explain FDI concepts, Agarwal's method and categorization seem to be the most well-liked among academics. This is despite the fact that there are a large number of different ways that can be used to describe FDI concepts. These approaches are broken down into two distinct categories, each of which is addressed in Moosa (2000), Dennisia (2005), and Denisia (2010). The best possible analysis of the market Theoretical frameworks that are predicated on the idea that markets are not flawless. Different interpretations on what constitutes a "perfect

market" The following is a list of the most prevalent ideas and concepts that provide accurate forecasts of market conditions: A) The Market-Size Hypothesis and Theory, B) The Diversification Hypothesis and Theory, and C) The Theory of Differentiating Rates of Return If you accept that there is no potential for harm, then the notion may be put into action. This theory asserts that domestic investments are on par with their international counterparts. Another point that has been brought up and is consistent with the fundamental assumption of this theory is the observation that countries experience both an inflow and an outflow of foreign direct investment (FDI) concurrently.

The primary assumption of the theory, which states that money flows from countries with low rates of return to those with higher rates of return, is in conflict with the current state of affairs regarding international trade, foreign direct investment stock, and foreign direct investment placement.

Conceptual Framework



Foreign Direct Investment and Exchange rate

"Foreign direct investment" (FDI) is the process by which money is brought into a country from outside of its boundaries. This process enables a pare company or multinational organization to maintain control over its subsidiaries located in other countries. In accordance with Goldberg et al. (2005). The practice of using money from another country, known as "foreign direct investment" (or "FDI"), to finance

local fixed assets such as offices, factories, and houses is what's meant to be referred to by this word. The value does not take into account any investments that were made directly on the stock market by foreign nationals. Because it is consistent and fruitful regardless of the state of the economy, foreign direct investment (FDI) is sometimes seen as being superior than equity investments in a nation's enterprises. This is because FDI comes from outside the country. According to the findings of Abbas et al. (2014), this is the case. In a similar vein, Huchet-Bourdon and Korinek (2011) claimed that foreign direct investment is very important for emerging nations.

If there is a clear path to long-term benefits for foreign investors operating in the production sector of the economy of the host nation, then there is a greater likelihood that such investors will deposit their money in the country in question. The most important factor to consider when it comes to the generation of brand-new capital is the presence of investments from other nations. However, foreign direct investment (FDI) is also essential in transferring cutting-edge technology and new, innovative ways of thinking from affluent countries to less developed countries throughout the world. Because the LDCs are in such desperate need of Foreign Direct Investments (FDI), they have begun offering financial incentives to countries that are serious about investing in their economy. This is because the FDI market is very competitive. In consideration of the assertion made by Loungani and Razin (2001). Foreign direct investment, often known as FDI, is a kind of private capital inflow that originates from outside of a nation. This type of investment entails both a long-term interest in and management of the business that is receiving the investment cash. The political atmosphere of a nation is another factor that could influence foreign direct investment (FDI). But only if the government of that nation makes it easier for businesses to compete in the global market and provide for its people, can foreign direct investment (FDI) help a country compete in the global economy and provide for its population.

As has been documented by Hassan and Mahmoo (2013). The rate at which the money of one nation may be exchanged for the currency of another nation is referred to as the "exchange rate," and this is the meaning of the word "exchange rate." The replacement of the currency of one nation with that of another. Swings in the exchange rate are primarily brought on by the response of the market to the many different conditions of currency supply and demand. The potential quantity of products that may be brought in and sent out of a country is directly impacted whenever there is uncertainty over the value of a particular currency pair. In accordance with Javed

and Farooq (2009), it is possible to quantify the production, imports, exports, reserves, and the overall value of the BOP. Currency exchange rates have an effect not only on the pricing of the goods that are exported and imported but also on the costs that are incurred in trying to maintain a positive balance of payment. When the exchange rate is in an investor's favor, investing in a foreign currency may be a terrific opportunity to create big gains for local investors. The difference between what the market is predicting and what the actual exchange rate is should be quite small in the perfect system.

According to one school of thought, the enormous potential for financial gain that exists as a result of the persistent shifts in the value of currency exchange rates (Javed & Farooq, 2009). According to research that was released by Harchaoui et al. (2005), changing the value of one currency in relation to another has contradictory effects on investment. There is a correlation between an increase in the value of the local currency and a rise in the marginal return on investment. This is due to the fact that an increase in sales in either domestic markets or international markets results in a greater marginal profit. This gain, on the other hand, is being eroded by the quickening development of variable expenditures as well as the rising cost of imported capital. There is no way to determine which impact is more significant in terms of the theoretical models since there is no way to compare them. Although the answer to this issue has not yet been determined via empirical research, Harchaoui et al. (2005) are the ones who are responsible for bringing up the subject of what role exchange rates play in investment in its whole.

There are primarily two methods to understand the value that is represented by money. When the currency of a nation is allowed to decline in value, prices of domestic goods fall while those of imported goods rise. This leads to an increase in domestic output and an improvement in the trade balance. The second effect is that consumers have less money available for spending as a direct consequence of the decline in the value of the currency. When a nation's currency and goods become less valuable, that nation's exports become more competitively priced, while its imports become more expensive. In 2014, this topic was covered by three different writers (Bilawal, Ibrahim, and Abba). It is a commonly held belief in the world of international business that the current state of currency exchange rates is one of the most important factors to consider when determining whether or not a company would engage in direct investment in a foreign country. This is due to the fact that a decline in the value of a

country's currency makes the assets of that nation more appealing to investors from other countries (Goldberg, et al,2005).

Recent research on the dynamics of currency rates and foreign direct investment (FDI) has evolved as a reaction to the deficiencies of the existing theoretical frameworks. This study has been conducted in response to the shortcomings of the established theoretical frameworks. Nevertheless, neither theoretical nor empirical research have arrived at a result that is universally accepted. Take, for instance, Lin et al. (2005). Goldberg, L., and Charles, K (2005) presented arguments that were very similar to these. They hypothesized that a decrease in the value of the currency of the destination market would encourage more multinational corporations to acquire assets in that region and boost the relative wealth of agents in source nations. Both of these are good alternatives to consider. Investors from the source country stand to gain when the currency of the destination country experiences a decrease in value since a greater proportion of their wealth is denominated in the source country's currency.

The cost of capital for these investors is brought down as a result of this. As a direct consequence of this development, investors may now make more aggressive bids on residential property located in foreign nations. In their analysis of foreign direct investment (FDI) flows into the United States from 1979 to 1991. The authors Klein, M., and E. Rosengren (1994) demonstrate that the relative wealth channel was more important than the relative wage channel in providing an explanation for these flows. The dropping value of a country's currency may be considered as a factor that favors foreign direct investment since it decreases the cost of producing things elsewhere. This is one of the reasons why China has become one of the world's largest manufacturers in recent years (Kohlhagen and Cushman 1985). We would like to offer acknowledgment to in acknowledgement of the efforts that they made to this post (Froot & Stein, 1991). An imperfect market model was developed in order to explain how a decline in the value of the domestic currency can induce local agents to purchase from sellers located in other countries.

Interest rate and Exchange rate

A ballpark figure for the cost of capital may be derived by utilizing the interest rate (INT). The neoclassical hypothesis states that as interest rates are raised, the cost of capital also rises, and as a result, individuals save less money since it becomes more

expensive for them to do so. When interest rates fall, the cost of capital falls along with them, and as a result, businesses have a tendency to spend more money. Because it boosts the return on investment (also known as "profit") that can be achieved by holding money anywhere, even in the country that is receiving the investment, a fall in the average global interest rate makes foreign direct investment more appealing. When making investments overseas, it is essential to take into account both the local interest rate as well as the international interest rate (sometimes referred to as the source-country rate) (REALINT). It is logical to expect that the international interest rate, which reflects the cost of financing to foreign investors, will have a discouraging effect on FDI. This is because the international interest rate reflects the cost of financing to foreign investors (FDI). Since the real domestic interest rate is a solid indication of the rate of return on investment in a country, it is expected that nations with high real domestic interest rates would see an increase in foreign direct investment (FDI). It is anticipated that there would be a growth in foreign direct investment as a consequence of the country's improved infrastructure (as measured by the number of telephones per 1,000 people).

One of the most accurate indicators of future economic expansion is the amount of credit that is extended inside a country's borders to the private sector (DOMCRGDP). It is anticipated that there would have a positive impact on FDI. The Government Final Consumption Expenditure (GCON), which acts as a proxy for the size of the government, is anticipated to expand.

Inflation and Exchange rate

This article examines the impact that Nigeria's currency volatility and inflationary uncertainties had on foreign direct investment (FDI) between the years 1970 and 2005. The years 1970 through 2005 are going to be the primary emphasis of this study. The GARCH model was used to do calculations on the volatility of exchange rates and inflation uncertainty. The results revealed that exchange rate volatility was more persistent over time. The anticipated effects of shifts in currency value and inflation rate contributed to a reduction in the amount of money being invested directly from outside. In light of these findings, it should come as no surprise that the authorities in Nigeria should work toward achieving exchange rate stability and macroeconomic stability in order to attract a greater amount of FDI. The next five sections of this article each cover one of these topics in more depth than the previous

section. In the next paragraph, we will talk about foreign direct investment in Nigeria, often known as FDI for short. This issue will be discussed in the following part. The literature review on the factors that influence foreign direct investment (FDI) is presented in Section III, and the model itself is described in Section IV. In this section, we will talk about the factors that have an effect on FDI.

A discussion of the empirical data is presented in Part V of this research, and a summary along with some concluding remarks are included in Part VI. The Granger Causality test is used to the assessment of the data after it has been processed. According to the findings of the study, fluctuations in the exchange rate have a direct impact on the total amount of foreign direct investment (FDI) pouring into Nigeria; however there is no association between inflation and FDI.

CHAPTER III

Data and Methodology

Introduction

This area of our study or research will cover different procedures, processes involved, or actions that are implemented in order to obtain crucial informational data for the study are spoken about in full length and consideration, using econometric guidelines. The regressor and regressands that were used in running the regression in this research are also talked about and how and where they were obtained. This part also looks at and discusses the various statistical approaches that were utilized to examine the data gathered during this research.

Data

The World Bank Data Site provided us with the secondary data we needed for our investigation. We used data from 1981 to 2020 to conduct our study. The bulk of research projects rely on two sorts of data to get at their ultimate conclusions: theoretical knowledge and data analysis, which is often employed to arrive at those conclusions. The author of this study used the same procedure as the author of the previous study. To get quantitative data for a broad variety of components and elements, the World Bank Data Center must be used as a resource. The information gathered will be used to evaluate the relationship between foreign direct investment and exchange rate in Nigeria.

Study's Variables

Real exchange rate

The real effective exchange rate is the nominal effective exchange rate less the price deflator or cost index. This shows the effective exchange rate. The real effective exchange rate is the nominal effective exchange rate adjusted for relative price or cost changes in the home country, chosen foreign nations, and the euro region. Real effective exchange rate is a nominal effective exchange rate index. The nominal effective exchange rate index is the ratio (stated on a base of 2010 = 100) of a currency's period-average exchange rate and a weighted geometric average of exchange rates for chosen nations and the euro area. This ratio is based on 2010.This index is used to measure the effectiveness of exchange rates. The majority of the weights that are assigned to high-income countries derive from the trade of

manufactured goods that occurs between industrialized countries. In order to create these data, we made use of both the nominal effective exchange rate index as well as a cost indicator of relative normalized unit labor costs in manufacturing. The nominal effective exchange rate index for selected other countries is determined based on trade in manufactured products and the primary product with nations that are either partners or competitors. If the real effective exchange rate index goes up, it indicates that the value of the local currency is growing in comparison to the nominal index for these nations. In a market economy, the relative pricing of goods and services, such as the real exchange rate, real wages, and real interest rates, all have an effect on the resource allocation decisions made by households, producers, and governments. They play a vital part in deciding how much each item will cost in comparison to the others. As a consequence of this, comparable pricing provide vital information on how different economic entities cooperate or compete inside the confines of a particular nation as well as across international boundaries. Changes in real effective exchange rates should be viewed with care because of the conceptual and empirical constraints that exist in this area.

Foreign direct investment (inflow):

What we refer to as "foreign direct investment" (or "FDI") is money that is brought in from outside the nation with the intention of purchasing a controlling position (defined as 10 percent or more of the voting shares) in a company that is based in a country in which the investors do not have a nationality or residency. In the context of the balance of payments, it refers to the aggregate of equity capital, reinvestment of profits, other long-term capital, and short-term capital. This indicator calculates the percentage of a country's GDP that was contributed by direct investments from other countries in the nation that is providing the data. If an investor holds a significant stake in a company that is headquartered in a country that has a different economy than the investor's own, then the investor's balance of payments will include information on the firm's equity flows. A significant stake is defined as 10% or more of the voting shares in the company. In the context of the balance of payments, it refers to the aggregate of equity capital, reinvestment of profits, other long-term capital, and short-term capital. The percentage of a country's gross domestic product (GDP) that corresponds to the net amount of investment money brought in by investors from other countries.

The statistics that we get on equity flows mostly come from the information that is included in the balance of payments. Estimates of foreign direct investment (FDI) flows made by World Bank personnel are based on data obtained from the United Nations Conference on Trade and Development (UNCTAD) and other official national sources. A definition of foreign direct investment that is generally recognized all over the globe was included in the sixth edition of the Balance of Payments Manual that was released by the International Monetary Fund in 2009. According to this definition, foreign direct investment includes the following categories of investments: equity investments (including equity-linked investments that give rise to control or influence), investments in enterprises that are indirectly influenced or controlled, investments in fellow enterprises, debt (except for certain types of debt), and investments in industries that are not the investor's core business.

The Framework for Direct Investment Relationships includes control- and influence-based criteria that may be used to determine whether or not a cross-border ownership arrangement does in fact represent a direct investment link. An investment strategy with the long-term objective of gaining a major ownership stake in or strong operational control of an organization based outside of the investor's native country is known as foreign direct investment (FDI). Whether for the sake of production or storage, establishing operations in a foreign nation is often seen as a kind of investment with a perspective that is focused on the long term. Joint ventures involve the investor forming a business partnership with a foreign company; greenfield investments involve the investor setting up shop in a foreign country by building brand-new production facilities; mergers and acquisitions involve the investor purchasing an already established business overseas; greenfield investments are also known as greenfield investments. In order to be legal, foreign direct investment (FDI) must account for at least 10% of a company's voting stock, as specified by the rules of the IMF. In actuality, though, the criteria in some other nations are more stringent. Despite the fact that the definition of long-term loans varies from nation to nation, a significant number of nations fail to take into consideration reinvestment earnings. Balance of Payments is shortened to "Bop" in many financial circles.

Data on a nation's foreign direct investment does not reflect the complete picture of that nation's involvement in international investment. Although a large number of developing nations get the majority of their investment capital from sources inside their own country, this source of investment funding is not reflected in the data that is

collected for foreign direct investment (FDI). Statistics on foreign direct investment (FDI) do not include in their tally cross-border transactions that do not include an equity investment. The World Bank reports one number for the total amount of worldwide private financial flows, but other sources report a different number. This discrepancy can be attributed to differences in the data collection methods, economic classifications, as well as the data modification and disaggregation procedures. In the case of debt financing in particular, contradictions may also arise as a result of the manner in which certain installments of the transactions and some offshore issuances are considered. The data on equity flows include any nation for which it is at all feasible to get statistics.

INFLATION

The yearly rate of growth in the GDP implicit deflator is a measure of inflation that is indicative of the pace of general price rises in the economy. Inflation is measured as the percentage increase in the GDP implicit deflator from the previous year. This rate of inflation is determined on a yearly basis. These separate data sets have been combined into a single, continuous dataset using integration software. This was done to ensure that there would be no breakdowns in continuity as a consequence of the changing time periods, data sources, or study designs that were being investigated.

Because of this, it is possible that it cannot be compared to any of the other historical national accounts datasets that are included inside the database. In order to guarantee the precision of the estimates used in national accounts and to make it possible for those estimates to be compared to statistics from other countries, the data pertaining to GDP and its constituent parts need to be examined on a regular basis. The GDP estimates are revised on a weekly, quarterly, or yearly basis in certain nations, while in others, the frequency of revisions is far lower than in those countries. Modifications are often unobtrusive and performed periodically throughout the year in response to newly uncovered information. On the other hand, in order to rebase the national accounts and include newly found methods and data sources, it is necessary to make significant revisions on a regular basis. As a consequence of improvements in data sources, comprehensive revisions of GDP statistics typically (but not always) result in significant changes to GDP and other relevant aggregates. This is due to the fact that the revised statistics cover a wider area of the economy. Having said that, there are

times when this is not the case. If more variables are taken into account, it's possible that growth predictions for the gross domestic product may shift. In the event that these adjustments are not made consistently to the historical data, the series will include missing values. By connecting the old and new series via the use of historical growth rates, it is occasionally possible to eliminate the disruption in constant price series that is brought on by rebasing. At long last, we have a complete and consistent time series of inflation figures that are based on the GDP deflator. For the purpose of determining the rate of inflation in the implicit GDP deflator, data from both the WDI Archive and the IMF WEO Statistics were used. It is not possible to do a comparison between the linked-years series and the other national accounts series included inside the database since access to the World Bank's databases is restricted to its member nations only.
Real interest rate: To calculate the real interest rate, one must first take the nominal interest rate on loans and deduct the rate of inflation from that number. The GDP deflator is what was used in the calculation of this inflation rate. Although it is possible to compare loan rates across nations, doing so is made more difficult by the fact that every nation has its own own characteristics and circumstances. The interest rate may fluctuate dramatically even within the same economy if there is sufficient market competition, if there are many laws that control loans and deposits, and if the power dynamic that exists between creditors and borrowers is not consistent. The level of interest rates in these economies is determined by laws or orders issued by the executive branch. It may be difficult to gather interest rate statistics that are indicative of market transactions in countries that have imperfect markets or in which the nominal rates reported do not reflect the effective rates. This may be the case in countries where both of these conditions exist. It's possible that this is the situation in certain nations.

The International Monetary Fund utilizes information on deposits and loans in order to arrive at an estimate of the average interest rate that local banks charge their respective clients. However, because to the vast variety of circumstances under which interest rates are made public, it is difficult to make meaningful comparisons between the interest rates of other nations. Before we can calculate real interest rates, we need to first apply a downward adjustment to nominal interest rates because of an estimate of the inflation rate in the economy. This adjustment allows us to compute real interest rates. In the event that the real interest rate is negative, the buying power of the principle will decline correspondingly. The formula for calculating real interest rates

is stated as (I + P) / (1 + P), where I and P stand for the actual interest rate and the nominal interest rate, respectively. Real interest rates are calculated by subtracting the inflation rate from the nominal interest rate (as measured by the GDP deflator). Countries that had been reporting data in line with the IMF's Monetary and Financial Statistical Manual from the year 2000 were provided with an updated version of the statistics beginning in the year 2009, and this continued through 2009. If a nation satisfies the criteria that the IFS has established for the supply of data, then the format in which that nation's data is provided will remain consistent at all times. The local net credit and the global net assets of a bank are both considered to be its assets. In addition to obtaining credit for its own purposes, the non-financial public sector receives credit via investments in short-term and long-term government securities as well as loans to state firms.

Because of this, the definition of net domestic credit includes the public sector outside of finance. Banks' obligations to private entities and public authorities serve as a counterweight to their customer deposits. "Net domestic credit" refers to the sum of money that households and companies owe to domestic financial institutions like banks and non-banks. The major method for regulating monetary base swings is domestic credit. There are several situations when central bank loans to the government are crucial. The cost of central bank refinancing facilities, shifts in market interest rates due to open market operations, shifts in reserve requirements placed on banks, and credit restrictions supplied by banks are all examples of how the central bank may control lending to the private sector. Capital flight, the business cycle, and economic bubbles are only some of the events that the real interest rate is used to explain within the context of various economic theories. All else being equal, the real interest rate or the demand for loans will cause a diversion of resources from consumption to savings. There will be a shift in demand away from savings and toward investment and spending when real interest rates are low.

Variables	**Abb**	**Measurement Unit**	**Source**
Real Exchange Rate	REX	Index(2010=100)	World Bank Development Indicator
Inflation	INF	GDP deflator (annual %)	World Bank Development Indicator
Foreign Direct Investment	FDI	Net Inflows(% of GDP)	World Bank Development Indicator
Real Interest Rate	RINT	Percentage(%)	World Bank Development Indicator

Model specification

When we talk about "model specification," we're referring to the process of selecting the independent variables for inclusion in or exclusion from a regression model. This is the part of the process that gives the model its name. When trying to define a regression model, it is best to use theoretical criteria rather than empirical or practical ones. In the fields of regression analysis and econometrics, the term "specification" refers to the processes that are carried out in order to convert a theory into a regression model. It is essential to the success of this method that the suitable functional form and collection of variables be chosen.

Based on what has been said up to this point,

In order to understand the nature of Nigeria's currency's long-term link with international commerce, several modeling approaches, including co-integration and error-correction modeling, were used. These are the detailed models that have been updated:

$$REER_t = \beta 0 + \beta 1\ FDI_t + \beta 2 RIR_t + \beta 3 INF_t + \mu t \qquad (1)$$

REER is the real effective exchange rate and is the dependent variable; and independent variables are:

FDI which is the foreign direct investment inflow % of GDP

INF it stands for inflation

RIR is the abbreviation of real interest rate

μ is the representation of the errors term and t is the research time period.

Descriptive Statistics

Descriptive statistics are concise and informative coefficients that define a data collection, which may be a representative sample or a comprehensive representation of a population. Descriptive statistics are used to describe a variety of topics, including people, places, and things. It is also feasible to use descriptive statistics in order to describe the whole population. Similar ideas, "descriptive data" and "descriptive

indices," are synonyms for "descriptive statistics." Statistics that describe things also go by the names "descriptive data" and "descriptive indices," amongst a number of other names. The subcategories of descriptive statistics known as measures of central tendency and measures of variability stand out as being particularly important (spread). Quantifying variability may be done in a number of different methods, some of which include calculating the standard deviation, variance, minimum and maximum variables, kurtosis, and skewness. In the field of statistics, the term "descriptive statistics" refers to the use of concise yet informative coefficients to characterize a data collection. This data collection may be a representation of the whole population or only a portion of it. Another potential alternative is to make use of descriptive statistics in order to shed light on the general population as a whole. The mean, the median, and the mode are all excellent examples of metrics that may be used to determine the central tendency of data. Quantifying variability may be done using a number of different methods, including the standard deviation, variance, minimum and maximum variables, kurtosis, and skewness. Measures of central tendency may be distinguished from measures of variability rather easily within descriptive statistics due to the existence of a distinct boundary between the two (spread). Metrics such as the mean, median, and mode focus on the point in the data set that is exactly in the middle. The standard deviation, the variance, the kurtosis, and the skewness are all indicators of dispersion. Additional indications include the value at its minimum and its highest.

In a word, descriptive statistics are condensed summaries of samples and measurements that assist in identifying and explaining the features of a data collection. This is done so that the statistics may be utilized in a manner that is more convenient. The mean, the median, and the mode are three of the most well-known examples of descriptive statistics. Another example is the standard deviation. These statistics are also often used in almost every mathematics and statistics curriculum across all educational levels. The Unicorn among Men, Adam Hayes (2022)

If we have access to this data, it's possible that growth in the stock market is connected with more foreign direct investment.

Stationarity test

We say that a time series is stationary when both the mean and the variance of the series stay the same over the whole of the series' time period. If the data shows either a pattern or seasonality, then it cannot be deemed stationary since it satisfies

both parties' requirements for such characteristics. The concept of stationarity is very important to the field of time series analysis. An earlier post I made on this subject of my blog gives an introduction that is not only brief but also comprehensive to the problem at hand and the reasons why it is so important. The absence of change in the statistical properties of a time series, or more specifically in the process that develops those qualities, over the course of the lifetime of the time series, is what is meant by the term "stationarity." This is because stationarity is defined as the absence of change in the statistical properties of a time series. It is essential to have a solid comprehension of stationarity since this concept serves as the foundation for a wide variety of insightful analytical procedures, statistical tests, and modeling methodologies. Because of this, it is very important to have the capability of determining whether or not a time series is stationary. This simply means that one does not have to pick between two options that cannot coexist, but rather one must determine with a high degree of certainty that a series is produced by a process that is stationary. A unit root test is something statisticians will do if they have reason to believe a time series variable is not stationary and does in fact have a unit root. It is common practice to refer to the presence of a unit root as the null hypothesis. Depending on the kind of test that is carried out, the alternative hypothesis may be characterized as stationarity, trend stationarity, or an explosive root when contrasted with the null hypothesis of no change, which states that there would be no change.

ADF Unit root test

The Augmented Dickey-Fuller test, sometimes known as the ADF test, is a well-known statistical approach that may be used to determine whether or not a certain time series is stationary. When seeking to assess whether or not a certain time series is really stationary, one of the numerous statistical tests that are available, known as the stationary test, is the one that is most usually utilized. The study of time series is highly reliant on data that is stationary. When attempting to generate a prediction based on an ARIMA time series, the first step is to determine how much modification is required to make the series stationary. This is very important information in light of the fact that the model does not accurately predict nonstationary time series data. Let's make the effort required to completely understand the dynamics of the current situation. Initially, the Augmented Dickey-Fuller approach was used in order to investigate the time series components of the data (ADF). The "unit root test" is the

method to follow if you are interested in finding out whether or not the data you have are stationary. The null hypothesis, which states that a series is not stable, is compared with the alternative hypothesis, which states that there is no unit root. This technique to data analysis is known as the ADF approach (stationary).

ARDL Model

The term "autoregressive-distributed lag" is most often abbreviated as "ARDL" in the academic community. Even though this kind of regression model has been available for some time, it was only recently shown to be a very helpful instrument for determining if there are long-run links between economic time series. Economists have, for a significant amount of time, depended on the autoregressive distributed lag (ARDL) model to characterize the connection between a variety of economic variables by using a single equation time series structure. This structure is used to create time series. The '70s were the decade in which this type was first developed. Because the cointegration of nonstationary variables is similar to an EC process, it seems as if the EC process is equivalent to the reparameterization of the ARDL model Engle and (Granger 1987); (Hassler & Wolters 2006).

By making use of the EC representation, one is able to determine whether or not a long-run or cointegrating link is present in the system. The method of limit testing is a strategy that enables one to arrive at a definitive verdict without being aware of whether the variables are integrated in order zero (I (0)) or order one (I (1)). Pesaran et al, (2001). The ARDL/EC model is able to provide accurate projections for both the short-term and the long-term dynamics, while also being able to differentiate between the two. The ARDL test has a lot of advantages, one of which is that it can process more information without negatively affecting its performance, and because of these advantages, it works very well for our research.

Residual diagnostic and stability tests

The Breusch-Godfrey serial correlation LM test investigates the possibility of autocorrelation in the regression model errors. During a regression analysis, it determines a test statistic by computing it with the help of the residuals from the model that is being considered. As far as the null hypothesis is concerned, there is no evidence of a sequential connection up to rank p. Autoregressive conditional heteroskedasticity (ARDL) models are used to depict time-varying financial time series such as stock

prices. These models account for the passage of time. The ARDL models include the presumption that the variability of the present error term is proportional to the severity of the errors that have been made in the past. As a direct consequence of this, volatility increases. Normality tests are performed in order to determine whether or not a given collection of data can be adequately modeled by a normal distribution or whether or not a random variable that is connected to the collection of data is likewise normally distributed. The occurrence of parameter instability in nonlinear models is not as common as one may think (Saliminezhad et al. 2018). As a direct result of this, the stability of the estimated model that was used has to be analysed in order to determine whether or not the conclusions can be trusted. In order to do this, we make use of the CUSUM of Squares Test developed by Brown and his (colleagues 1975). During the whole process of estimating, the stability of the model has to be maintained at all times; the degree of trust placed in the post-estimation test will determine how important this is (Hansen, 2000).

The dependability of the coefficients is investigated by the use of CUSMUS tests, which are performed in multiple linear regression analysis. Recursive residuals, also known as standardized one-step-ahead prediction errors, are created regularly from nested subsamples of data and used in inference as sums or sums of squares of residuals. Another name for recursive residuals is standardized one-step-ahead prediction errors. The presence of outliers in the sequence's anticipated range is evidence that the sequence's fundamental structure has evolved throughout the course of its existence. This is the case despite the fact that the null hypothesis indicates there would be no change in the parameters. We make use of the Cusum tests in order to determine whether or not the coefficients in a multiple linear regression model of the form $y = X +$ are consistent with one another. The inference is based on the accumulative or squared sums of recursive residuals, which are generated in an iterative method. Those sums are used to determine the residuals (standardized one-step-ahead prediction errors). It is evidence against the coefficient stability null hypothesis if a series of values deviates from a specified range. This hypothesis asserts that the structure of the model has not changed over the course of time. It's possible that this will occur if the values are too high.

Granger Causality Analysis

The concept of G-causality is effective in forecasting the consequences of causes since it is based on the basic notion that causes exist before their effects and that those causes may be foreseen. Since Norbert Wiener proposed the concept, it has been implemented in the form of linear vector autoregressive (VAR) models of random time series data by econometrician Clive Granger (Granger, 1969), with significant expansions made by John Geweke and others in the following decades (Geweke, 1982). Almost all regression models (VARs) are simple mathematical models that explain the value of a variable at any given point in time as a (linear) weighted total amount of the data point in the past (typically across a number of discrete time steps) and the value of a group of additional variables in the past. Vector random processes, a kind of random process, are used to store time series in each variable. Each process is represented by a different kind of variable. Before trying to fit a VAR model successfully, it is vital to determine the appropriate weights to apply in order to reduce estimate mistakes.

There are many common approaches to this. A variable X is said to be "G-caused" by a variable Y if its past includes information that assists in the prediction of Y's future, in addition to whatever information already exists in Y's past (and the pasts of any other "conditioned" variables Z) at the time of Y's occurrence. The existence of "information flow" from X to Y between the two locations in a particular circumstance may be characterized as the attainment of this aim. As a consequence, Barnett et al. (2009) suggest that using G-causality, which is an estimate of the amount of entropy conveyed, is fair. In this application, a guided version of Shannon's similarity measure is employed. Shannon's similarity is a method for determining how statistically linked two variables are or how much information they share.

CHAPTER FOUR
PRESENTATION OF RESULT AND INTERPRETATION

The presentation and interpretation of the findings of the empirical study of the model that was employed in this inquiry is a significant portion of the primary focus of this chapter. After the variables have been analyzed for their descriptive statistics, the next step is to determine how well they correlate with one another. The outcomes of the test to determine the unit root are provided in Section 4. Once the sequence of integration was determined, the Johansen cointegration test was carried out so that researchers could examine the possibility of a long-term connection existing between the variables. In Section 5, the findings and interpretations of the cointegration test are laid forth for readers. The purpose of the Engle-Granger Pair-wise Causation Test, which is discussed in Section 6 of this chapter, is to assess whether or not there is a direction of causation between the regressed and the regressor(s) in the model. In Chapter 3, the Error Correction Model estimate that was used in the research is provided, and the results are analyzed in light of the predictions that were made by the model.

Descriptive Statistics

When we first started looking at the data, the first thing we did was offer some descriptive statistics for the various variables that were needed to understand the dynamic nexus and the influence of exchange rate on FDI in Nigeria. If we make use of descriptive statistics, we may be able to gain a quick notion as to whether or not the probability distribution for the time series data is normal. Table 4.1 provides some descriptive data for each variable that may be seen below.

Table 1

	REX	**FDI**	**INF**	**RINT**
Mean	147.9720	1.500125	21.67358	0.434224
Median	100.5465	1.126314	10.75185	4.326392
Maximum	538.8903	5.790847	219.0028	18.18000
Manimum	49.74471	0.195183	0.686099	-65.85715

Std.Dev	117.1855	1.245262	35.11185	14.44028
Skewness	1.905583	1.722291	4.680593	-2.680369
Kurtosis	5.839433	6.023093	26.41185	12.58348
Jarque-bera **Probability**	37.64566 0.0000	35.00706 0.0000	1059.577 0.0000	200.96676 0.0000
Sum **Sum sq.Dev**	5918.882 535564.9	60.00501 60.47639	866.9432 48081.03	17.36898 8132.346
Observations	40	40	40	40

Source: Author's Computation

The factors that were taken into consideration for this study can be found listed in the table that came before it, along with a description of the traits and qualities that each variable has. The mean is the measure of central tendency, and it may be used to define the average of the variables that were utilized in the series. The following are the average values derived from the distribution: (147.9720), (1.500125), (21.67358), and Real exchange rate, FDI, inflation, and real interest rate (0.434224). The data set reveals that the real exchange rate is the series with the greatest point value, while the interest rate is the series with the lowest point value. On the other hand, the standard deviation is a measure of dispersion that reveals the degree to which data deviate from the mean. It is often used in statistical analysis. The standard deviations for the variables that were used in the study are also included in the table and they are as follows: REX (117.1855), FDI (1.500125), INF (21.67358), and RINT (0.434224). The skewness normality measure, on the other hand, does take into consideration the degree to which the series is asymmetric. The real interest rate is notably skewed to the left, in contrast to the majority of the other variables, which are positively slanted to the right. The kurtosis is another measure of normality that indicates the peakiness or flatness of the distribution in the series. It may be positive or negative. The values of all of the variables have been determined to have leptokurtic distributions, which indicates that they are more likely to be higher than the sample mean. The table reveals, as a conclusion, that there are forty distinct combinations of the number of observations.

Unit Root Test (ADF) Result

In order to prove their theory, Dickey and Fuller (1979) developed a computer program. This software examines a given variable and evaluates whether or not it demonstrates an a priori random walk or a unit root. Any one of these situations is suitable for doing an analysis with the help of the software. According to Hamilton, the extended Dickey-Fuller test has four different applications that it may be used for (1994). It is necessary that there be precisely one unit root for each and every sample taken from a random variable. This stays true regardless of the specifics of the situation. When a consideration of motion is included to the regression that is utilized in the null hypothesis and in the second procedure, there is a considerable difference between the two approaches. Before selecting whether or not to include a drift component in the null hypothesis, it is necessary to give careful consideration to the aforementioned two aspects. The Dickey-Fuller test is quite similar to the one that we have just examined; the main difference is that it is carried out on the model itself.

Table2

Variable	ADF				PP			
	Intercept		Decision		Intercept		Trend and Intercept	
	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.
REX	0.2501	0.0016	I(1)	0.0087	0.2954	0.0019	0.5774	0.0001
FDI	0.0055	0.0001	I(0)	0.0005	0.0066	0.0000	0.0345	0.0000
RINT	0.0000	0.0055	I(0)	0.0326	0.0000	0.0001	0.0000	0.0000
INF	0.0000	0.0000	I(0)	0.0000	0.0000	0.0001	0.0000	0.0000

Source: Author's Computation

The researcher checked to see whether the dataset had any stationary values before proceeding with an otherwise pointless regression. For the purpose of determining whether or not the model's input variables are stationary, the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests are carried out (PP). The ADF test provides evidence that REX is stationary at a level, but this finding is only significant

at the 10% level, while the ADF test provides evidence that the real interest rate is steady at all of the standard significance levels. In addition to this, the significance level for the inflation rate is at 5%, where it remains steady. According to the results of the ADF test, the other two variables are stable with respect to the initial difference. In a similar fashion, the Phillips-Perron test indicates that RINT is stationary at all conventional levels of significance, but REX is stationary only at the 5% significance level. In the end, the researcher used the Phillips-perron test, which demonstrated that the three variables that remained unchanged were consistent across all of the conventional significant criteria. The fact that the statistical features of the distribution, such as its mean, variance, and covariance over time, do not change throughout the course of time enables us to conclude with complete certainty that the series used in this model are stable.

ARDL Bound Test

It is necessary that one of the two processes be accountable for the production of the time series data. In order to demonstrate how important delayed values of variables are in a one-variable equilibrium correction system, an example of an ARDL model that is termed stationary, bound testing is used. According to Haug (2002), the ARDL approach, which is used for bounds testing, has been shown to function just as well with less samples. This was shown by the fact that it was shown to perform just as well. In order to achieve the highest possible level of accuracy, it is necessary to concurrently estimate both the short-run and the long-run parameters in the short run. The following illustration illustrates one potential link between economic growth and the use of loans from other countries:

Table 3

Test statistics	**Value**	**Significant level**	**I(0)**	**I(1)**
F-Statistics	49.13571	10%	3.47	4.45
K	3	5%	4.01	5.07
		2.5%	4.52	5.62

Source: Author's Computation

We reject the null hypothesis and accept the alternative hypothesis that the series does have a long-run connection, which further implies that the variables used by the researcher in this study were co-integrated. This is because the critical values of the F

statistic in Table4. 3 are larger than the asymptotic upper limit. This means that the null hypothesis is rejected and the alternative hypothesis is accepted. According to the findings of the study, this hints that there is substantial evidence of a link between the series over a longer period of time.

(ARDL) Long-run Test

Table 4

Variables	Coefficients	Std.error	P-value
FDI	-7.972177	2.228236	0.0034
INF	3.029611	0.826882	0.0029
RINT	3.856921	1.159217	0.0014

Source: Author's Computation

If one believes that all other factors will stay the same, the long-term statistics shown in the table above demonstrate that the money supply coefficient is statistically positive and significantly different from zero (the ceteris paribus assumption). This indicates that there will be a boost of 0.696886 percent to the overall rate of economic growth for every one percent rise in the money supply. In a similar vein, a rise of one percent in exchange rates will lead to an increase of 0.02% in economic growth, provided that all other factors stay same (this is because the exchange rate coefficient is positive and statistically significant). An increase in inflation of one percent has a depressing and statistically significant impact on economic growth of 0.15%. This is the case even when all other variables are maintained constant. Assuming that all other conditions stay the same, each percentage point increase in the real interest rate results in a 0.0072% increase in economic growth. Inflation is not only destructive to economic development but also statistically significant at all generally used thresholds, despite the fact that increases in the money supply, the value of the currency, and interest rates are all advantageous to economic growth. According to the data, it is possible to draw the conclusion that the probability of an exchange rate response to the economy of Nigeria is statistically significant at all conventional levels of significance, totaling to (0.0024). This demonstrates that fluctuations in the value of the naira over the course of time are advantageous to the economy of Nigeria.

The study comes to the conclusion, with a probability of half, that broad money has a long-term favorable influence on the economy of Nigeria. As a result, the null

hypothesis that there is no co-integration existent in the system is rejected (0.0001). Both the 0.05 threshold (which corresponds to a probability of 0.0005) and the -0.157528 coefficient level demonstrate that inflation is statistically significant. It is said that two entities have co-integrated when they come together to form a single entity. The assumption that there would be no beneficial consequences leads one to adopt the null hypothesis. As a result of this investigation, it was shown that there is no connection between growing GDP and increasing prices. It is also very unusual that the real effective exchange rate would shift at a level of importance that is lower than 5%. This is because of the previous point. As a consequence of this, the null hypothesis will be disproved, and co-integration will be found; this will demonstrate that the exchange rate does, in fact, have a lasting impact on the Nigerian economy. At the 0.0072 probability level, the real interest rate reaches the threshold for statistical significance (smaller than the 0.05 significance threshold). Therefore, we find that RINT has a considerable influence, both immediately and over time, on the exchange rate of the naira, which is evidence against the null hypothesis.

(ARDL) Short-run Test

Table 5

Variables	**Coefficients**	**Std.error**	**P-value**
REX(-1)	0.309206	0.081984	0.0023
FDI(-4)	10.16446	3.231113	0.0077
INF(-1)	2.787595	0.890488	0.0080
RINT(-1)	2.524060	1.204670	0.0563
ECM(-1)	-0.666945	0.042882	0.0000

Source: Author's Computation

According to the results of the short-run dynamic analysis, the ECM (-1) coefficient has a negative sign and is statistically significant at -0.666945. This is shown by the fact that it has a value of 0.666945. If a shock causes the economy to get out of balance, then it is anticipated that the economy will recover by 66.6945% during the course of the next year. According to the estimate made for the near term, shifts in the money supply, exchange rate, inflation, and interest rate all had a considerable impact, and most of it was positive, on the pace at which the economy expanded. The effects of the exchange rate on the Nigerian economy are broken out in the table that can be found below. Alterations in the value of the currency's exchange rate have a significant

influence on the economy of Nigeria, with a probability of D (REX (-1)) of 0.0001. As a result, the researcher concludes that the variables under consideration do, in fact, have a link in the short term, and they conclude that the null hypothesis that there is no co-integration should not be accepted. If we assume that the probability is 0.0257, then the Real Effective Exchange Rate has a 5% chance of being statistically significant. As a result, the absence of co-integration is challenged on the grounds that the variables do, in the short term, have a positive influence or link with one another. At the 5% significance level, Broad Money D (BM) has a probability of 0.0140, making it statistically significant. A connection between the two will be made clear in the not-too-distant future.

Residual Diagnostics Test

Table 6

Heteroskedasticity		**Serial Correlation**		**Normality Test**	
Obs *R-Squared	**P-Value**	**Obs*R-Squared**	**P-Value**	**Jarque-bera stats**	**P-Value**
19.28406	0.5665	2.808093	0.2456	0.021664	0.989227

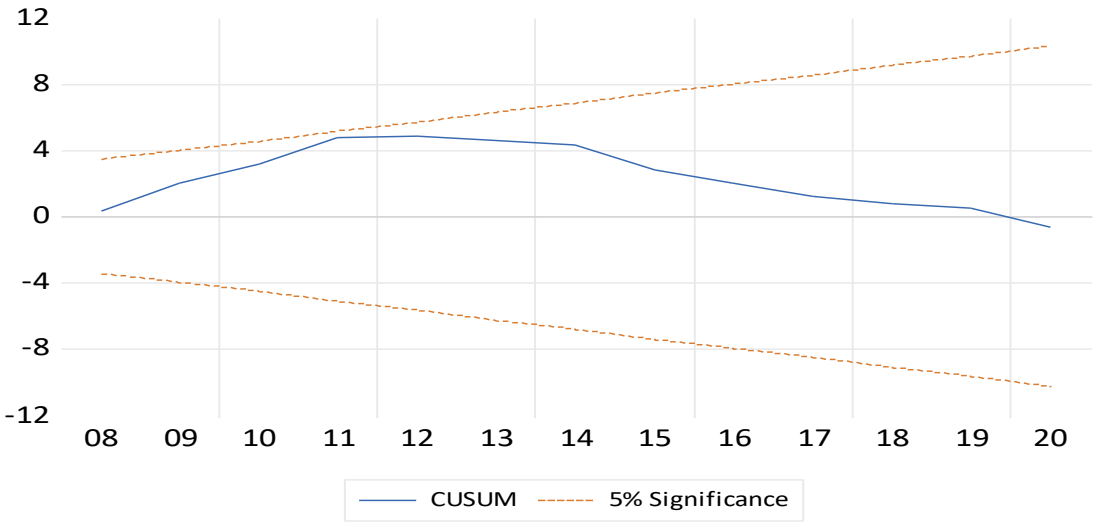
Source: Author's Computation

The Breusch-Pagan-Godfrey approach makes the assumption of a constant variance of residuals in order to adjust for heteroskedasticity. The null hypothesis also makes the assumption that this assumption is valid. On the other hand, as can be seen from the table that was just shown, the actual R-square value is much higher than 0.05 when the significance threshold is set at 5%. This result has to be accepted despite the fact that the model does not display any heteroskedasticity. In other words, we were unable to demonstrate why the alternative explanation is incorrect. According to the information shown in the preceding table, it is abundantly evident that the observed R-square value of 0.2085 is more significant than the null hypothesis derived from the LM test. This finding suggests that the model does not include any serial correlations.

Since this is the case, there is no need to be concerned about the model including autocorrelation. That is to say, we were unable to provide evidence to support the alternative theory. If the histogram Normality test probability value is lower than 0.05, the variables do not follow a normal distribution. This indicates that the data cannot be trusted. In contrast, if the probability value is larger than 0.05, then

one may conclude that the data follow a normal distribution. The findings of the normality test and the fact that the likelihood of the Jarque-Bera statistics is definitely more than 0.05 at the 5% significant level lend credence to the conclusion that the residuals follow a normal distribution, as shown by the findings of the research. This conclusion was reached as a result of the findings of the research.

Figure 1. Test for stability (Cusum test)

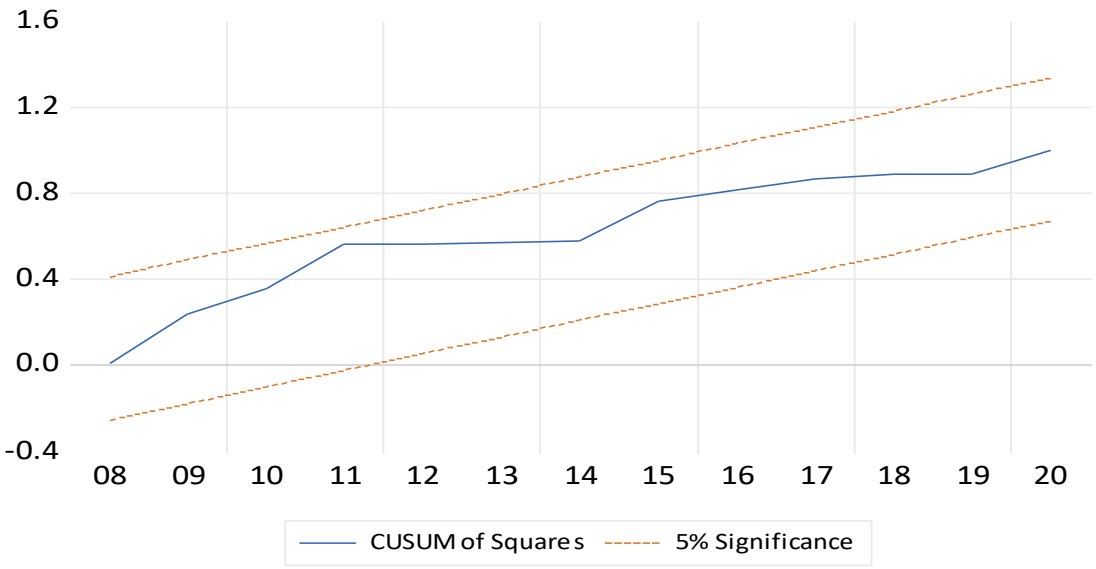


Source: Author's Computation

The results of a CUSUM test that was performed on the recursive residuals in order to assess the consistency of the predicted regression coefficients at a level of significance of 5% are shown in the figure that can be found after this sentence. There is no evidence to support the alternative, despite the fact that there is evidence supporting the null hypothesis (which claims that the parameters are stable). The findings of the tests demonstrate that the blue line is not outside of the crucial limit of 5%. As can be seen from the figure, while we were unable to reject the null hypothesis of stability in parameters, we were successful in rejecting the alternative hypothesis. This is due to the fact that we would rather suppose that residual variances are stable as opposed to unstable. It would seem, on the basis of the facts, that the residual variance is fairly constant throughout the course of time.

Cusum of square

The Cusum of the square test is one method that may be used by us in order to ascertain whether or not the parameters that were utilized in the development of this model contributed to the structural stability of the model. The information it provides is consistently brought up to date and shown in respect to certain criteria. As can be seen in the accompanying graph, the Cusum of squares statistics fall well within the permissible range of 5% to 10%. Because of this, the alternative hypothesis predicts that our parameters would vary quite a bit, but the null hypothesis predicts that our coefficients won't change all that much. It is not possible to reject the null hypothesis as long as the blue line is within 5% of the critical limit. Therefore, if we accept the null hypothesis, it indicates that the model is structurally sound, which is the conclusion we want to reach.



Source: Author's Computation

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Granger Causality Test

The Pairwise Granger Causality test is the method that is currently being used. The Granger Causality test determines whether or not one variable can reliably predict another variable using a different variable. In order to reject the null hypothesis and demonstrate statistical significance, the p-value must be lower than 0.05. A Granger Causality test's findings are shown in Table 6, which may be seen below.

Table 7

Null Hypothesis	Obs	F-Statistics	Prob. Value
FDI does not Granger Cause REX	38	0.05718	0.9445
REX does not Granger Cause FDI		1.80206	0.1808
INF does not Granger Cause REX	38	3.64920	0.0370
REX does not Granger Cause INF		1.40125	0.2606
RINT does not Granger Cause REX	38	4.94070	0.0133
REX does not Granger Cause RINT		0.80456	0.4559
INF does not Granger Cause FDI	38	1.32114	0.2806
FDI does not Granger Cause INF		3.80567	0.0326
RINT does not Granger Cause FDI	38	0.38832	0.6813
FDI does not Granger Cause RINT		1.67392	0.2030
RINT does not Granger Cause INF	38	1.57249	0.2227
INF does not Granger Cause RINT		1.23528	0.3038

Source: Author's Computation

According to the data, a substantial positive association exists between exchange rate volatility and Real FDI at the 5% level of significance, but this link does not exist in the opposite direction. At the 10% level of significance, the association between the two variables is a granger because of real FDI, and at the 5% level, the relationship is a granger because of real FDI. Moreover, the relationship is a granger because of real FDI. The granger impact of inflation is another factor that contributes to the volatility

of the market. Trade openness acts as a granger cause of the exchange rate, while foreign direct investment acts as a granger cause of trade openness. Both of these relationships are significant at the 10% level. Foreign direct investment does not deteriorate as a result of shifts in the value of a country's currency, contrary to the widespread perception that FDI exacerbates variations in exchange rates.

CHAPTER V
SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

The association between the Naira currency rate and foreign direct investment in Nigeria is the topic of this thesis, which spans the time period from 1981 to 2020 and investigates the data. Direct investment from abroad is one method that a parent company or multinational organization might use to manage its overseas subsidiaries (FDI). The process of investing foreign money in domestic companies, industries, and goods is referred to as "foreign direct investment," and the phrase "foreign direct investment" is used to characterize this activity. There is no discussion about the subject of foreign stock markets. In contrast to "hot money" stock transactions, foreign direct investment, often known as FDI, is considered to be more trustworthy and beneficial regardless of the outcome. Many individuals hold the opinion that foreign direct investment (FDI) is superior than investment from inside a developing country. It is generally accepted that economically developing countries can't make any forward unless they have some kind of foreign direct investment (FDI) (FDI). A study concluded that foreign direct investment (FDI) does have an impact on the economy of the country that receives it. These repercussions include more job opportunities, better levels of production and development, higher prices, and improved standards of living for the population of the host nation. The World Bank Data Site was the place where we were able to get this additional information.

Our research included the years 1981 through 2020. The majority of research projects end up producing conclusions that are the outcome of theoretical comprehension and statistical analysis. In this inquiry, the exact same approach that was used in the previous study was used. The World Bank Data Center provides quantitative information that may be accessed on a variety of sections and components. The data will be used to explore this possible cause and effect relationship between foreign direct investment (FDI) and Nigeria's currency rate. FDI stands for foreign direct investment. The Augmented Dickey-Fuller test may be used to determine whether or not a certain time series is stationary (ADF). When analyzing time series data, it is one of the statistical tests that is used the majority of the time. In order to carry out a time-series analysis, it is necessary to have data that is consistent. Those who use ARIMA to develop forecasts must first establish the amount of a shift that is necessary to render the series stationary. When applied to nonstationary time series

data, the model is unable to provide accurate predictions. Alright, let's try to acquire a better understanding of this, shall we? The Augmented Dickey-Fuller method was used in the analysis of the time series data (ADF). To establish whether or not the data are steady, the unit root test is used. An ADF test compares the alternative hypothesis against the null hypothesis, which states that the series is stable, in order to establish whether or not there is a unit root. A statistical metric known as the autoregressive distributed lag, or ARDL for short. Even while this form of regression model has been around for quite some time, it wasn't until very recently that it was demonstrated to be successful in finding long-run correlations between different economic time series.
The autoregressive distributed lag (ARDL) model is used to define the link between economic variables via the use of a single-equation time series structure. The 1970s were a great decade for fashion. Since nonstationary cointegration is analogous to an EC process, the ARDL model incorporates a parameterization in the form of an EC process. The Breusch-Godfrey serial correlation LM test is used in order to do research on the autocorrelation of regression model output. When doing a regression analysis, it is possible to derive a test statistic from the residuals produced by the model. The results do not support the idea that there is no sequential relationship up to rank p, which is the null hypothesis being tested. Through the use of autoregressive conditional heteroskedasticity (ARDL) models, it is possible to display changes in stock prices over time. These models take the passage of time into consideration. The ARDL models' assumptions concerning the link between the size of mistakes in the past and the degree to which they may change today are, for the most part, true. These assumptions concern the magnitude of errors in the past and the extent to which they may vary presently. heightened levels of unpredictability and volatility. A set of data is subjected to tests for normality in order to ascertain whether or not the data match the model of a normal distribution, or whether or not the random variable under investigation follows a normal distribution. Instability in the parameters of a nonlinear model is a rare occurrence, yet it may take place. Before the findings can be believed, a stability study of the calculated model has to be performed first. The CUSUM of Squares Test is an option for accomplishing this goal. Testing performed after the estimating process concludes the importance of maintaining the model's consistency throughout the estimation phase.

The CUSMUS tests ensure the validity of the multiple linear regression coefficients. When making an inference, it is common practice to either sum or square

the recursive residuals. In the context of recursive residuals, the phrase "standardized one-step-ahead prediction errors" is a common way to refer to this concept. When statistics are far outside of the range, this may be an indication that the fundamental structure of the model has been altered. This, however, is true despite the fact that the null hypothesis asserts that the parameters have remained unchanged. Cusum tests are used in multiple linear regression models to assess whether or not the coefficients are consistent. These models use y = X + as their equation. The repeated summing or quadrupling of residuals obtained via recursion is the method that is used to arrive at inferences. If the values of a series go outside of a predetermined range, the null hypothesis of stable coefficients asserts that the structure of the model has been altered, despite the fact that this assertion is false.

This takes happen when the values are very high.

G-causality is based on the notion that causes precede effects and are, as a consequence, outcomes that can be predicted. The primary goal of this theory is to forecast the effects that causes will have on subsequent events. Clive Granger, an econometrician, took Norbert Wiener's idea and ran with it in the form of linear vector autoregressive (VAR) models of random time series data (Granger, 1969). John Geweke and others have contributed significant expansions to the linear vector autoregressive (VAR) models that Granger developed. Virtually all regression models, also known as VARs, are simple mathematical constructions that explain the value of a variable at any given time as the (linear) weighted sum of data points in the past (often spanning a number of discrete time steps) plus a collection of additional variables in the past. These explanations are called vector autoregression models (VARs). When storing the time series for each individual variable, vector random processes are utilized to store the data. Each stage is characterized by a different group of independent factors. It is crucial to find the ideal weights prior to trying to fit a VAR model in order to cut down on estimate mistakes. This should be done before any fitting attempts are made.

There is a very large number of choices available. It is claimed that Y "G-causes" X when, in addition to the knowledge contained in Y's past (and any other "conditioned" variables Z), Y's past helps forecast Y's future. This is referred to as a "conditioned" variable. If X and Y are able to freely exchange and receive information from one another, then we will have achieved our goal and succeeded in what we set out to do. According to Barnett and colleagues, entropy may be calculated by utilizing

the G-causality formula (2009). Within the context of this application, Shannon's guided similarity measure is used. The degree of statistical association between two variables may be determined using Shannon's similarity, which is a calculation. We do not accept the null hypothesis and instead accept the alternative hypothesis that the series does have a long-run link. This suggests that the variables that the researcher employed were co-integrated, as can be seen in Table4. When compared to the asymptotic upper limit, the critical values of the F statistic are shown to be much higher at all conventional levels of significance. The study of the data suggests that there is a connection between the series over a longer period of time. According to the long-term statistics presented in the table above, the money supply coefficient is positive and statistically significant. This indicates that an increase of one percentage point in the money supply will result in a gain of 0.696886 percentage points in economic growth, provided that all other factors remain unchanged.

The positive and statistically significant exchange rate coefficient shows that a 1% rise in exchange rates would lead to a 0.02% increase in economic growth. This conclusion is based on the assumption that other variables would not undergo any changes. The inflation coefficient is statistically significant and negative at all possible values. This indicates that a one percentage point rise in inflation is equivalent to a -0.15 percentage point reduction in economic growth. It has been shown that a rise in the real interest rate may stimulate economic growth by 0.0072 percentage points under normal conditions.

The pace of development is slowed by inflation, but it is nevertheless substantial on all levels. The money supply, interest rate, and exchange rate are all factors that contribute to economic growth.

According to the findings, there is a statistically significant possibility that the Nigerian economy would create a long-term reaction in the currency market. This conclusion is drawn from the fact that the data suggests there is such a chance. Alterations in the value of the naira throughout the course of time are beneficial to the economy of Nigeria. According to the findings of the research, there is a 50 percent chance that wide money has a beneficial influence on the economy of Nigeria over the long run. Every time we look at the standard rate, there is a 0.0005 percent probability that inflation will occur, and the coefficient that goes along with it is -0.157528. When two entities are co-integrated, they will maintain their connection for an endless amount of time. In the long term, there are no beneficial benefits. arguing against the

theory that a higher inflation rate generates an increase in GDP It is quite improbable that the actual exchange rate is lower than 5%. If co-integration is found, as is very expected to be the case, then it will be shown that the exchange rate does have a large and enduring influence on the Nigerian economy, which would prove that the alternative hypothesis is incorrect.

The real interest rate is deemed significant when the nominal interest rate is more than 0.0072 and less than 0.05. In the long term, and contrary to predictions, RINT has an impact that is advantageous for the exchange rate of the Nigerian currency.

The ECM (-1) coefficient is notably negative, as shown by the findings of the short-run dynamic study (-0.749935). In the event that an economic shock causes a disruption, it is anticipated that the economy would recover by 74.91% the following year. In the short term, changes in money supply, currency rate, inflation, and interest rate all had a positive impact on the pace of economic growth. The following table illustrates how the country's Gross Domestic Product was affected by the country's exchange rate. Due to shifts in the value of the currency exchange rate, there is a standard deviation of 0.00001 in the changes that occur in the Nigerian economy (D (REX (-1)). The researcher comes to the conclusion that there is a relationship between the variables in the short term and, as a result, rejects the null hypothesis that there is no co-integration. At the 0.0257 level of statistical significance, a difference of 5 percentage points in the actual effective exchange rate is considered to be statistically significant. As a result of this positive short-run impact, we conclude that the null hypothesis that there is no co-integration should not be accepted. At the 5% significance level, Broad Money D (BM) has a probability of 0.0140, making it statistically significant. It won't be long until it's abundantly evident that these things are connected in some way that can be described as causative.

Under the assumption of a constant residual variance, the Breusch-Pagan-Godfrey method is used in order to take into consideration the presence of heteroscedasticity while testing the null hypothesis. The data shown in the table that follows reveals that the R-squared statistic reaches a threshold of statistical significance of 5%. As a consequence of this, it is possible to draw the conclusion that the model does not include any heteroscedasticity. The null hypothesis was not rejected, as expected.

According to the table that was just presented, it is evident that the null hypothesis from the LM test, which states that there is no serial correlation in the model, is less significant than the observed R-square value of 0.2085, which is more significant at every conventional level of significance. Because of this, there is no autocorrelation present in any of the models shown here. The null hypothesis was not rejected, as expected.

The variables in question do not adhere to a normal distribution if the likelihood of the histogram passing the normality test is less than 0.05.

If the probability is greater than 0.05, then the variables have a normal distribution; otherwise, the distribution is not normal. Additional evidence that the residuals in this study follow a normal distribution is provided by the normality test as well as the Jarque-Bera probability being bigger than 0.05 at the 5% level of significance.

The results of a CUSUM test that was done on the recursive residuals can be seen up above; the critical limit was set at the 5% level of significance for this particular analysis. In the case of the null hypothesis, it is assumed that the parameters are always the same, but in the case of the alternative, this is not the case. In the event that the blue line surpasses the barrier of 5%, then everything is in fine shape to proceed. As the image illustrates, we were unable to reject the null hypothesis of stability in parameters; but, we were successful in rejecting the alternative hypothesis. This is because we would rather believe that residual variances are stable as opposed to unstable. Evidence from statistics demonstrates that the residual variance does not change throughout the course of time. When measured in real terms, foreign direct investment (FDI) is encouraged by the sensitivity of the currency rate, but not the other way around. FDI variations in real terms cause FDI variations in exchange rate when the significance level is set at 10%. When the significance level is set at 5%, however, FDI variations in exchange rate cause FDI variations in real terms. The ripple effects of inflation may be seen all across the economy. The receipt of FDI results in a 10% increase in the amount of commercial freedom. Foreign direct investment does not create variations in the value of a country's currency, despite the prevalent belief to the contrary.

Conclusion

This thesis examines the link between Nigeria's foreign direct investment (FDI) and the country's currency rate between 1981 and 2020. Foreign direct

investment is the term used to describe when a parent company or multinational corporation invests in its abroad subsidiaries (FDI). Foreign direct investment in a country's enterprises, industries, or consumer products may be seen of as a kind of exportation. Stock markets located in other countries are not included in the coverage. Foreign direct investment (FDI), in contrast to "hot money" stock investments, is seen as having a longer-term perspective and being beneficial in any case, regardless of the result. Many people believe that direct investment from outside, often known as foreign direct investment (FDI), is superior than investment from inside the country. In conclusion, the findings of the ARDL bound test indicate that the F statistic critical values are larger than the asymptotic upper limit at all conventional levels of significance, which suggests that the variables used by the researcher in this study were co-integrated. Additionally, the findings of this test indicate that the F statistic critical values are larger than the asymptotic lower limit.

The results of this investigation thus give compelling evidence that there is a continuous connection between the series. In the meanwhile, the long-term statistics shown in the table above shows that the money supply coefficient is statistically positive and significant. This indicates that a 1% increase in money supply results in a 0.696886% rise in economic growth provided that all other factors remain constant. In a similar vein, a one percent increase in exchange rates results in a zero point two percent increase in economic growth, supposing that all other variables remain the same. This association is positive, and its significance may be shown by statistical analysis.

If we assume that all of the other variables will stay the same, then the results of all of the usual significance criteria for the negative inflation coefficient imply that a 1% rise in inflation will result in a 0.15% reduction in economic growth. If we assume that our assumptions are accurate, a one percentage point increase in the real interest rate would result in a 0.0072% increase in economic growth.

Inflation dampens these benefits while still being statistically significant at the 5%, 10%, and 5% levels, respectively, even if increases in the money supply, the exchange rate, and interest rates all contribute to economic development.

According to the findings, there is a statistically significant risk that the economy of Nigeria would cause a change in exchange rates in the long run, with a probability of (0.0024). To summarize, what this demonstrates is that shifts in the value of the naira, the currency of Nigeria, are good for the country's economy. According to the findings

of the study, the assumption that there is no co-integration does not hold, which indicates that wide money has a beneficial effect on the economy of Nigeria over the long run (0.0001). At every conventional level, inflation demonstrates statistically significant behavior, with a probability of 0.0005 and a coefficient of -0.157528 respectively. Co-integration refers to the process through which two different objects are brought together in a manner that is advantageous to both of them. The null hypothesis makes the prediction that there will be no positive effects throughout the course of time. As a direct consequence of this, it is impossible to draw a connection between an expanding GDP and rising prices. It is quite improbable that there would be any effective exchange rate with a significance of less than 5%. As a result, co-integration is discovered, which indicates that the exchange rate does, in fact, have a long-term influence on the economy of Nigeria; hence, the null hypothesis is refuted as a result.

The probability of 0.0072 for a significant real interest rate is less than the threshold of 0.05 that is used to determine statistical significance. As a result of this, we come to the conclusion that the null hypothesis, which states that RINT does not in any way alter the exchange rate of the Nigerian currency, is untrue. In addition to this, the ECM -1 coefficient is quite negative, coming in at -0.749935. This indicates that the economy will regain 74.9 percent of the ground it lost over the course of the next year in the event that a shock produces economic disequilibrium. Based on the findings of the short-term estimate, it was revealed that the monetary base, interest rate, inflation rate, and exchange rate all contributed favorably to the growth of the economy. The following table illustrates how changes in the currency exchange rate have impacted the economy of Nigeria. A statistically significant impact is exerted on the whole of the Nigerian economy if there is a shift in the value of the currency exchange rate, and the probability of event D (REX (-1)) is 0.0001. The researcher comes to the conclusion that the null hypothesis that there is no co-integration should be rejected since it has been proved that the variables in the study are related in the short term.

The likelihood of the real effective exchange rate being 0.0257 is based on a degree of confidence of 5%. As a result of this, the null hypothesis stating that there is no co-integration can no longer be accepted, and instead, one must infer the presence of a positive influence or link between the variables into the foreseeable future. With a value of 0.0140, the likelihood of Broad Money D (BM) being significantly different

from zero is statistically significant at the 5% level. In a short amount of time, a favourable connection between these elements will be developed. The findings, which corroborate the findings of the Granger causality test, point to a potential cause of exchange rate volatility that is more broad. Around lower levels, real foreign direct investment is not remarkable; nevertheless, it becomes significant at 5%. At a significance level of 5%, the reversal is true with respect to the granger causality between the exchange rate and actual FDI, whereas the former has a value of 10%. Another issue that leads to an unstable economy is inflation. Trade openness and foreign direct investment both reach the 10% threshold of significance and are the primary contributors to fluctuations in exchange rates. Contrary to popular belief, foreign direct investment (FDI) does not result in an increase in the range of possible values for a currency's price.

Recommendations

These results could be of use to managers and policymakers in gaining a better understanding of the long-term and short-term fluctuations in exchange rates and patterns of FDI flow. It is crucial for managers and policymakers to have awareness of the dynamic link that exists between exchange rates and flows of FDI. When considering whether or not to purchase assets from a country located outside of their own, investors in the country that is the source of foreign direct investment (FDI) worry most about a predictable flow of future income and returns in their own currency. Inflows of foreign direct investment (FDI) are sensitive to both the actual and predicted variations in the value of a country's currency; as a result, policymakers should take this into consideration if they wish to maintain steady FDI flows. Therefore, rapid shifts in currency rates may worsen flows of foreign direct investment (FDI). To this purpose, a system of currency rates that is either set or regulated floating might perhaps help restrict the unpredictable swings in foreign direct investment (FDI). As a result, the paper recommends that future research should analyze investment flows with the purpose of determining how the effects of various exchange rates are felt in various parts of the economy.

Because investment decisions seem to be made over the long term, research also suggests implementing systematic exchange rate (monetary) policy to include exchange rate movements to attract FDI over the long term and keep economic progress rolling.

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Appendices

Appendix A

Descriptive Statistics

Date: 01/17/23 Time: 00:12
Sample: 1981 2020

	REX	FDI	INF	RINT
Mean	147.9720	1.500125	21.67358	0.434224
Median	100.5465	1.126314	10.75185	4.326392
Maximum	536.8903	5.790847	219.0028	18.18000
Minimum	49.74471	0.195183	0.686099	-65.85715
Std. Dev.	117.1855	1.245262	35.11192	14.44028
Skewness	1.905585	1.722291	4.680593	-2.680369
Kurtosis	5.839433	6.023093	26.41185	12.58348
Jarque-Bera	37.64566	35.00706	1059.577	200.9676
Probability	0.000000	0.000000	0.000000	0.000000
Sum	5918.882	60.00501	866.9432	17.36898
Sum Sq. Dev.	535564.9	60.47639	48081.03	8132.346
Observations	40	40	40	40

Unit Root

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.088687	0.2501
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REX)
Method: Least Squares
Date: 01/18/23 Time: 23:35
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REX(-1)	-0.178060	0.085250	-2.088687	0.0437
C	21.27460	16.13805	1.318288	0.1955

R-squared	0.105472	Mean dependent var	-5.212479
Adjusted R-squared	0.081296	S.D. dependent var	65.03182
S.E. of regression	62.33238	Akaike info criterion	11.15276
Sum squared resid	143757.0	Schwarz criterion	11.23807
Log likelihood	-215.4788	Hannan-Quinn criter.	11.18337
F-statistic	4.362614	Durbin-Watson stat	1.277206
Prob(F-statistic)	0.043673		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.290849	0.0016
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REX,2)
Method: Least Squares
Date: 01/18/23 Time: 23:37
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REX(-1))	-0.676173	0.157585	-4.290849	0.0001
C	-3.880968	10.28076	-0.377498	0.7080

R-squared	0.338374	Mean dependent var	-0.363548
Adjusted R-squared	0.319995	S.D. dependent var	76.60834
S.E. of regression	63.17307	Akaike info criterion	11.18083
Sum squared resid	143670.1	Schwarz criterion	11.26702
Log likelihood	-210.4358	Hannan-Quinn criter.	11.21149
F-statistic	18.41138	Durbin-Watson stat	1.788205
Prob(F-statistic)	0.000128		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.024611	0.5700
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REX)
Method: Least Squares
Date: 01/18/23 Time: 23:37
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REX(-1)	-0.203348	0.100438	-2.024611	0.0504
C	35.26700	32.90478	1.071789	0.2909
@TREND("1981")	-0.511542	1.044850	-0.489585	0.6274

R-squared	0.111389	Mean dependent var	-5.212479
Adjusted R-squared	0.062022	S.D. dependent var	65.03182
S.E. of regression	62.98285	Akaike info criterion	11.19741
Sum squared resid	142806.2	Schwarz criterion	11.32537
Log likelihood	-215.3494	Hannan-Quinn criter.	11.24332
F-statistic	2.256331	Durbin-Watson stat	1.257857
Prob(F-statistic)	0.119347		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.276456	0.0087
Test critical values:	1% level	-4.219126	
	5% level	-3.533083	
	10% level	-3.198312	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(REX,2)
Method: Least Squares
Date: 01/18/23 Time: 23:38
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REX(-1))	-0.684759	0.160123	-4.276456	0.0001
C	-13.83409	22.14246	-0.624777	0.5362
@TREND("1981")	0.483339	0.949591	0.508997	0.6139

R-squared	0.343235	Mean dependent var	-0.363548
Adjusted R-squared	0.305706	S.D. dependent var	76.60834
S.E. of regression	63.83337	Akaike info criterion	11.22609
Sum squared resid	142614.5	Schwarz criterion	11.35537
Log likelihood	-210.2956	Hannan-Quinn criter.	11.27208
F-statistic	9.145767	Durbin-Watson stat	1.789949
Prob(F-statistic)	0.000638		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.835388	0.0055
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 01/18/23 Time: 23:38
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.564868	0.147278	-3.835388	0.0005
C	0.866801	0.289015	2.999151	0.0048

R-squared	0.284474	Mean dependent var	0.005693
Adjusted R-squared	0.265135	S.D. dependent var	1.325833
S.E. of regression	1.136561	Akaike info criterion	3.143811
Sum squared resid	47.79548	Schwarz criterion	3.229122
Log likelihood	-59.30431	Hannan-Quinn criter.	3.174419
F-statistic	14.71020	Durbin-Watson stat	2.020287
Prob(F-statistic)	0.000472		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.126918	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 01/18/23 Time: 23:38
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.294440	0.159278	-8.126918	0.0000
C	0.008014	0.211176	0.037949	0.9699

R-squared	0.647221	Mean dependent var	0.001724
Adjusted R-squared	0.637421	S.D. dependent var	2.161884
S.E. of regression	1.301768	Akaike info criterion	3.416519
Sum squared resid	61.00557	Schwarz criterion	3.502708
Log likelihood	-62.91386	Hannan-Quinn criter.	3.447184
F-statistic	66.04679	Durbin-Watson stat	2.128648
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.787664	0.0280
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI)
Method: Least Squares
Date: 01/18/23 Time: 23:39
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI(-1)	-0.563862	0.148868	-3.787664	0.0006
C	1.019041	0.435973	2.337392	0.0251
@TREND("1981")	-0.007689	0.016345	-0.470389	0.6409

R-squared	0.288845	Mean dependent var	0.005693
Adjusted R-squared	0.249336	S.D. dependent var	1.325833
S.E. of regression	1.148713	Akaike info criterion	3.188965
Sum squared resid	47.50351	Schwarz criterion	3.316932
Log likelihood	-59.18482	Hannan-Quinn criter.	3.234878
F-statistic	7.310933	Durbin-Watson stat	2.034872
Prob(F-statistic)	0.002165		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.083029	0.0000
Test critical values:	1% level	-4.219126	
	5% level	-3.533083	
	10% level	-3.198312	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(FDI,2)
Method: Least Squares
Date: 01/18/23 Time: 23:39
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FDI(-1))	-1.302333	0.161119	-8.083029	0.0000
C	0.259429	0.452635	0.573152	0.5702
@TREND("1981")	-0.012262	0.019480	-0.629477	0.5331

R-squared	0.651170	Mean dependent var	0.001724
Adjusted R-squared	0.631237	S.D. dependent var	2.161884
S.E. of regression	1.312823	Akaike info criterion	3.457893
Sum squared resid	60.32264	Schwarz criterion	3.587176
Log likelihood	-62.69997	Hannan-Quinn criter.	3.503891
F-statistic	32.66768	Durbin-Watson stat	2.140571
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.78712	0.0000
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 01/18/23 Time: 23:41
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.914343	0.066319	-13.78712	0.0000
C	14.72699	2.744867	5.365283	0.0000

R-squared	0.837065	Mean dependent var	-5.414197
Adjusted R-squared	0.832661	S.D. dependent var	35.47623
S.E. of regression	14.51227	Akaike info criterion	8.237787
Sum squared resid	7792.423	Schwarz criterion	8.323097
Log likelihood	-158.6368	Hannan-Quinn criter.	8.268395
F-statistic	190.0846	Durbin-Watson stat	1.037023
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-16.41654	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 01/18/23 Time: 23:41
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.055833	0.064315	-16.41654	0.0000
C	-0.489506	2.308619	-0.212034	0.8333

R-squared	0.882161	Mean dependent var	5.306965
Adjusted R-squared	0.878888	S.D. dependent var	40.41206
S.E. of regression	14.06385	Akaike info criterion	8.176289
Sum squared resid	7120.512	Schwarz criterion	8.262478
Log likelihood	-153.3495	Hannan-Quinn criter.	8.206954
F-statistic	269.5027	Durbin-Watson stat	2.318744
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.73655	0.0000
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF)
Method: Least Squares
Date: 01/18/23 Time: 23:42
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF(-1)	-0.957868	0.069731	-13.73655	0.0000
C	22.98213	5.595901	4.106958	0.0002
@TREND("1981")	-0.364818	0.217102	-1.680398	0.1015

R-squared	0.848916	Mean dependent var	-5.414197
Adjusted R-squared	0.840522	S.D. dependent var	35.47623
S.E. of regression	14.16732	Akaike info criterion	8.213556
Sum squared resid	7225.662	Schwarz criterion	8.341522
Log likelihood	-157.1643	Hannan-Quinn criter.	8.259469
F-statistic	101.1388	Durbin-Watson stat	1.049856
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-15.69452	0.0000
Test critical values:	1% level	-4.219126	
	5% level	-3.533083	
	10% level	-3.198312	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(INF,2)
Method: Least Squares
Date: 01/18/23 Time: 23:42
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	-1.055755	0.067269	-15.69452	0.0000
C	-0.467828	5.118161	-0.091405	0.9277
@TREND("1981")	-0.001036	0.217606	-0.004763	0.9962

R-squared	0.882161	Mean dependent var	5.306965
Adjusted R-squared	0.875428	S.D. dependent var	40.41206
S.E. of regression	14.26335	Akaike info criterion	8.228920
Sum squared resid	7120.508	Schwarz criterion	8.358203
Log likelihood	-153.3495	Hannan-Quinn criter.	8.274918
F-statistic	131.0083	Durbin-Watson stat	2.318969
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.359547	0.0000
Test critical values:	1% level	-3.610453	
	5% level	-2.938987	
	10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RINT)
Method: Least Squares
Date: 01/18/23 Time: 23:43
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RINT(-1)	-0.750728	0.102007	-7.359547	0.0000
C	2.057319	1.471083	1.398506	0.1703

R-squared	0.594133	Mean dependent var	1.826370
Adjusted R-squared	0.583164	S.D. dependent var	14.22617
S.E. of regression	9.184822	Akaike info criterion	7.322902
Sum squared resid	3121.355	Schwarz criterion	7.408213
Log likelihood	-140.7966	Hannan-Quinn criter.	7.353511
F-statistic	54.16293	Durbin-Watson stat	1.668123
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.968538	0.0000
Test critical values:	1% level	-3.615588	
	5% level	-2.941145	
	10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RINT,2)
Method: Least Squares
Date: 01/18/23 Time: 23:43
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RINT(-1))	-1.173086	0.117679	-9.968538	0.0000
C	0.582608	1.688141	0.345118	0.7320

R-squared	0.734066	Mean dependent var	-1.590049
Adjusted R-squared	0.726679	S.D. dependent var	19.73848
S.E. of regression	10.31931	Akaike info criterion	7.557106
Sum squared resid	3833.571	Schwarz criterion	7.643295
Log likelihood	-141.5850	Hannan-Quinn criter.	7.587771
F-statistic	99.37175	Durbin-Watson stat	2.184367
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.579490	0.0000
Test critical values:	1% level	-4.211868	
	5% level	-3.529758	
	10% level	-3.196411	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RINT)
Method: Least Squares
Date: 01/18/23 Time: 23:44
Sample (adjusted): 1982 2020
Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RINT(-1)	-0.850234	0.112176	-7.579490	0.0000
C	-3.283635	3.192827	-1.028441	0.3106
@TREND("1981")	0.268578	0.143706	1.868944	0.0698

R-squared	0.630030	Mean dependent var	1.826370
Adjusted R-squared	0.609476	S.D. dependent var	14.22617
S.E. of regression	8.890206	Akaike info criterion	7.281581
Sum squared resid	2845.287	Schwarz criterion	7.409547
Log likelihood	-138.9908	Hannan-Quinn criter.	7.327494
F-statistic	30.65261	Durbin-Watson stat	1.630115
Prob(F-statistic)	0.000000		

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.726595	0.0000
Test critical values:	1% level	-4.219126	
	5% level	-3.533083	
	10% level	-3.198312	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(RINT,2)
Method: Least Squares
Date: 01/18/23 Time: 23:44
Sample (adjusted): 1983 2020
Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(RINT(-1))	-1.183022	0.121628	-9.726595	0.0000
C	1.897599	3.698480	0.513075	0.6111
@TREND("1981")	-0.063248	0.157779	-0.400865	0.6910

R-squared	0.735281	Mean dependent var	-1.590049
Adjusted R-squared	0.720154	S.D. dependent var	19.73848
S.E. of regression	10.44174	Akaike info criterion	7.605157
Sum squared resid	3816.050	Schwarz criterion	7.734440
Log likelihood	-141.4980	Hannan-Quinn criter.	7.651155
F-statistic	48.60784	Durbin-Watson stat	2.171765
Prob(F-statistic)	0.000000		

ARDL Long Run Form and Bounds Test
Dependent Variable: D(REX)
Selected Model: ARDL(3, 5, 5, 4)
Case 5: Unrestricted Constant and Unrestricted Trend
Date: 01/17/23 Time: 00:20
Sample: 1981 2020
Included observations: 35

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.67432	38.17741	-0.620113	0.5459
@TREND	3.101479	0.576418	5.380609	0.0001
REX(-1)*	-0.666945	0.078848	-8.458626	0.0000
FDI(-1)	6.840572	4.892853	1.398074	0.1855
INF(-1)	1.018658	1.076429	0.946331	0.3612
RINT(-1)	-4.222790	1.761872	-2.396763	0.0323
D(REX(-1))	-0.023850	0.058940	-0.404644	0.6923
D(REX(-2))	-0.194002	0.057789	-3.357062	0.0052
D(FDI)	-7.972177	2.967270	-2.686704	0.0187
D(FDI(-1))	-14.91643	5.095636	-2.927294	0.0118
D(FDI(-2))	-19.49088	4.386005	-4.443880	0.0007
D(FDI(-3))	-15.45814	4.259171	-3.629378	0.0031
D(FDI(-4))	-5.293677	3.666527	-1.443785	0.1725
D(INF)	-0.960359	0.873169	-1.099854	0.2913
D(INF(-1))	0.808578	1.006368	0.803461	0.4362
D(INF(-2))	1.153285	1.003478	1.149287	0.2711
D(INF(-3))	3.029611	0.826882	3.663898	0.0029
D(INF(-4))	-0.598408	0.112340	-5.326753	0.0001
D(RINT)	-1.893821	1.120580	-1.690036	0.1148
D(RINT(-1))	4.853029	1.463868	3.315210	0.0056
D(RINT(-2))	3.512645	1.412749	2.486390	0.0273
D(RINT(-3))	3.856921	1.159217	3.327179	0.0055

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	10.25658	7.888240	1.300237	0.2161
INF	1.527351	1.720890	0.887535	0.3909
RINT	-6.331546	2.238378	-2.828632	0.0142

EC = REX - (10.2566*FDI + 1.5274*INF -6.3315*RINT)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	49.13571	10%	3.47	4.45
k	3	5%	4.01	5.07
		2.5%	4.52	5.62
		1%	5.17	6.36
Actual Sample Size	35	Finite Sample: n=35		
		10%	3.8	4.888
		5%	4.568	5.795
		1%	6.38	7.73

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-8.458626	10%	-3.13	-3.84
		5%	-3.41	-4.16
		2.5%	-3.65	-4.42
		1%	-3.96	-4.73

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

F-statistic	0.759595	Prob. F(21,13)	0.7215
Obs*R-squared	19.28406	Prob. Chi-Square(21)	0.5669
Scaled explained SS	2.541489	Prob. Chi-Square(21)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/17/23 Time: 00:21
Sample: 1986 2020
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	385.5803	245.7089	1.569257	0.1406
REX(-1)	-1.013770	0.527648	-1.921298	0.0769
REX(-2)	0.471050	0.500263	0.941604	0.3636
REX(-3)	-0.499314	0.371929	-1.342498	0.2024
FDI	23.11678	19.09728	1.210475	0.2476
FDI(-1)	-58.08653	21.23819	-2.735004	0.0170
FDI(-2)	27.54422	17.17575	1.603669	0.1328
FDI(-3)	-7.546876	18.31879	-0.411975	0.6871
FDI(-4)	-34.11227	20.79536	-1.640379	0.1249
FDI(-5)	39.21101	23.59768	1.661647	0.1205
INF	6.110940	5.619696	1.087415	0.2966
INF(-1)	-13.92034	5.731158	-2.428888	0.0304
INF(-2)	3.018463	6.074281	0.496925	0.6275
INF(-3)	1.487360	5.325311	0.279300	0.7844
INF(-4)	-5.908293	5.308091	-1.113073	0.2858
INF(-5)	0.753586	0.723018	1.042277	0.3163
RINT	8.485286	7.212025	1.176547	0.2605
RINT(-1)	-19.08415	7.753227	-2.461446	0.0286
RINT(-2)	0.448241	7.645460	0.058628	0.9541
RINT(-3)	1.413416	7.031619	0.201009	0.8438
RINT(-4)	-7.112949	7.460690	-0.953390	0.3578
@TREND	-0.646951	3.709811	-0.174389	0.8642

R-squared	0.550973	Mean dependent var	48.28219
Adjusted R-squared	-0.174378	S.D. dependent var	67.71208
S.E. of regression	73.37872	Akaike info criterion	11.69589
Sum squared resid	69997.68	Schwarz criterion	12.67354
Log likelihood	-182.6781	Hannan-Quinn criter.	12.03337
F-statistic	0.759595	Durbin-Watson stat	1.876021
Prob(F-statistic)	0.721478		

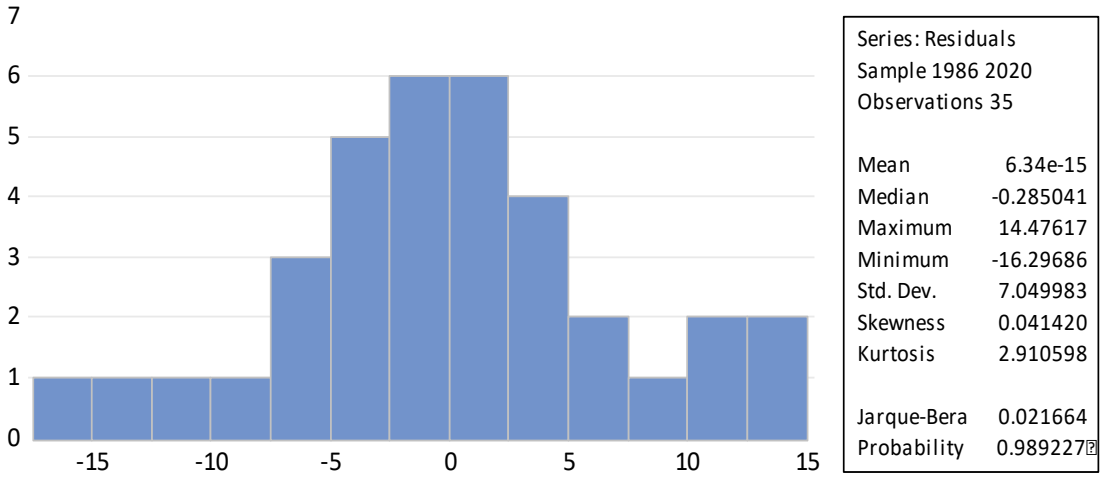
Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.479764	Prob. F(2,11)	0.6313
Obs*R-squared	2.808093	Prob. Chi-Square(2)	0.2456

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 01/17/23 Time: 00:22
Sample: 1986 2020
Included observations: 35
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REX(-1)	-0.034468	0.096576	-0.356899	0.7279
REX(-2)	0.017917	0.086682	0.206698	0.8400
REX(-3)	-0.048360	0.078121	-0.619033	0.5485
FDI	-3.234870	4.609430	-0.701794	0.4974
FDI(-1)	-2.155539	4.386608	-0.491391	0.6328
FDI(-2)	1.465136	3.196916	0.458297	0.6557
FDI(-3)	-1.440097	3.430045	-0.419848	0.6827
FDI(-4)	-0.442352	3.399408	-0.130126	0.8988
FDI(-5)	1.700622	4.198597	0.405045	0.6932
INF	-0.203427	1.038079	-0.195964	0.8482
INF(-1)	-0.647021	1.144124	-0.565516	0.5831
INF(-2)	0.195666	1.062718	0.184119	0.8573
INF(-3)	0.084355	0.868762	0.097098	0.9244
INF(-4)	0.156942	0.884149	0.177506	0.8623
INF(-5)	-0.000107	0.120962	-0.000886	0.9993
RINT	-0.110187	1.224435	-0.089990	0.9299
RINT(-1)	-0.706693	1.448745	-0.487796	0.6353
RINT(-2)	0.135613	1.357528	0.099897	0.9222
RINT(-3)	0.394361	1.223918	0.322212	0.7533
RINT(-4)	0.351681	1.284319	0.273827	0.7893
C	39.18812	56.69980	0.691151	0.5038
@TREND	-0.735436	0.975087	-0.754226	0.4666
RESID(-1)	-0.291285	0.508034	-0.573357	0.5779
RESID(-2)	-0.593587	0.618133	-0.960291	0.3575

R-squared	0.080231	Mean dependent var	6.34E-15
Adjusted R-squared	-1.842922	S.D. dependent var	7.049983
S.E. of regression	11.88695	Akaike info criterion	8.002735
Sum squared resid	1554.296	Schwarz criterion	9.069260
Log likelihood	-116.0479	Hannan-Quinn criter.	8.370899
F-statistic	0.041719	Durbin-Watson stat	1.955884
Prob(F-statistic)	1.000000		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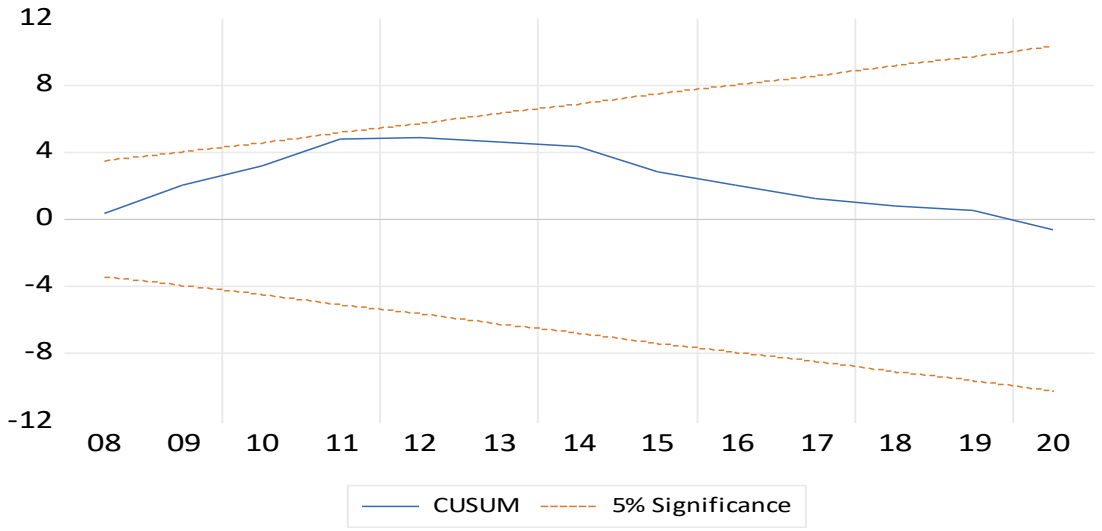
Series: Residuals
Sample 1986 2020
Observations 35
Mean 6.34e-15
Median -0.285041
Maximum 14.47617
Minimum -16.29686
Std. Dev. 7.049983
Skewness 0.041420
Kurtosis 2.910598
Jarque-Bera 0.021664
Probability 0.989227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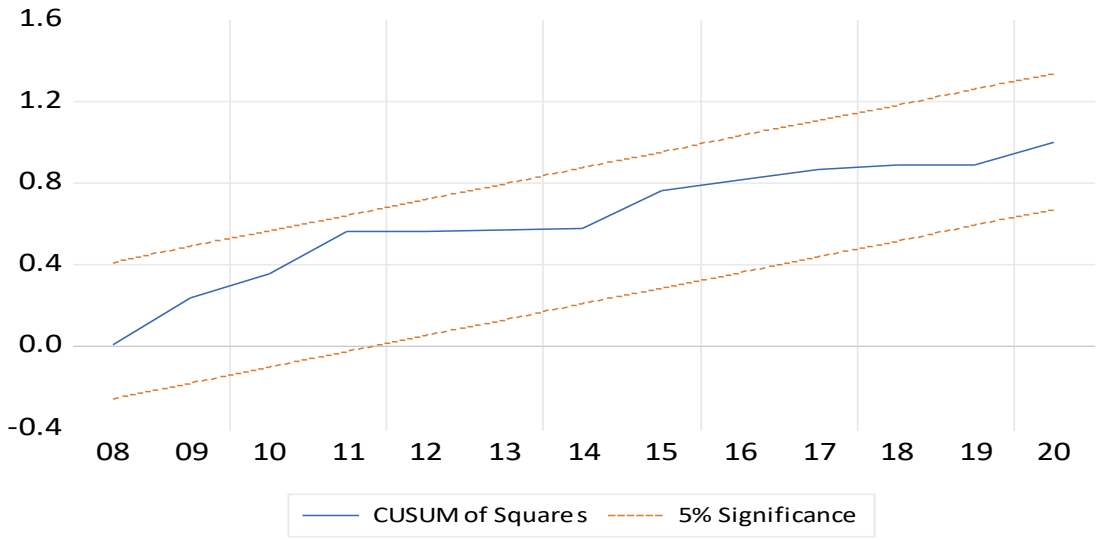
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CUSUM of Squares
5% Significance

ARDL Error Correction Regression
Dependent Variable: D(REX)
Selected Model: ARDL(3, 5, 5, 4)
Case 5: Unrestricted Constant and Unrestricted Trend
Date: 01/17/23 Time: 00:17
Sample: 1981 2020
Included observations: 35

ECM Regression
Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.67432	5.335081	-4.437481	0.0007
@TREND	3.101479	0.253474	12.23590	0.0000
D(REX(-1))	-0.023850	0.042428	-0.562117	0.5836
D(REX(-2))	-0.194002	0.040220	-4.823519	0.0003
D(FDI)	-7.972177	2.228236	-3.577798	0.0034
D(FDI(-1))	-14.91643	3.369690	-4.426647	0.0007
D(FDI(-2))	-19.49088	3.200157	-6.090601	0.0000
D(FDI(-3))	-15.45814	3.207878	-4.818805	0.0003
D(FDI(-4))	-5.293677	3.066574	-1.726251	0.1080
D(INF)	-0.960359	0.717134	-1.339163	0.2035
D(INF(-1))	0.808578	0.766562	1.054811	0.3107
D(INF(-2))	1.153285	0.753990	1.529575	0.1501
D(INF(-3))	3.029611	0.710815	4.262167	0.0009
D(INF(-4))	-0.598408	0.099243	-6.029728	0.0000
D(RINT)	-1.893821	0.892739	-2.121359	0.0537
D(RINT(-1))	4.853029	0.966812	5.019622	0.0002
D(RINT(-2))	3.512645	0.932453	3.767103	0.0023
D(RINT(-3))	3.856921	0.953674	4.044275	0.0014
CointEq(-1)*	-0.666945	0.042882	-15.55310	0.0000

R-squared	0.986956	Mean dependent var	-10.43376
Adjusted R-squared	0.972281	S.D. dependent var	61.72703
S.E. of regression	10.27703	Akaike info criterion	7.800654
Sum squared resid	1689.877	Schwarz criterion	8.644986
Log likelihood	-117.5114	Hannan-Quinn criter.	8.092117
F-statistic	67.25426	Durbin-Watson stat	2.006590
Prob(F-statistic)	0.000000		

* p-value incompatible with t-Bounds distribution.

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	49.13571	10%	3.47	4.45
k	3	5%	4.01	5.07
		2.5%	4.52	5.62
		1%	5.17	6.36

t-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-15.55310	10%	-3.13	-3.84
		5%	-3.41	-4.16
		2.5%	-3.65	-4.42
		1%	-3.96	-4.73

Dependent Variable: REX
Method: ARDL
Date: 01/17/23 Time: 00:16
Sample (adjusted): 1986 2020
Included observations: 35 after adjustments
Maximum dependent lags: 3 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (5 lags, automatic): FDI INF RINT
Fixed regressors: C @TREND
Number of models evaluated: 648
Selected Model: ARDL(3, 5, 5, 4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
REX(-1)	0.309206	0.081984	3.771531	0.0023
REX(-2)	-0.170152	0.077729	-2.189037	0.0474
REX(-3)	0.194002	0.057789	3.357062	0.0052
FDI	-7.972177	2.967270	-2.686704	0.0187
FDI(-1)	-0.103677	3.299918	-0.031418	0.9754
FDI(-2)	-4.574456	2.668710	-1.714108	0.1102
FDI(-3)	4.032745	2.846311	1.416832	0.1800
FDI(-4)	10.16446	3.231113	3.145808	0.0077
FDI(-5)	5.293677	3.666527	1.443785	0.1725
INF	-0.960359	0.873169	-1.099854	0.2913
INF(-1)	2.787595	0.890488	3.130413	0.0080
INF(-2)	0.344707	0.943801	0.365233	0.7208
INF(-3)	1.876327	0.827429	2.267660	0.0410
INF(-4)	-3.628020	0.824753	-4.398916	0.0007
INF(-5)	0.598408	0.112340	5.326753	0.0001
RINT	-1.893821	1.120580	-1.690036	0.1148
RINT(-1)	2.524060	1.204670	2.095229	0.0563
RINT(-2)	-1.340384	1.187926	-1.128340	0.2796
RINT(-3)	0.344276	1.092549	0.315113	0.7577
RINT(-4)	-3.856921	1.159217	-3.327179	0.0055
C	-23.67432	38.17741	-0.620113	0.5459
@TREND	3.101479	0.576418	5.380609	0.0001

R-squared	0.983377	Mean dependent var	110.2894
Adjusted R-squared	0.956523	S.D. dependent var	54.68000
S.E. of regression	11.40134	Akaike info criterion	7.972083
Sum squared resid	1689.877	Schwarz criterion	8.949730
Log likelihood	-117.5114	Hannan-Quinn criter.	8.309566
F-statistic	36.62055	Durbin-Watson stat	2.006590
Prob(F-statistic)	0.000000		

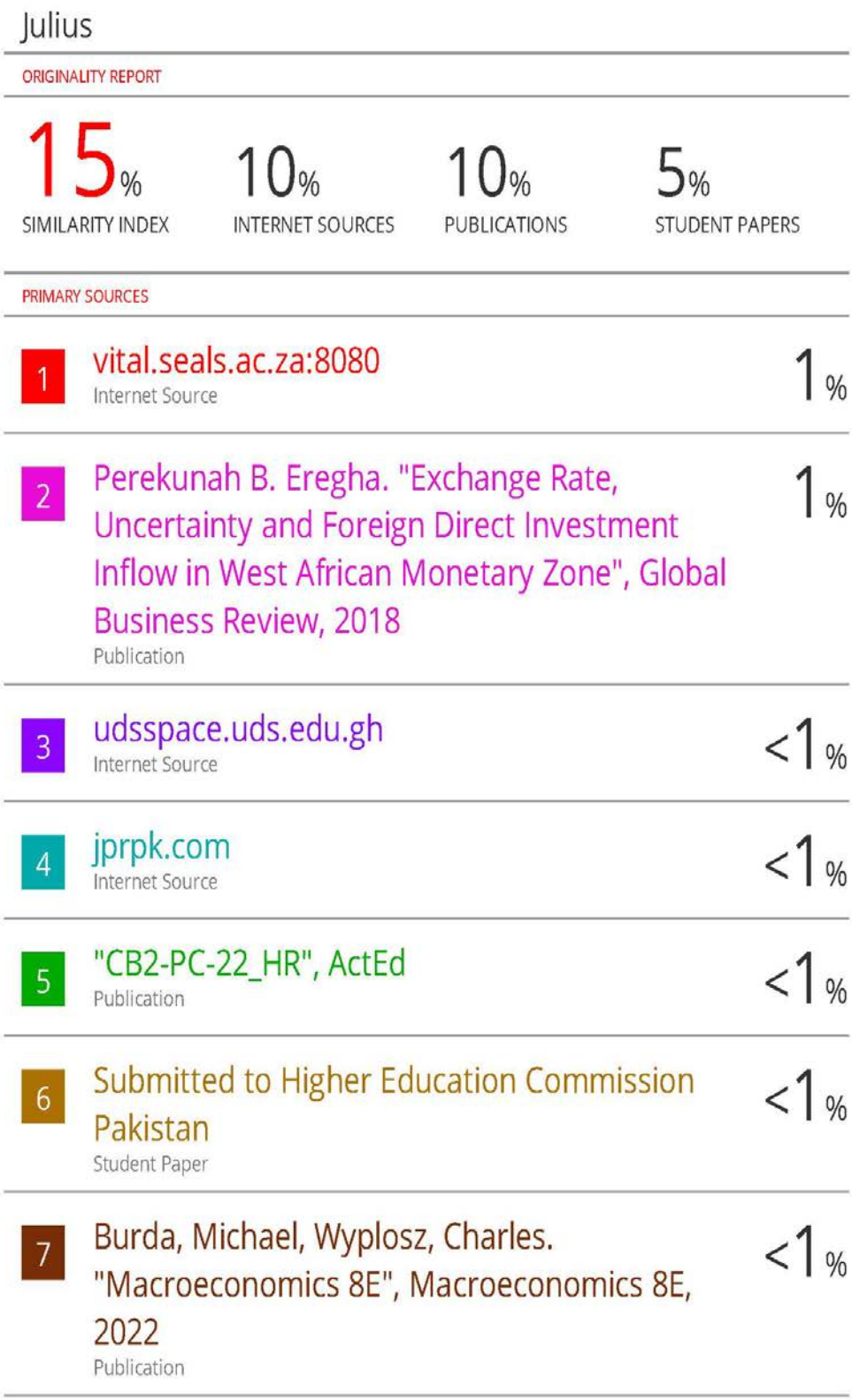
*Note: p-values and any subsequent tests do not account for model selection.

Pairwise Granger Causality Tests
Date: 01/17/23 Time: 00:13
Sample: 1981 2020
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause REX	38	0.05718	0.9445
REX does not Granger Cause FDI		1.80206	0.1808
INF does not Granger Cause REX	38	3.64920	0.0370
REX does not Granger Cause INF		1.40125	0.2606
RINT does not Granger Cause REX	38	4.94070	0.0133
REX does not Granger Cause RINT		0.80456	0.4559
INF does not Granger Cause FDI	38	1.32114	0.2806
FDI does not Granger Cause INF		3.80567	0.0326
RINT does not Granger Cause FDI	38	0.38832	0.6813
FDI does not Granger Cause RINT		1.67392	0.2030
RINT does not Granger Cause INF	38	1.57249	0.2227
INF does not Granger Cause RINT		1.23528	0.3038

Appendix B

Turnitin Similarity Report



Julius

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