JONETTE K. MASSAQUOI

THE IMPACT OF THE EXCHANGE RATE, FOREIGN DIRECT INVESTMENT ON GHANA'S ECONOMY

MSc. THESIS

JANUARY, 2023

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Approval

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Declaration

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

JONETTE K. MASSAQUOI

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Abstracts

This thesis investigates the influence of currency rates and FDI on the Ghanaian economy from 1990 to 2020. The financial position of an economy may be jeopardized as a result of fluctuations in its foreign exchange rate. Changes in the value of the foreign currency market may have an impact on consumer, company, and government pricing. Benita and Lauterbach (2004) proved that variations in exchange rates have important economic effects that affect price stability, company profitability, and country stability. The stock market is especially vulnerable to the impact of exchange rate variations on a country's broader financial system. Ghana is a wonderful example of a small, open economy. Because it engages in international trade with a wide range of countries, the value of its currency fluctuates in relation to the currencies of other countries. The Ghana Stock Exchange, which is today regarded as a growing market, was established in July 1989 in compliance with the Companies Code of 1963 rules for a private business limited by guarantee. The ADF unit root test is used for variable stationary testing. The regression approach employed is the ARDL method. The findings indicate that the currency rate and inflation have a negative influence on Ghana's economic development, but foreign direct investment has a positive and considerable impact on Ghana's economic growth. Because exchange rate volatility has almost total self-determination, unregulated interventions may not only exacerbate volatility but also be expensive in terms of productivity and welfare. Improving central bank exchange rate forecasting and modeling, as well as incorporating the impact of asset prices into national monetary policy, may improve the functioning and transparency of the foreign currency market. As a consequence, the thesis proposes that Ghana's present flexible exchange rate be backed by more explicit policies aimed at attracting FDI inflows.

Keywords**:** Exchange rate, inflation, Foreign Direct Investment, fluctuation

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Özet

Bu tez, döviz kurlarının ve DYY'nin 1990'dan 2020'ye kadar Gana ekonomisi üzerindeki etkisini incelemektedir. Bir ekonominin mali durumu, döviz kurundaki dalgalanmaların bir sonucu olarak tehlikeye girebilir. Döviz piyasasının değerindeki değişikliklerin tüketici, şirket ve devlet fiyatlandırması üzerinde etkisi olabilir. Benita ve Lauterbach (2004), döviz kurlarındaki değişikliklerin fiyat istikrarını, şirket karlılığını ve ülke istikrarını etkileyen önemli ekonomik etkileri olduğunu kanıtladı. Borsa, bir ülkenin daha geniş finansal sistemi üzerindeki döviz kuru değişimlerinin etkisine karşı özellikle savunmasızdır. Gana, küçük, açık bir ekonominin harika bir örneğidir. Çok çeşitli ülkelerle uluslararası ticaret yaptığı için para biriminin değeri diğer ülke para birimlerine göre dalgalanmaktadır. Bugün büyüyen bir pazar olarak kabul edilen Gana Menkul Kıymetler Borsası, 1963 tarihli Şirketler Kanunu'nun garanti ile sınırlı özel bir işletme için kurallarına uygun olarak Temmuz 1989'da kurulmuştur. ADF birim kök testi, değişken durağanlık testi için kullanılır. Kullanılan regresyon yaklaşımı ARDL yöntemidir. Bulgular, döviz kuru ve enflasyonun Gana'nın ekonomik gelişimi üzerinde olumsuz bir etkiye sahip olduğunu, ancak doğrudan yabancı yatırımın Gana'nın ekonomik büyümesi üzerinde olumlu ve önemli bir etkiye sahip olduğunu göstermektedir. Döviz kuru oynaklığı neredeyse tamamen kendi kaderini tayin ettiğinden, düzenlenmemiş müdahaleler yalnızca oynaklığı şiddetlendirmekle kalmaz, aynı zamanda üretkenlik ve refah açısından da pahalı olabilir. Merkez bankası döviz kuru tahmini ve modellemesinin iyileştirilmesi ve varlık fiyatlarının etkisinin ulusal para politikasına dahil edilmesi, döviz piyasasının işleyişini ve şeffaflığını geliştirebilir. Sonuç olarak tez, Gana'nın mevcut esnek döviz kurunun doğrudan yabancı sermaye girişlerini çekmeyi amaçlayan daha açık politikalarla desteklenmesini önermektedir.

Anahtar Kelimeler: Döviz kuru, enflasyon, Doğrudan Yabancı Yatırım, dalgalanma

Table of Contents

CHARPTER III

CHARPTER IV

CHARPTER V

List of Tables

List of Figures

Abbreviations

ADF: Augmented Dickey-Fuller

ARDL: Auto Regressive Distributed Lag

ECM: Error correction model

ER: Exchange rate

FEER: Fundamental Equilibrium Exchange Rate

FDI: Foreign direct investment

GDP: Gross Domestic Product

INF: Inflation

IFE: International Fisher Effect

IMF: International Monetary Fund

IRP: Interest Rate Parity

OLS: ordinary least square

PPP: Purchasing power parity

REER: Real Effective Exchange Rate

CUSUM: Cumulative sums of recursive residuals.

FINSAP: Financial sector adjustment programmed

VECM: Vector error correction models

CPI: Consumer price index

ERP: Economy recovery program

CHAPTER I

Introduction

The financial condition of an economy might be vulnerable due to variations in its foreign conversion rate. Changes in terms of the worth of foreign monetary unit market may have a result on the prices paid by consumers, businesses, and the government. Benita and Lauterbach (2004) demonstrated that fluctuations in currency trade rates entail significant economic consequences that have an impact on price stability, the moneymaking potential of firms, and the stability of countries. The financial market is particularly susceptible to the effects that fluctuations in exchange rates have on a nation's overall financial system. However, an assessment of the data that is currently accessible demonstrates that different scholars have different perspectives on the question of whether or not fluctuations in foreign exchange rates impact the volatility of stock markets (Tonks, and Taylor 1989; Young, 1972 Frank and Solnik, 1987).The African Money meltdowns, the introduction of an unstable rate of currency conversion in early 1970s, and the reform of the monetary exchange market in the early 1990s were the three events that spurred financial economists to investigate the connection within the context of these two markets (Mishra, 2004). In addition, the globalization of financial segments has led to the movement of enormous quantities of money from one country to another, as well as the cross-listing of stocks in many nations. Because of this, investors and businesses now have a greater interest in the unstable nature of currency exchange rates and the influence that this volatility has on stock market uncertainty. The recognition a floating currency trade rate lowers the extent to which export markets are competitive and has a damaging influence on the local financial markets (Yucel and Kurt, 2003). However, it could have a favorable influence on the stock market for countries that rely heavily on imports since it will cut input prices.

Ghana is a great illustration of an open and small economy. Because it participates in international commerce with a variety of nations, it is subject to fluctuations in terms of the value of its currency in comparison to other nations' money. The Ghana Stock Exchange, which is now considered to become a market that is expanding, was founded in July 1989 as in accordance with the regulations for a personal corporation restricted by means of a guarantee of the Companies Code, 1963. It increased from 1.8 million shares at the close of 1991 to its highest price ever in terms of the turnover of

stocks quantity in the year 1997, when it registered 125.63 million shares. Following such events, the volume continued to decrease, going from 125.63 million in 1997 to 91.45 million in 1998, then from 49.57 million in 1999 to 30.72 million in 2000. The number of copies sold rose to 55.3 million in 2001, then dropped to increased slightly to 96.33 million in 2003, from 44.12 million in 2002, and then reached 104.35 million in 2004. At the end of 2003, the All-Share Index had the best return of any stock market in the world, having the highest yield on any market in the world (154.7%; 142.7% in US dollars) (GSE Fact Book, 2005). A performance like that causes sales growth index to remain unstable, exhibiting the odd surge as well as infrequent dips. However, the actual data on the result of the volatility of the external currency market on the stock market is, for the most part, conflicting. These are the ones that have been competing with the industrialized economies. Mishra (2004) acknowledged that there is no widespread conceptual agreement about the relationship between currency rate and stock prices. However, Solnik (2000) argues that the stock market and the currency of the country in which it is traded have a negative correlation.

It is generally accepted that the transparency of a nation's financial system contributes to the volatile nature of its markets. Ghana is a paradigmatic example of a free market that is actively involved in the conduct of international economic transactions. In addition, as a consequence of globalization, emerging countries are becoming more integrated with established economies, which have led to an increase in the import and export activity. In this way, Ghana is not an exception. When you look at the history of the country's currency exchange rates, you observe that they changed a lot over time.

Persistent exchange rate variations, which are termed exchange rate volatility, have dominated contemporary literature in international finance due to the consequences that it has on emerging countries. Regarding the evolution of exchange rate swings is astounding. both in advanced and emerging economies. This is largely due to the impact that exchange rate fluctuations have had on exports (Wang & Barrett, 2007; Vieira & MacDonald, 2016; Assery & Peel, 1991; Arize, Osang, & Slottje, 2000 Bahmani-Oskooee & Hegerty, 2007;) employment growth (Belke & Setzer, 2003; Bel (Danne, 2006; Holland et al. 2011; LevyYeyati & Sturzenegger, 2003; Mundell, 1995).

The Financial Sector Adjustment Programme (FINSAP), part of the Economic Recovery Programme, led to Ghana's abandonment of the free-floating system preferred over regulated exchange rates that had been in place since the 1980s (ERP). This was one of the most significant changes to take place in the country's financial sector. This transition amongst a number of other things was created, based on the idea that more malleable currency exchange rates will prevent the country from its boom-and-bust cycle and direct it into a growth trajectory. Exchange rate fluctuations have a trickle-down effect on consumer pricing, trade terms, trade volumes, and investment. This adjustment was implemented with the assumption that currency rate flexibility will prevent the cycle of bust and boom, as well as guide the nation's economy in the direction of growth.

Since the 1980s, when a flexible exchange rate system was implemented, the Ghana Cedi has experienced a depreciation with relation to key currencies, most notably the United States Dollar (US$). This depreciation has not been consistent, however, as the Ghana Cedi has experienced at least some degree of stability between the years of 2002 and 2007. On July 1, 2007, Ghana redenominated her currency, and one United States dollar was thereafter equivalent to 93 pesewas. Over time, as a result of this decision, the value of the Cedi decreased, and by July's end in 2009, one United States dollar could be purchased for 1.49 Ghana cedis. In recent times, the value of the Cedi has been very unstable, and between January 2014 and September 2014, it dropped by a whopping 44.65%. This amount of depreciation may have had a role in the acceleration of the rate of increase in consumer prices, which reached 17% in December of 2014, up from 13.8% in January of the same year. The expansion of the nation's gross domestic product, which reached 15.0 percent in 2011, fell to 8.8 percent the next year, and then to 7.6 percent in 2013. In point of fact, the pace of development of the GDP in 2014 was 4.2%, which was much lower than the revised original objective of 7.1%.

Although there is some circumstantial evidence that links the fluctuation in the prices of currencies to the instability of the macro economy, there hasn’t been a lot of work done to analyze the causes of this volatility and its influence on the stability of the internal and external environments of the economy. In addition, the arguments that surround the shifts in the currency rate used in Ghana are solely drawn from economic concepts in the public sphere, which include very minimal empirical or theoretical

content. This research investigates the volatility of the currency rate causes and its influence on economic results with the goal by guiding strategy and aimed at keeping a stable currency. An empirical problem is trying to figure out what causes exchange rates to change and how they change.

This research utilizes yearly data from 1980 to 2013 to conduct a comprehensive analysis of the Ghana's economic progress and the factors that generate real exchange rate volatility. The study covers the period from 1980 to 2013.

The findings of the test for co-integration indicate the existence of an ongoing link between the variables, which suggests that when a shock hits the economy, generating instantaneous disequilibrium, Real exchange rates fluctuate to regain balance., although slowly. According to the findings of the vector error correction model (VECM), in the short term, performance is the only factor that substantially causes variations in the market for currency exchange. The outcomes of the normalized co-integrating equation, on the other hand, show that fluctuation is highly impacted by government spending, the flow of currency, conditions of commerce, foreign direct investment, and production. The Decompositions of variations demonstrate that the fluctuation of the currency market is self-driven. In addition, foreign direct investment (FDI) and production are obvious elements that explain the bulk of the predicted inaccuracy of volatility in comparison to other components. We find a U-shaped link between actual exchange rate, fluctuations and long-term expansion, which suggests that there are situations in which volatility does not inhibit growth.

The volatility of exchange rates is a significant contributor to the dangers that are present in the financial sector. When there are significant shifts in terms of the value of one particular currency compared to another, it may be harmful to both global commerce and equity. It has been argued that the increased volatility of real interest rates can be traced back to the 1973 breakdown of the Bretton Woods Institution, as reported by Baig (2001) and Hviding et al. (2004). Because of this event, floating exchange rates, which had big impacts on the expansion of the economy, the flow of money, and the way business was done in every corner of the globe.

The fluctuations in the value of the Forex market rate might be caused by a wide variety of causes. According to Froot and Rogoff (1991), when there is a rise in the amount that the government consumes, there is a tendency for there to be a relative price increase of non-tradable. This is because non-tradable make up a major fraction

of the total amount that the government spends. Increases in government consumption are connected with real appreciation, according to De Gregorio et al. (1994), who also enable the notion.

According to Stancik (2007), the cause of the volatility in exchange rates might result from a combination of factors among them; he provided an overview of the local and foreign money supply, inflation, the level of production, and the system governing the exchange rate. The remaining factors include the rates of interest, the degree to which an economy is open for business, and the autonomy of its central bank. In a separate but similar research on the factors that influence the volatility of currency rates, Juthathip (2009) proposed that there were five basic variables with regard to the long-term, were responsible for determining the real exchange rate. Productivity differentials, openness, and conditions of commerce were two of the five basic factors that were recognized as having a medium-to long-term impact. The rest is made up of net assets that are held in other countries and government spending.

One simply cannot overstate the significance of maintaining a steady currency exchange rate. It links local and international markets for products and assets, in addition to acting as a comparative cost that indicates the value of one currency expressed in comparison to another currency. In addition to this, it is an indicator of how internationally competitive a country is in the global market. According to the opinion of Williamson (1994), the estimation of the degree of fluctuation and mismatch in exchange rates continues to be a difficult empirical issue in the field of macroeconomics. He also said that there is no simple response to the inquiry that was asked of what factors affect the exchange rate at the point of equilibrium.

Economists have claimed that a pricing system that does not account for relative resource scarcity is one of the primary causes of a bad economic front in less advance nations (LDCs), particularly those in Sub-Saharan Africa. This is particularly the case in countries in the LDCs. Incorrect relative pricing of tradable and non-tradable, induced by wrong trade and exchange rate policies, has been cited by several economists as a potential cause of economic stagnation. In modest open economies like those found in Sub-Saharan Africa, the application of policies regarding the currency rate that are inappropriate has a detrimental impact on It is important to take

into account a variety of elements, including but not limited to exports, imports, investments, the transfer of technology, and, ultimately, economic progress. The reality that practically all reform programs implemented in LDCs by the World Bank and the International Monetary Fund involve policy reform regarding the currency rate changes as a component of the overall set serves to illustrate the significance of a realistic rate of currency exchange.

Recent empirical research suggests that a misalignment of real exchange rates is adversely associated with expansion of the economy.

Utilization of cross-national data allows Edwards (1989a, 1988) to arrive at the conclusion that a mismatch in the actual currency trade rate has a considerably bad influence on the pace of expansion in a representative sample of 18 LDCs. Also employing cross-national statistics from 24 LDCs, Cottani et al. (1990) arrive at the conclusion that a misaligned rate of actual exchange is adversely connected to the rates of increase in income distributed per person, exports, agricultural production, and net investment. They discover that real exchange rate discrepancy is accurately associated with the ratio of production to additional capital (1COR), which is a sign the effectiveness of the use of capital declines with real exchange rate misalignment. However, exchange rate misalignment is favorably connected to 1COR. Instability in real exchange rate misalignment, according to their findings, is also adversely associated with all metrics of economic performance.

Ghura and Grennes (1992) use data from 33 countries in Sub-Saharan Africa and a plan that spans many countries to arrive at their conclusion the fact that the real exchange rate is misaligned and that this instability has a detrimental impact on the growth rate of real per capita income, as well as exports and agricultural production, as well as investment. Their research shows that these factors all contribute to slower sustainable development.

The study that was just discussed has a few elements in common with other studies. In the first place, all forms of economic regress measurement success are only regress ways of measuring the genuine mismatch of currency rates, given that factors other than the mismatch of real exchange rates may have an effect on the economic performance of LDCs, it is natural to wonder how strong the real exchange rate misalignment truly is correlated with a negative link among economic performance and the real exchange rate. This is a question that needs to be asked because

misalignment of the real exchange rate isn't the only factor that might affect economic performance in LDCs; other factors can play a role as well. It is possible that the real misalignment of exchange rates is accounting for the effect of missing factors with which it is related in such calculations. This would be the case if the actual exchange rate misalignment was capturing the influence of factors that were left out of the equation. If this is the case, then these estimates have a good chance of being affected by missing variable bias. Second, each of the studies uses data collected from more than one country. It is possible that differences within the framework of economies that are unrelated to the real mismatch of the exchange rate are to blame for explaining cross-country differences in economic outcomes. One possible explanation for these differences is that the real mismatch of the exchange rate has led to these differences. Cross-national investigations of the relationship between exchange rate misalignment and economic performance need to be supplemented with time series data so that researchers can have more faith in the estimated correlations between two or more variables. This will allow researchers to have more confidence in the results of the correlation analyses. Through these studies, an attempt is being made to determine whether or not there is a connection between the two. These studies need to be carried out in order to have an understanding of the effect that changes in currency rates have on developing nations like Ghana.

Third, a single equation model was used in all of the research that was discussed before. There is a possibility that the misalignment of real exchange rates both impacts and is impacted by the pace of economic growth. Estimates of coefficients derived from models with a single equation have a greater risk of suffering from simultaneous equation bias as a result these single equation models don't explain to the reader how they work. via which actual exchange rate misalignment impacts economic development. This is true even if the computed coefficients are objective and robust. There is a chance that a misalignment in the actual value of the exchange rate will hurt economic growth because of how it affects the dividing up resources into marketable and non-marketable categories, how it affects investment, or how it affects a number of other things.

Single-equation models are unable to provide any insight into the existence of these conduits. It is possible that using multiple equation models will be required in order to explore the connection between a country's economic success and its policies

concerning its currency rate in LDCs. This is important so that we can figure out how the way exchange rates aren't aligned affects economic growth.

The administration of exchange rates is crucial to the growth of economies all over the world, but especially in Ghana, where poor management of exchange rates has not only led to economic instability but also to political instability. According to Bhasin (2004), the fact that the economy of Ghana is so reliant on imports of raw materials, capital goods, and consumer products makes it absolutely vital in order for the nation to preserve a stable currency trade rate in order to maintain price stability. A stable currency trade rate would in general be good for family incomes and choices about what to spend money on. It would also be good for the trade balance and the government's fiscal and monetary policies.

Because it has such a direct bearing on an economy's ability to compete successfully on the global stage, Ghana's real currency rate is by far the most significant factor affecting economic policy (Alagidede& Ibrahim, 2017). Recent the worth of the trade rate in its true form fluctuating has prompted the issue of whether the trend would have a positive or negative influence on the economy of Ghana. This topic has been raised because of the recent instability in the actual worth of the trade rate. The Bank of Ghana, which serves as the nation's central bank, is in charge of overseeing the country's currency exchange rate management. In spite of the fact that between 1967 and 1971 there was a short effort at liberalizing the commerce as well as the exchange rate systems, this was stopped, and Ghana reverted to a system with a constant rate of exchange.

The nature of exchange rate regulation was modified when the Economic Reform Programmed (ERP) was implemented in 1983. As a result, the nation finally liberalized into a flexible rate system. However, throughout this time period a significant devaluation occurred in the actual exchange rate. Even though the Ghanaian government has tried to keep the exchange rate of the country currency stable (Amoah et al. 2017; Mensah et al. 2017), the value of the Ghanaian cedi has been steadily going down (Amoah et al. 2017; Mensah et al. 2017).

Previous investigations of the connection that exists among fluctuations in trade rates and economic development have uncovered a range of perspectives on this contentious

subject. According to the findings of Aliyu (2009), a rise in the worth of the money as a whole rate has a beneficial effect on Nigeria's actual economic development. In Iran, Razazadehkarsalari et al. (2011) found that devaluation of the currency has positive and significant effects on real GDP during periods of stagnation and low prices, but during periods of high prices, devaluation of the currency trade rate has insignificant impact on real GDP. This finding was based on the observation that during periods of high prices, devaluation of the rate of currency exchange has no impact on the actual GDP. David et al. (2010) looked into how alterations made to the currency's exchange rate value affect the Nigerian industrial sector.

They used multiple regression econometric methods, which led them to discover that there is a potentially harmful association among change in the cash trade rate and the performance of the manufacturing sector. According to the findings of comparative research that Jin (2008) carried out, a rise in the currency trade rate results in a gain in GDP in Russia, whereas it leads to a decrease in GDP in Japan and China.

According to Abeysinghe and Yeok's research from 1998, a falling exchange rate encourages exports while simultaneously decreasing imports, and an appreciating exchange rate discourages exports while simultaneously promoting imports. The findings of Aizenman (1992) and Goldberg (1993) indicate that a rise in the volatility of exchange rates is connected with a fall in the amount of investment. According to Coleman and Agyire-Tetteh (2008), fluctuations, regardless of whether they are positive or negative, are undesirable because They often make foreign transactions riskier and more unclear, which discourages the flow of trade and investment. This is true even if the fluctuations are positive. A study of the relevant research reveals that there are no studies that relate a, correlation were found between shifts in the value of the cedi and economic growth in Ghana. Alagidede and Ibrahim (2017) conducted the most recent research on the topic, and their focus was concerning the reasons and outcomes of currency rate volatility in Ghana. This indicates that there is a need for more study about the impact that instability in the currency exchange rates have on Ghana's economic development and the factors that contribute to those effects. In addition, it is possible to deduce from the debate that has just taken place that the literature on the topic of the establish a connection among unstable currency rates and sustainable growth development is far from reaching a definitive conclusion. In addition, currency rate volatility may be decreased by hedging against risk and uncertainty in foreign transactions by using futures or forward contracts. This can be

done in order to protect against any negative outcomes.
Since there isn't much of a future or forwards market in Ghana or the rest of the Sub-Saharan area, there is less chance of making money by hedging against the currency rate's unpredictable behavior.

The worth of single cash expressed in relation of cash is referred to as the exchange rate by Mishkin (2007). It has an impact on the economy as well as the quality of life in a country. The reason for this is that, for example, when the value of the Ghanaian cedi increases in comparison to that of other currencies, the price of products purchased in other countries decreases for Ghanaians but the price of goods purchased in Ghana rises. There are primarily two different kinds of exchange rates. There are two types of transactions: spot transactions, which use the current exchange rate; and future transactions (which use the currency conversion rate applicable to the future transaction). When the value of a currency goes up, this phenomenon is known as appreciation, and when the value goes down, this phenomenon is known as depreciation.
The relative prices of local and international products are significantly impacted by exchange rates, making them an essential economic factor (Mishkin, 2007). In the foreign currency market, the interaction between buyer and seller demand and supply may help to establish exchange rates. These kinds of supply and demand situations are mostly driven by whether or not the fundamental balance of payments for the nation is whether there is a surplus or a deficit (Mishkin, 2007). Furthermore, according to the purchasing power parity (PPP) concept, the exchange rates of two currencies will adapt to reflect changes in the general price level if there is a change in either currency's value of both nations progressively over time. The related price levels, customs duties and import quotas, priorities for home commodities compare to those from other countries, and levels of productivity all influence the rate at which currency is traded over the deep rooted. The rate of currency exchange is related to the national pricing level and import demand in a way that is inversely proportional to the exchange rate, whereas trade obstacles, export demand, and productivity are proportionally related to the exchange rate in a positive way (Mishkin, 2007). Exchange rates have the ability to remain stable at a predefined level or they may move freely to adapt to substitute in market command. This has the potential to either favorably or adversely

affect the productivity of the country. The explanation for this is the influence that currency exchange rates have on pricing.

As soon as the worth of the Ghana cedi’s goes up a comparison to the cash of other countries, this makes Ghana's net exports go down.
This will lead to a decrease in total overall request. In contrast, the value of the Ghana cedi falling will have an effect in the other direction; it will result in an increase in net exports, which will lead to an improvement in overall demand.
The connection between the pace of increase in GDP and the value of the currency exchange produces contradictory findings. As can be seen in the previous example, this connection may be positive, negative, or none at all. For instance, in his paper titled "The Real Exchange Rate and Economic Growth: Theory and Evidence," published in 1998, Rodrik asserts that undervaluation, which results in a high rate of exchange, encourages the expansion of an existing economy. That is to say, the pace of GDP growth and the exchange rate have a positive correlation with one another, and this is something that is particularly true for economies that are growing. This demonstrates that there is a good connection among the exchange rate and the GDP development rate, as the distortions that prevent underdeveloped nations from converging have a disproportionately negative impact on the traded commodities. Countries such as Tanzania, Uganda, Taiwan, China, India and South Korea were among those whose data were incorporated in his study as sources of evidence.

A study titled "Exchange Rates and Economic Growth in Kenya: An Econometric Analysis" was carried out by McPherson and colleagues in 1998. Using data spanning the years 1970 to 1996, they aimed to evaluate the type of connection that may be found allying the currency exchange rate and the pace of sustainable expansion in Kenya. They investigated the potential for both a direct and an indirect connection with respect to the official and actual exchange rates and the expansion of the GDP. They did this in three different ways: inside a thoroughly stated (but modest) macroeconomic model; as an estimate of an instrumental variable using a single equation, as well as in the form of a vector auto regression model. The first method was done within the confines of a macroeconomic model that is both fully stated and relatively simple. The findings of the estimations using the three distinct parameters indicated because there was not enough proof to support the claim of a paramount

direct tie in the midst of fluctuations in the exchange rate and the expansion of GDP. Researchers Hadad et al. (2010) investigated the question, "Can real exchange rate undervaluation increase exports and development in poor countries?" They came to a positive verdict, but it did not last very long. The debates that are now taking place the value of the Chinese currency are an example of the debate surrounding exchange-rate policy. has the potential to spark. This article claims that although a controlled real undervaluation might boost nationwide competition, it is difficult to maintain following a crisis context politically as well as economically. The argument is based on the fact which controlled actual undervaluation can increase nationwide competition. It states that the only nations that may benefit from a true undervaluation are those with low incomes Moreover, only in the far future.

Research conducted by Chen (2012) titled "Real exchange rate and economic growth: Evidence from Chinese province data (1992–2008)" In his research, he examined what impact the real exchange rate has on the economy development and how it contributes to the coming together of several growth rates seen throughout China's many regions. He discovered conditional convergence both among upland and coastal provinces. by using data from a total of 28 Chinese provinces for the period of 1992–2008 using dynamic panel data estimate. The findings that were provided here lend credence to the proposition that an increase in the provinces' actual rates of exchange leads to a favorable impact on economic expansion.

Research that was conducted by Tarawalie (2010) was titled "Real exchange rate behavior and economic growth: evidence from Sierra Leone." The fundamental objective of this research was to investigate the connection that exists between the actual effective exchange rate and several other profitable variables, in addition to the rate at which economic development is occurring in Sierra Leone. To get started, a conceptual framework was constructed with the intention of determining the components that are responsible for the genuine effective exchange rate. Following that, utilizing quarterly data and up-to-date econometric methodologies, an investigation of the connection between the effective exchange rate and economic development was done so that we could get a better understanding. To further probe

the link between the real exchange rate and economic growth, a bivariate Granger causality test is used as a central feature of the methodology. According to the empirical studies, there exists a long-term statistically significant association between the effective exchange rate and economic growth. There was strong evidence that the real effective exchange rate was the driver of economic growth, and the results revealed that monetary policy was much more successful than fiscal policy. In addition, the findings suggested that the real effective exchange rate was the cause of economic development. In addition, the data revealed that the primary determinants influencing Sierra Leone's real exchange rate were terms of trade, exchange rate depreciation, investment as a percentage of GDP, and having an excessive amount of domestic credit. All of these components were linked to one another.

Evidence from Bangladesh and elsewhere shows that all a government needs to do to maintain public confidence in its currency is to take precautions to keep it strong and ensure that it is fully convertible. It is possible to achieve this goal if there is strong political and economic will, and if this will is reinforced by an appropriate reserve of foreign exchange, a ceiling on interest rates, and a guarantee that the currency may be converted.

The term "foreign direct investment," or "FDI," refers to money that is invested from outside the country and goes directly into the economy.

Policymakers have a general view that FDI boosts host country productivity and promotes growth. This assumption is supported by empirical evidence. Investigations of FDI and its relationship to economic expansion is plentiful. The researchers utilized a variety of approaches, and their conclusions were inconsistent; yet, some of them discovered that FDI give positively to sustainable expansion. One study that examines how FDI influence sustainable growth in emerging nations is Balasubramanyam et al. (1996). He finds, through the use OLS regressions and cross-sectional data that FDI give to the sustainable expansion of the host nation, that employ an approach geared on encouraging exports but does not have this impact on countries' economic growth employ an import substitution strategy. Olofsdotter (1998) offers an analysis that is quite similar. She finds, through the use that a growth in the stock of FDI is supported by cross-sectional data has a positive relationship to growth and that this stronger

impact on host nations that possess greater institutional capacity. This capability is as determined by the degree to which a country protects its citizens' property rights and its bureaucratic efficiency.

Statistics for eleven developing countries in East Asia and Latin America are used by Zhang. Zhang (2001) uses cointegration and Granger causality analyses to show that FDI promotes economic growth in five out of seven case studies. However, the trade regime and macroeconomic stability of the host country are critical factors. Therefore, the purpose of this study is to examine the connections between shifts in foreign exchange rates, FDI, and GDP growth in Ghana.

Statement of the Problem

Rates of expansion of emerging nations, in addition to Ghana, having underwhelming up to the implementation of economic recovery programs (ERP). For instance, throughout the 1970s, the nation saw a growth rate of around 2% on average. The decade of the 1980s saw widespread adoption of liberalization and adjustment policies, which resulted in modest development in the industrial and agricultural sectors. The Gross Domestic Product increased annually of 5% over the whole of the period 1984-1988. In addition to this, the nation is struggling with a high inflation rate. In the late 1970s, Ghana faced a significant challenge in the form of rising prices due to inflation. Inflation reached an all-time high of 117% in 1977, down from its level of 56% in 1976, and it concluded the decade at 54%. Despite the fact that GDP growth was negative in both 1975 and 1976 (-12% and -4%, respectively), the money supply increased by 25% and 44%, respectively, in both years, making this a monetary phenomenon. Once again, inflation reached a record high of 123% in 1983. The principal causes of the increase in inflation were the Sahelian drought and the widespread bush fires that destroyed agricultural products, drastically reducing the availability of food and other goods. This low performance can be attributable to a number of different issues. It is believed that policy induces distortions in the economy, which is one of the primary reasons. It was therefore believed that these distortions could be eliminated by implementing appropriate policies regarding exchange rates, fiscal policy, fiscal policy, trade policy, and settlement policies. This

would lead to a structure that would help the parts of the economy that make things. Addressing this issue, this thesis will assist the government in better managing the exchange rate and inflation crisis that it is now facing.

Purpose of the Study

There are a number of possible explanations due to the bad results (slow GDP growth)). It is widely accepted that policy-induced distortions in the economy are one of the primary causes. The research aims to determine whether the gradual expansion of GDP is meaningful, and if the current downward trend may be reversed by the use of suitable policies concerning the exchange rate. Academics need to do research in this area to ascertain if the shift in exchange rate policy has contributed to the expansion of Ghana's gross domestic product. In the end, this will help develop research that can contribute something really novel to what is already known about the challenge of boosting GDP growth. Since the IMF Economic Recovery Programmed was introduced in 1983, the management of the currency rate and the liberalization of trade have been top priorities for many governments in Ghana. Not only that, but most academic studies on the impact of exchange rate policy on GDP development in Ghana have focused only on the fixed exchange rate regime or a relatively limited period of time during the recovery program. This research spans a lengthier period of time after the changes, which is to say, from before to after (1990-2020).

Because of this study, government officials in Ghana will have a deeper understanding of how the country's currency exchange rate works in the setting of the economy.

Research Questions

What part does the rate of currency exchange have in the economy of Ghana?

What kind of impact does FDI possess with regards to progress of the economy in Ghana?

What is the connection allying the exchange rate, FDI, and the expansion of the Ghanaian providence?

Research Hypothesis

This presumption serves as the foundation for the formulation of the study subject. The research's goals lead to the creation of hypotheses, which will be tested using more advanced statistical analysis tests.

Null Hypothesis

Ho: There is no link between foreign direct investment and economic growth.

H1: There is a link between Foreign Direct Investment and economic growth.

Ho: There is no relation between exchange rate & economic development

H1: There is affiliation between exchange rate & economic development

Ho: There is no correlation with Inflation and economic growth.

H1: There is a link between inflation and economic development

Significance of the Research

The value of a single currency, stated compared to a different currency or set of currencies is commonly known as an exchange rate. Exchange rates are an essential economic element, particularly for countries like Ghana that are actively involved in international commerce while having relatively open economies. Changes with respect on the basis of the worth of the currency exchange rate may affect choices made by people, corporations, and even the government. All of this has an effect on the amount of economic activity, in addition to having an effect on inflation and the balance of payments.

There are a few distinct metrics that may be used to evaluate currency exchange rates. Over the course of these many years, there have also been several operational configurations for the purpose of calculating the Ghana exchange rate.

This study is vital to the people and government of Ghana in order to better comprehend the measure of the exchange rate in the economy.

Limitation

This study examines the economy of Ghana throughout the period from 1990 to 2020. One major limitation is that despite research are often done on previous research; the period 1990 is approximately thirty-two years, it can't be extended before 1990 depending on the availability of data. Research done on the effect of FDI on the sustainable development of Ghana is found to be inconclusive. Some researchers suggest that FDI positively affects sustainable development while other suggests that FDI negatively affect sustainable development and some research shows no relation. Moreover, the application of the ARDL model in this research has some limitations, one major limitation is that the ARDL model, ARDL models' dynamics will approximate this trend rather than representing "actual" dynamics if the data exhibits a stochastic (random) trend.. Additionally, this research will only look at a restricted number of economic variables. This is because the study will only concentrate on the influence that the exchange rate and FDI have had on the Ghanaian economy.

Definition of terms

Exchange rate: the speed with which one currency is used may be obtained in exchange term "for another" is referring to the "exchange rate between the two currencies. To put it another way, the exchange rate is the cost of one country's currency compared to that of another country's currency. For instance, if the exchange rate between the US dollar (USD) and the Japanese yen (JPY) is 120 yen per dollar, then one US dollar may be exchanged for 120 yen in international currency markets. This is because the USD and JPY both use the Japanese yen as their primary currency. There are two components that make up an exchange rate: a base currency and a counter currency. Because of the significance of the U.S. dollar's role as a reserve currency, the USD is often used as the base currency in currency exchange rates, while the local currency serves as the counter currency. The only exceptions to this rule are

the Euro and the currencies of the Commonwealth, such as the British Pound, the Australian Dollar, and the New Zealand Dollar, which all use their home currencies as their base currencies.

GDP growth: annual percentage increase in GDP measured in market prices and based on constant local currency levels all monetary amounts used in calculating the aggregates are in constant 2010 U.S. dollars. The gross domestic product (GDP) is calculated by adding up all of the product taxes and subtracting all of the subsidies that aren't included in the value of the items. GDP is the total amount of gross value created by all resident producers in the economy. It is computed without making any deductions for things like the depreciation of manufactured assets or the exhaustion and deterioration of natural resources.

places where a significant amount of economic activity is not reported. Estimating household outputs generated for home use, sales in informal marketplaces, barter exchanges, and illegal or purposely unreported activities are all necessary components for constructing a comprehensive picture of the economy. The competence and approaches used by those responsible for generating the statistics determine the extent to which such estimates are reliable and comprehensive. The rebasing of national accounts may result in interruptions in series, which can impair the consistency of data over time. This can also have an effect on the growth rate that is calculated for an economy. When nations rebase their national accounts, the weights that are allocated to the different components are revised so that they more accurately represent the patterns of production or uses of output in the modern economy. The new base year should be one in which the economy operates normally; that is, it should be a year in which there are no significant shocks or distortions. There are still several emerging nations that have not updated their national accounting systems in quite some time. When calculating implicit price and volume weights, using an older base year might lead to misleading results since these weights lose their relevance and usefulness with time. In order to get a comparable series of constant price data for calculating aggregates, the World Bank rescales GDP and value added by industrial origin to a common reference year. This allows for more accurate comparisons between the two sets of data. Because rescaling changes the implicit weights that are used to make regional and income group aggregates, you can't compare aggregate growth rates from different editions with different base years.

FDI: The term "foreign direct investment," or "FDI," refers to a category of international investment that reflects the objective of obtaining a long-term interest in an enterprise resident in another economy by an investor in one economy. This objective is reflected by the term "foreign direct investment."
The existence of a lasting interest is indicative of the existence of a long-term connection between the investor and the firm, as well as the investor's capacity to exert a considerable amount of influence over the management of the enterprise. When a direct investor controls 10% or more of the voting power on the board of directors (for an incorporated firm) or the equivalent of that amount of voting power in another entity, this kind of interest is technically considered to exist (for an unincorporated firm).

FDI, or foreign direct investment, may be thought of as an alternative economic strategy that is taken on by businesses that either invest to build up a new factory or office, or alternatively, buy the existing assets of a foreign organization. These businesses aim to supplement or replace international commerce by manufacturing (and often selling) products and services in countries other than the ones in which they were first formed.

Stock Exchange: The purchase of stocks, bonds, and several other types of assets may be done on a stock exchange, which is a kind of market. It offers a platform for firms to sell stocks, and it allows investors to trade those stocks with each other inside a regulated arena that seeks to make everything as efficient and transparent as possible. Companies may sell stocks to investors, and investors can trade stocks with each other.

International commerce: The business of purchasing and selling products and services between other countries is referred to as international commerce. By engaging in international trade, sovereign nations are able to capitalize on the comparative advantages offered by their home country in order to acquire and sell goods in other locations. A country's closeness to certain natural resources, such as Canada's timber or Portugal's seafood, or its workforce's high level of education and technological expertise, may be a source of competitive advantage. This is the case in Chile, which boasts one of the world's longest coastlines (along with South Korea, Sweden, and Israel).

It is essential that there be global regulatory organizations in operation in order to achieve some degree of legal consistency given the large number of distinct nations that are involved in the international commercial system, each of which has its own distinct body of sovereign laws. The International Chamber of Commerce (ICC) and the World Trade Organization are the two primary organizations that are in charge of monitoring and regulating international trade (WTO). Despite the fact that there is a distinction between commerce and trade, the World Trade Organization (WTO) does have some role in regulating international business.

CHAPTER II

Literature Review

Introduction

This part of the research will concentrate on two main parts: first, we will talk about the theoretical framework or the theory that our research is based on; and second, we will look at other research to see if there is any empirical analysis on this subject that can assist us in comprehending the connection between the variables that are dependent and those that are independent.

Theoretical Framework

To figure out the purchasing power parity (PPP) between two countries, you can either use the ratio of prices in each country (also called absolute PPP) or the product of the exchange rate during a base period and the ratio of price indices in each country (relative PPP).

The PPP theory is comprised of two definitions and two premises, all of which are related to equilibrium exchange rates. According to one definition, the short-run equilibrium exchange rate is the rate that would prevail in a system in which exchange rates were allowed to float freely (that is, without being controlled). The short-run equilibrium exchange rate is defined as the variable exchange rate that would yield balance of payments equilibrium over a time period, including any cyclical fluctuations in the balance of payments. The long-run equilibrium exchange rate is defined as the fixed exchange rate that would yield balance of payments equilibrium over a time period including any (including those related to business cycles at home and abroad). In addition, the latter definition presupposes that there are no particular measures in place to prevent an imbalance in the balance of payments (e.g., the use of monetary and fiscal restraint or trade and payment restrictions to prevent or suppress a deficit). The notion of the balance of payments that is used is one that is all-encompassing. In most cases, the official settlements or fundamental balance are utilized, as opposed to the current account or trade balance.

The PPP theory asserts two propositions: (1) that the long-run equilibrium exchange rate is either the PPP or the principal determinant of it; and (2) that the short-run

equilibrium exchange rate is a function of the long-run equilibrium exchange rate in the sense that the former variable tends to approach the latter. Both of these assertions are based on the idea that one variable tends to approach the other.

The PPP is not a singular idea but rather is made up of a number of different schools of thought. One might think about classifying these ideas in one of three different ways. To begin, the absolute form of PPP and the relative form of PPP are differentiated from one another. Second, the definition of PPP may include a wide number of product-price or factor-cost measurements in a variety of combinations. Examples (for absolute or relative PPP, respectively) include the GDP price level or the GDP deflator; the cost of living (COL) price level or COL price index, which is the consumer price index (CPI); a wholesale price level or wholesale price index (WPI); and wage rates; unit labor cost (ULC), or unit factor cost (UFC), with the latter three measures available in either absolute-level form or index-number form.

The shape of the f function is the third dimension of any PPP theory that has been developed. The assumption that the short-run equilibrium exchange rate will tend to approach the PPP is at the core of all theories about purchasing power parity (PPP). 3 factors, if any, that are recognized as inhibiting this tendency (and space for which in the function is indicated by the ellipsis) may be either short-run or long-run in nature, with the classification in certain cases depending on one's time horizon. The ellipsis indicates that there is space for these factors in the function. As an example, a potential restricting factor in the short run may be speculation on the exchange market, but a potential component in the long run could be a consistent unidirectional flow of long-term capital.

The Roots of The Theory of Purchasing Power Parity

Cassel (1918, p. 413) coined the word "purchasing power parity," although he published his PPP theory almost three years earlier, using the similar term "theoretical rate of exchange" (1916, p. 64). While many regard Cassel as the inventor of the PPP theory, other observers believe the founders were English economists writing during the so-called Bank Restriction Period (1797–1821), when the pound was floating. They specifically credit Wheatley, who wrote in 1803, with the first thorough

explanation of the idea. Others claim that the hypothesis was predicted much earlier. According to Brisman (1933, p. 72), the PPP hypothesis originally arose in Sweden more than 20 years before the Bank Restriction Period. Einzig (1970, pp. 145–46) attributes the theory's beginnings to Spanish authors of the sixteenth and seventeenth centuries.

Nonetheless, Cassel was the first economist to set PPP inside a systematic framework, establishing it as an operational theory. Cassel was the first to articulate the idea in terms of statistical averages of prices, as observed by Viner (1937, pp. 379–80). Not only did Cassel establish PPP as an operational theory, but he was also the first to scientifically test it, and he was unquestionably the most vocal supporter of PPP. Most notably, Cassel's theoretical analysis and empirical testing of PPP are very comparable to those used in subsequent decades, including the present. As a result, Cassel's contributions, rather than those of previous authors, are the first analysis and implementation of PPP presented in this study. Because Cassel's work is so modern, the focus here is more on how it works than on its history.

Absolute Price Parity

Cassel's PPP theory is appropriately named, because its foundation is the idea that the value of a currency and thus demand for it is fundamentally determined by the amount of goods and services that a unit of the currency can buy in the country of issue, that is, by its internal purchasing power, which is defined as the inverse of the price level for goods and services. When this statement is applied to two nations, the short-run equilibrium exchange rate is the value of one country's currency relative to the others, and the ratio of internal buying capabilities or price levels determines the absolute PPP (PPP). As a consequence, an absolute price parity hypothesis emerges.
The internal purchasing power of a currency is frequently referred to simply as its "purchase power," and in Cassel's early papers, it is referred to as "buying power" or "paying power." The price levels used to calculate the absolute PPP are clearly the general price levels of the nation, reflecting prices of all products and services available for purchase, or, as Cassel puts it, of "the whole mass of commodities sold in the country" (1928a, p. 33). Cassel is clear on this issue. 14 Indeed, he is certain that

only a general price level can accurately reflect a country's buying power and that price metrics confined to traded products (exports and imports) are inadequate.

Cassel does not specifically define the ideal general price level for determining PPP, but the most obvious interpretation would be a price measure of a country's GDP. Cassel was writing before national accounts were formed; hence the idea of GDP was foreign to him. On the other hand, Cassel clearly intends to remove import prices from the metric while including export prices. 16 A currency's buying power must correspond to the country's own output of goods and services. Also, Cassel (1928 b, pp. 7-8 and 10–11) explains what happens when the exchange value of a country's currency falls below (or rises above) the PPP. This causes more (or less) demand for the currency, which leads to more (or less) commodity exports and more (or less) commodity imports.

Cassel's PPP theory is therefore founded on the capacity to utilize money to acquire goods and services in the nation of issuance. As a result, he observes that the theory works best when the short-run equilibrium exchange rate is projected to deviate the least from the PPP under circumstances of unrestricted international commerce. Cassel also says that the theory is correct when trade restrictions are the same on both sides, i.e., when a country can't import or export as much as it wants to.

Cassel's case for absolute price parity has not been overtaken.

18 Both detractors (19) and defenders (20) present the hypothesis in almost identical words to Cassel. "People value currencies largely for what they will purchase and, in unregulated markets, tend to exchange them at rates that approximately indicate their respective buying capacities," Yeager says (1958, p. 516). However, some detractors utilize a reductio ad absurdum to demolish the theory:

In fact, if transportation costs were zero, relative prices of one product could not fluctuate geographically under perfect competition and unrestricted trade without tariffs, quotas, or exchange restrictions. In that situation, the international price ratio of each competitive good... would have to perfectly match the official free exchange rate as a consequence of swift acting competitive arbitrage; and what is true for each and every good must also be true for the average index number of prices.

Under the severe conditions described by Samuelson (and others before him), 22, the current exchange rate, whether freely floating, controlled floating, or pegged, cannot deviate even marginally from the PPP, unless the arbitrage mechanism is flawed. This eliminates the theory's operational substance. Cassel's absolute price parity, on the

other hand, does not depend on the implausible premise that all commodities are traded and without transportation expenses, tariffs, or quantitative constraints. The theory, in particular, admits the existence of nontraded products but observes that the prices of traded and nontraded items are strongly tied through numerous connections, as outlined by Yeager, for example. 23 Although skeptical of PPP, Haberler properly explains its root: "The purchasing-power parity theory is based on the idea that the prices of globally traded goods show how general prices in different countries are related" (1975,p.24).

Although both traded and nontrade products exist, proponents of PPP note that these two groupings are not uniform collections of commodities. "There is never a precise collection of items that can be exported," Cassel observes. Even minor changes in the currency rate may broaden or narrow the range of exportable commodities "(1928a, p. 33). Yeager agrees: "Actually, the border between domestic and globally sold items is a blurred and moving one" (1958, p. 522).

Relative Price Parity

According to Cassel, absolute pricing parity is stated in all of his publications, along with his notion of relative pricing parity. The true rate of currency exchange in the base period is multiplied by Cassel, and it must be within a range that is considered "normal," based on the pace of change in consumer prices among participating countries, the result in the current period is relative, the ideal base period is one in which the currency exchange rate equals the absolute PPP for the present event as compared to the previous one. The question is whether the relative Purchasing Power Parity in the modern era, calculated using exchange rates that are similar to the PPP in its purest form, is equivalent to the absolute PPP determined for this time period for the first time. According to Cassel, the response is yes, only if the developments in the economies since the base era have been primarily monetary in character. Cassel agrees with his detractors in this regard. "The one type of case that would meet the requirement of exact inversely proportional changes in price levels and exchange rates would be a monetary change in one country... that would operate to change all prices and money incomes in that country to an equal degree, while every other element in the situation, in both countries, remained absolutely constant." Viner writes (1937, p.

384). Samuelson (1948, p. 399), Vanek (1962, p. 84), and Stern (1962, p. 84) all explore the scenario of proportional exchange rates and price levels fluctuating without any genuine changes (1973, pp. 144–46).

According to Samuelson, this ideal conclusion, based on money's neutrality, can materialize only in the long term. Real changes will occur in the economies in the near term (and even over time if the ideal circumstances are not met), despite this, the relative PPP idea is not going to work properly. However, if financial changes outnumber actual alterations, relative PPP remains in effect, although as an approximation. Cassel is undoubtedly in this situation.

Utilizing PPP to calculate the level of disequilibrium in a having a variable exchange rate suggests that there is an obstacle. the floating rate from reaching its long-term balance (regarded as the PPP). Speculation is always offered as the reason for disequilibrium in the literature on this topic. However, different writers interpret the idea of conjecture differently.

Cassel (1925) investigated Denmark's and Norway's floating currencies. Using Sweden as a baseline, He determines PPPs and assesses them against exchange rates. (Local currency unit, Swedish currency). The proportion growth in the exchange rate for each nation during 1925 was more than the percentage increase. In the PPP, the currency's outward value has grown more than its intrinsic value.. Cassel stated that "those who believed in the restoration of the gold parity had driven up the currency's external worth through very strong and widespread speculation" (1925 d, p. 57). The cause of this "speculation" was the Danish and Norwegian governments' stated intention of restoring (appreciating) their currencies to the gold parities they previously had.

Both Sweden and the United Kingdom, followed by others, gave up using the gold standard in 1931 and allowed their money to float. Cassel (1932a, pp. 85-87) estimated and compared PPPs for the euro and pound using the US dollar as the baseline period, 1926–28 as the foundation period, and January 1932 as the present era (amount of dollars per local currency unit)). Because the PPP is always higher than the exchange rate, this means that the money is being grossly underpriced. For Cassel, the comparison between countries whose currencies float freely under paper standards and

those whose currencies are pegged to the gold standard is illustrative of a "exaggerated distrust" (represented by the dollar).

Tsiang (1959) suggests that the degree of speculation in the foreign exchange market can be estimated by calculating the amount by which a flexible exchange rate deviates from PPP.

Without embracing the notion that the PPP represents the long-run equilibrium exchange rate, a growing disparity among the PPP and the real exchange rate speculation if it occurs over a short period of time, unless there are changes in "non-speculative factors" (such as non-speculative capital flows and the supply and demand for traded products). Tsiang computes the PPP using WPIs, using 1913 using the year 2000 as the baseline and the dollar as the accepted currency. The examination focuses on the United Kingdom, Norway, and France's post-World War I floating exchange rates.

Due to his refusal to use Exchange rate and PPP comparisons to ascertain whether a currency is overpriced or undervalued, the results of Tsiang's analysis are not analyzed here; only his methodology is of significance. Tsiang's approach uses a price index that is less highly weighted with traded products, therefore employing WPIs to construct the PPPs may have resulted in smaller actual exchange rate deviations from the PPPs and hence less speculation. In fact, Aliber (1962) finds more evidence of "speculation" when he builds PPPs using retail and wholesale pricing indices. Considered countries include the UK, France, Belgium, the Netherlands, and Switzerland.

Empirical Analysis

GDP Growth and Exchange Rate Nexus

The value of one nation's currency expressed in terms of the currency of another nation is referred to as the country's exchange rate. It has an influence on the prices of local items in comparison to those of imported ones as well as how much the external sector participates in global trade. On the other hand, interest rates are regarded as a type of payment for building up financial resources while refraining from

spending money now. The demand for loanable funds by distinct groups of borrowers is determined by the cost of capital (Soludo, 2008; 2009). Most monetary policy regimes use interest rates and exchange rates as policy instruments to reduce inflation and stabilize the economy.

Since the re-emergence of financial liberalization concepts in the 1970s, however, many nations have made an effort to liberalize the economy by removing limits on credit, deregulating interest rates and exchange rates, allowing free access into the banking sector, permitting private ownership of banks, liberalizing international trade, and capital flows. However, currency rate and inflation liberalization have been the most important aspects of liberalization. Unfortunately, Ghana's experience has been uneven in this respect.

As a result, Olisadebe's (1991) assessment revealed a concerning trend in the naira currency rate, particularly throughout the SAP era, as it continued to fall. As a consequence, individuals have repeatedly advocated for the exchange rate to be fixed, even when pegged to the US dollar. On the topic of exchange rate equilibrium, the author went on to say that such a rate allows for both internal and external balance to be reached at the same time.

The selection of a currency regime is important to promote economic growth, but it is dependent on the economy's degree in terms of growth (David et al., 2010). Markets in developed nations where real and financial shocks are fully priced in perform better and deeper financial markets handled, and the pace of economic development does not rely as a lot on the exchange rate regimes you choose.

Nevertheless, a more adaptable exchange rate system allows an economy to make essential adjustments more quickly, it is only marginally correlated with somewhat better growth rates. Since growing and developing economies like those in Asia and Africa have fewer depths in their economic markets and more imperfect, they are less competent in markets to deal with monetary and real shocks. This increases the significance of choosing an exchange rate system (Oyejide and Udun, 2010).

According to Rogoff and Reinhartl (2004), emerging nations do better in terms of systems with variable exchange rates. While Oyejide and Udun (2010) said that countries in the early phases of the expansion of the economy and integration would

be better off with set or moderately rigid systems, it seems that this is not always the case.

Furthermore, David et al. (2010) argued that there is a nonlinear link between growth and regime choice in developing and emerging market nations, the fastest rate of development is correlated with fixed and managed float regimes. They also said that regime selection had little effect on the pace of economic development in advanced European nations. In conclusion, more flexible regimes are connected with somewhat greater rates of growth there.

Ubok-udom (1999) investigated the challenges Nigeria's SAP implementation context and concluded that the specific characteristics of the Nigerian economy hampered the effectiveness of depreciation in exchange rates in achieving positive outcomes. In his analysis of the link changes in currency rates and domestic production growth in Nigeria (1971–1955), he represented a country's output growth as a linear process of changes, an increase in the average nominal exchange rate. He also utilized fake variables to reflect currency depreciation periods. The experimental findings revealed that all of the primary explanatory variable coefficients had adverse indicators. However, Adebiyi and Dauda (2009) suggested, using an error correction model, which showed that, between 1970 and 2006, trade liberalization helped the Nigerian manufacturing sector flourish and stabilized the currency market. According to them, the industrial output index and actual exports had a positive and substantial link. A 1% increase in real exports raises the index of industrial output by 12.2%. It implies that the deregulation strategy had a beneficial influence on exports via currency rate decline. However, they are indirectly related via factors like money, imports, agricultural output, and assistance to other nations.

In order to quantify RER overvaluation, Razin and Collins (1999) offer a structural macroeconomic model-based metric, and then apply it to a combined sample of 93 developed and developing nations over 16-18 year time intervals beginning in 1975. This was done after discovering that their index has a negative relationship with economic development. Their findings also point to the presence of asymmetries, with overvaluation having a greater negative impact on growth than undervaluation. Calderon and Aguirre (2005) create three principles-based indicators RER

overvaluation for a 60-person panel industrialized and emerging countries from 1965 to 2003 and demonstrate that they adversely connect with rise in GDP per capita. The link seems to also be non-linear and asymmetric: In overvaluation scenarios compared to undervaluation scenarios, the predicted coefficients are greater, and as the level of underperformance increases, in absolute terms, they have been on the decrease. When fundamentally-built-in indices are substituted with PPP-based indices, the negative link between inflated prices and expansion remains. According to Prasad, Rajan, and Subramanian (2007), emerging nations that depend less on foreign finance expand more quickly. They also discover that financial influxes are related to a Purchasing Power Power-based indicator of Real Exchange Rate overvaluation. In the two cases it relates exclusively to poor nations; in wealthy countries, the connections are skewed. One possible reason for these results, they say, is that financial influxes likely to make local money stronger, which hinders economic expansion by making people less likely to invest in manufacturing.

Researchers look into the correlation between their RER overvaluation index and GDP growth and find a negative result. However, they fail to investigate whether or if there are any differences in this connection between developed and underdeveloped countries. In a panel of 58 developing nations from 1960 to 1999, According to Gala (2008), an indicator of RER overvaluation based on purchasing power parity (PPP), exchange rates is negatively correlated with GDP per capita growth. The outcome is resistant modifications in econometric techniques and control variables.

Berg, Ostry, and Zettelmeyer (2008) conduct a similar analysis, this time of the factors that contribute to prolonged growth in both evolving and evolved nations overvaluation, they shorten the duration of growth surges. Foreign currency (FX) reserve accumulation is positively connected to growth in GDP per capita and RER levels, as shown by a cross-country study conducted by Polterovich and Popov (2002) for emerging nations. Levy-Yeyati et al (2009) construct two indicators of FX involvement using data from developing countries and show (in two different regression models) that both are positively related to gross domestic product (GDP) growth and the RER score. The authors think that the results of these two studies show that central banks in developing countries build up FX reserves to keep RERs low and, by doing so, encourage growth.

Unlike the previous research, Rodrik (2008) specifically examines the imbalances

between developing and advanced countries between 1960 and 2004 for a panel of 184 nations in a fixed-effects model. He describes developing countries. as having a per-person GDP of not more than $6,000 and he discovers RER undervaluation's favorable correlation with economic development is greater and more significant than it is in industrialized countries. MacDonald and Viera (2010) investigated (and validated) the long-term viability of Rodrik's conclusions regarding variations in RER misalignment measurement. Another problem of robustness is addressed in our research. The following section, we demonstrate that Rodrik's finding is dependent on how the two kinds of nations are defined and that a meaningful association possibly also applicable to high-income nations.

FDI and GDP Growth Nexus

The economies of a number of nations in the region have been profoundly impacted by direct investment from outside companies FDI. It is often believed that FDI would boost economic development in the country where it is invested. boost growth, and encourage expansion. There has been a great deal of investigations carried out on the subject of foreign direct investment and the development of economies. Some studies have looked at the link between growth in GDP and FDI, whereas other studies have looked at each term independently. Researchers have arrived at a variety of findings, for example about the impacts of FDI on economic growth, based on the methodology that they used in their studies. To provide just one example, Balasubramanyam et al. (1996) investigates the function that FDI plays in the development of the economies of emerging nations. He finds the comparisons between groups using cross-sectional data and ordinary least squares regressions, that foreign direct investment (FDI) stimulates economic development in countries with a strategy to raise the amount of goods that are exported, but not in nations with a plan to lower the amount of goods that are imported.

The analysis provided by Olofsdotter (1998) is comparable. She discovers through cross-sectional data that FDI stock growth is associated with growth, with the effect being greater in host nations with better institutional capabilities, which are measured by how well property rights are protected and how well the government works.

FDI was also studied by Borensztein et al. (1998), who used a framework for international regression analysis to analyze FDI's implications for GDP expansion. The research used information on the amount of FDI from developed countries to 69 less developed countries during a twenty-year period. This research confirms the widespread belief that FDI is not only beneficial to economic development but also an essential means of transferring technological know-how to host countries. Foreign direct investment (FDI) has the potential to increase output, but only if the host country has adequate human resources. Therefore, FDI helps economic growth only when the host country has a high propensity to absorb new technologies. The impact of FDI on the economics and dissemination of technology in emerging nations is studied by Borensztein et al. (1998). The article claims that FDI helps economies expand, but that the growth is directly proportionate to the quantity of human capital in the country that gets the investment. There is no evidence linking FDI to economic development, even after De Mello's (1999) evaluation of the fixed effects of time series and panel data on a sample of 32 evolved and evolving nations. Zhang (2001) and Choe (2003), on the other hand, look at the link between FDI and economic growth. In his analysis, Zhang drew on information from 11 emerging countries in East Asia and Latin America. Zhang (2001) uses co-integration and Granger causality studies to determine that FDI promotes economic growth in five different scenarios, but with the importance of host nation characteristics such as the Regulatory framework for Trade and Macroeconomic Stability. Although there is some evidence that FDI encourages the growth of host nation economies, Choe (2003) discovered that the direction of causation between FDI and economic development might go either way, with a propensity for growth driving FDI. Rapid economic development may encourage more foreign direct investment.

Further study on the causal relationship between FDI and economic growth was undertaken by Chowdhury and Mavrotas (2003) using a state-of-the-art econometric approach to evaluate how one variable affects another. Large receivers of foreign direct investment but with very diverse macroeconomic histories are Chile, Malaysia, and Thailand with political systems, and growth patterns, provide the time series data utilized in the research, which spans from 1969 to 2000. Using a bootstrap test to verify the reliability of the results, they confirm that there is strong evidence of bi-directional causation between GDP and FDI in Malaysia and Thailand, but not in Chile. Frimpong and Abayie (2006) evaluate Ghana's performance before and after the implementation

of the Structural Adjustment Program to further investigate the connection between FDI and GDP development in the country (SAP).

We used data from a series of periodic measurements taken between 1970 and 2005. The research finds no connection between Foreign Direct Investment and growth during either the pre-SAP or overall sample periods. By contrast, FDI aided economic expansion in the years after SAP collapsed.

Using panel data for Latin America, Bengoa and Sanchez-Robles (2003) analyze the connection between FDI, economic freedom, and economic development. Using fixed and random effects models, Borensztein et al. find that FDI greatly contributes to the growth of the host country's economy, while the exact amount depends on the features of the host country (1998). Using a panel data set consisting of 72 industrialized and emerging economies, Carkovic and Levine (2002) investigate the impact of FDI flows on economic growth. In their research, the team performed both static OLS analysis and dynamic GMM-based panel data analysis.

Borenzstein et al. (1988) use cross-sectional information on 67 emerging countries from 1970 to 1989. Using apparently unrelated regression approaches, they discover that FDI is beneficial on economic development as a result of both technology development and the strength of the connection based on the caliber of the country’s human capital.

According to De Mello (1989), FDI has a favorable influence on economic expansion, but the evidence is poor. Zhang (2001) discovers a positive association in regard to Foreign Direct Investment and financial progress and suggests that the degree of the interaction is dependent upon the circumstances. Bengoa and Sanchez-Robles (2003) found the same result after analyzing panel data from 18 Latin American nations.

Charkovic and Levine (1998) analyze how foreign direct investment impacts growth in a country's economy employing a panel and cross-section data for 72 developing and developed nations from 1960 to 1995. They use OLS and GMM to try discovering a connection between FDI and economic expansion, but they can't find one.

Johnson (2006) discovers that FDI enhances economic development in underdeveloped countries utilizing panel and cross-section data from 90 countries. but not in rich economies owing to technological spillovers. The research also looks at how FDI affects economic growth in the key industrial and service sectors. According to Alfaro (2003), the advantages of FDI differ by industry. The effect of FDI on the major sector is negative, while the effect on the manufacturing and services sectors is positive but not clear.

From 1970 to 1999Li and Lue (2005) look into how FDI affects economic growth in 84 different nations. According to the research, FDI as well as human resources have a favorable influence on developing nations' economic development. Chowdhury and Mavrotas (from 1969 to 2000) examine the connection between FDI and sustainable development in Chile, Malaysia, and Thailand. FDI is shown to have a positive effect on economic growth in both Malaysia and Thailand, but only in the latter country relationship in Chile.

The FDI-led development hypothesis is reevaluated by Herzer and coworkers (2008) for a sample of 28 developing countries. Neither a long-term nor a short-term correlation between FDI and economic expansion could be shown. Employing Engle-Granger cointegration and error correction models in the vast majority of the sample countries. They found no evidence that FDI contributed to economic expansion. By analyzing cross-sectional data from 62 countries between 1975 and 2000, Wu and Hsu (2008) conclude that FDI contributes positively and significantly to economic development only when the host country has a greater GDP and human capital.

Using panel data from 2000 to 2006, Samimi et al. (2010) look into how FDI affects the economic growth of oil-importing nations (OIC) the panel regression technique's findings.

Ericsson and Irandoust (2001) took a cross-national look at how a rise in foreign direct investment (FDI) affected output expansion in four OECD countries: Denmark, Finland, Norway, and Sweden. There was no evidence found linking foreign direct investment to increased output in either Denmark or Finland. They theorized that the lack of a connection between the two phenomena may be attributable to the unique dynamics and nature of FDI into these countries.

Liu et al. (2002) conducted research in China to see whether there was a causal relationship between GDP growth, FDI, and trade. The research employed quarterly growth, FDI, exports, and imports data from 1981 to 1997 using a cointegration framework to establish a favorable and substantial link between FDI, growth, and exports.

Chakraborty and Basu (2002) use cointegration and error-correction models to investigate the association between FDI and economic development in India. The findings debunk the myth that foreign direct investment (FDI) is what drives India's GDP.

Wang (2002) investigates the foreign direct investment that is most likely to contribute significantly to economic development. Using data from 12 Asian countries between 1987 and 1997, she found that only FDI in the manufacturing sector had a substantial and beneficial influence on economic development. According to her analysis, this is the result of the repercussions of FDI.

Shen and Hsiao (2003) find a feedback link in their time-series analysis of Chinese data on FDI and GDP. Choe (2003) uses data from 80 nations from 1971 to 1995 and discovers two-way causality between FDI and growth. However, the impacts are stronger from expansion to FDI.

Chowdhury and Mavrotas (2005) looked at the link between foreign direct investment and GDP growth in three different countries: Chile, Malaysia, and Thailand.

Chile's GDP was determined to have a greater impact on FDI than any other factor. However, there is strong evidence in both Malaysia and Thailand that these two factors impact each other in both ways.

Duasa (2007) investigated the link between FDI and production growth in Malaysia and found no compelling evidence of a causal relationship between the two. Because growth fosters FDI stability, this would suggest that FDI does not directly create economic progress in Malaysia but does contribute to its stability. The results from these comparative studies of causation in both directions were contradictory. This

shows that the link between FDI and economic expansion is complex. The answer varies by country and by era.

Inflation and GDP Growth Nexus

The current paper provides a quick overview of various aspects of growth in the economy and inflation in diverse circumstances. Barro (1995) examined the inflation-growth relationship link in a broad sample of over 100 nations. He recognized a conflict between inflation and economic expansion that is statistically significant. In other words, the research implies the statistical process when some credible instruments are used, the association is negative. Bruno and Easterly (1995) discovered an uneven and inconclusive link between inflation and economic growth below the 40% barrier. Sarel (1996) discovered that inflation rates were low in most nations before the 1970swhen they started to rise. Thus, the majority of empirical investigations indicate that the association is favorable before that time but negative after that era.

Malla (1997) investigated the inflation-growth link using a small sample of Asian and OECD nations. He demonstrated the existence of a statistically significant negative link between inflation and economic expansion. The most important takeaway from the research is that there are multiple fundamental problems with the cross-country link between inflation and long-term growth, including adjustment in the nation sampled and time period.

Shitundu and Luvarda (2000) examine the link between inflation and growth in Tanzania using the Least Trimmed Squares (LTS) approach, in this study.

According to the report, inflation has been detrimental to Tanzania's economic progress. In the context of Brazil, Faria and Carneiro (2001) investigated the relationship between rising prices and rising GDP. The research discovered that, in the short term, In Brazil, there is while there is a short-term negative relationship between inflation and sustainable development, this relationship vanishes over the long-term.

Gylfason (2001) studied the correlation between rising prices and accelerating economic growth across countries in 170 developing and wealthy nations. The study's real-world results show that there is a strong and significant economic and statistical correlation between inflation and global economic growth.

Sweidan (2004) study the link among inflation and economic development from 1970 to 2003. He discovered that the inflation-growth link is beneficial and significant at a 2% inflation rate; above this level, economic growth is jeopardized. Between 1970 and 2003,Gokul and Hanif (2004) investigated the connection between price increases and the expansion of the Fijian economy.
The study found a tenuous and unfavorable correlation between price increases and economic growth. Mubarik (2005) looked into Pakistan's inflation threshold. He discovered that Pakistan's economic growth is harmed by an inflation rate of more over 9%. Between the years 1985 and 2005, Saaed (2007) investigated the link that existed between inflation and economic development in Kuwail. The empirical evidence shows a long-term and significant inverse link between rising prices and overall economic expansion. In Turkey, Eaboyka and Okuyan (2008) examined the link between rising prices and overall economic expansion. Using ARDL models, the research discovered that there is a statistically significant negative short-run link, but there is no statistically significant negative there is a possibility that the amount of time spent together will have a big role. According to the findings of research, the relationship between economic growth and inflation can only be described as unidirectional, whereas there is no evidence to suggest a connection between economic growth and inflation.

In four South Asian nations, the intricate workings of a mutually beneficial connection inflation and sustainable development over the short and long terms were examined by Mallick and Chowdhury (2007). The analysis discovered a statistically significant positive link between all four nations.

In six South Asian countries, Behera (2014a) looked into the relation involving rising prices and economic advancement. The empirical findings of the study show a strong positive relation between inflation and economic growth across all countries.

Additionally, the data demonstrates that, with the exception of Malaysia, economic growth and inflation do not always go hand in hand.

Behera (2014b) used sophisticated Pedronic panel cointegration to examine the connection between growth and inflation in the context of seven South Asian nations. According to the study, price rises and economic growth are unfavorably correlated across all countries. The statistics also showed that inflation and economic growth have a history of being related for all nations, as well as a unidirectional causation it covers everything from inflation to global economic development.

Fischer (1993) looked into this claim and discovered that there is a nonlinear connection between rising prices and growing economies. He observed that sustainable development and inflation have a positive link this correlation is positive when inflation is low and negative when inflation is high. Fischer's findings from 1993 start a new debate among economists about how much inflation is best for economic growth.

Various empirical research projects are being undertaken in this regard. In most countries, inflation rates were low prior to the 1970s, and empirical research conducted during this time period revealed confirmation of a positive connection among inflation and financial activities. However, after the 1970s, inflation rates started to rise, and studies conducted after that time period showed a negative relationship between these variables. Bruno and Easterly (1998) examined annual CPI inflation data from 26 nations that had inflation crises between 1961 and 1992 to learn more about sustainable development causes. Based on their data, they concluded that a 40% inflation rate is the threshold at which inflation becomes uncontrollable.

For industrial and developing countries separately, Khan and Senhadji (2001) looked at the link between rising prices and overall economic expansion and re-examined the existence of "Threshold" effects. According to their findings, for industrialized countries, the inflation threshold is 1% to 3%.whereas for underdeveloped countries it is 7% –11%. Lee and Wong (2005) assessed Taiwan and Japan's inflation threshold levels using quarterly data for Tiawan from 1965 to 2002 and 1970 to 2001 for Japan. According to their assessment models for threshold, an inflation rate of over 7.3% is damaging to Taiwan's economic development. In Japan, however, they discovered two

threshold levels: 2.5% and 9.7%. They claim that inflation rates below the anticipated 9.7 percent level are advantageous for economic growth, whereas rates past this level are detrimental to Japan's economic development. Munir and Mansur (2009) study the nonlinear link that exists between Malaysia's inflation rate and the country's overall economic growth from 1970 to 2005. They discovered that the 3.9 percent inflation threshold level supports the idea that there is not a direct correlation between changes in the rate of inflation and expansion of the economy. When inflation rates exceed the cutoff point, GDP growth slows down a lot. On the other hand, when inflation is less than the cutoff level, they help the economy grow a lot.

Sergii (2009) looked at how growth and inflation affected CIS countries from 2001 to 2008 and discovered that economic growth is slowed down when inflation is higher than 8%. and when it is lower than 8%, it is speed up.

CHAPTER III

Methodology

Introduction

This section of my thesis will provide in-depth information on the relationships between all of my variables; provide insight into the model utilized for data analysis in this thesis; and help you comprehend the many tests that were conducted to answer the aforementioned research question. In addition, you will get a knowledge of the data gathering sources and equations utilized to finish this thesis.

Data Source

Developing nations like Ghana confront a lot of obstacles when it comes to generating data that matches these standards. They are often locked in a vicious cycle: underinvestment in national statistics systems restricts operations and produces inaccurate data that policymakers hesitant depending upon. This low data's requirement results in fewer materials for its development and quality monitoring. The World Bank is dedicated to assisting developing nations to escape this cycle. Their work includes investments in statistical activities; the development and implementation of frameworks and standards data collecting, dissemination and analysis; the building of the system of statistics used throughout; and the compilation of global data sets.

The database of The World Bank is an essential resource for providing key statistical data for bank operations as well as supporting vital management decisions. When global standards and norms are used, they provide a consistent and reliable source of information.

To be useful, statistics must be accurate and relevant. They must be compiled accurately, according to accepted processes and procedures. They must also meet the demands of users and address policymakers' inquiries.

In light of this, we deem it essential to get our data for the study of this thesis from the World Bank's data website.

Variables

Foreign Direct Investment- Inflows of net direct investment from foreign sources (percentage of GDP) the transfer of debts in addition to properties held through resident direct investment companies, as well as their respective shareholders is known as inward direct investment, or simply direct investment, in the reporting economy. It also applies to asset and liability transactions between resident and nonresident enterprises in the event that the firm's ultimate controlling parent is located outside of the country.

Foreign direct investment (FDI) occurs when an investor from a different economy than the target economy acquires a 10% or greater voting stake in a company operating in the investor's home country. Capital in the balance of payments includes both current and noncurrent assets, such as profits, stock, and other capital that can be invested or used immediately. This number represents the percentage of a country's GDP that was contributed by net foreign investment inflows (new investment inflows minus outflows).

According to and Development, data on FDI is complemented by information from official national sources (UNCTAD). It is estimated that a country's net FDI inflows and FDI outflows look like this, per the IMF's Balance of Payments Manual, 6th Edition: (2009IMF).Global Financial Institutions Group projections using the UNCTAD data.

Real exchange rate- Exchange Rate Effectiveness Indices, 2010 = 100 To obtain the real effective exchange rate, one must multiply the nominal effective exchange rate by a cost index or price deflator.

The actual effective exchange rate is an estimate of the true value of the currency exchange rate, taking into account the effects of inflation or deflation in the home country, the selected countries, and the Eurozone. Index of the nominal effective exchange rate can be computed by comparing the weighted geometric average of exchange rates (stated on the basis of 2010 = 100) for selected nations and the Euro Area with an index of the period-average exchange rate of a currency. Most of the weights for the high-income countries come from the trade of manufactured goods

between the industrialized countries. The data comes from an index of the nominal effective exchange rate and a normalized relative measure of manufacturing unit labor costs. Exports and imports of manufactured and primary commodities traded with allies and rivals should be factored into the calculation of the nominal effective exchange rate index for a specified group of foreign nations. Real effective exchange rate index is the nominal index for these countries that takes inflation and wage growth into account. For the domestic currency to gain strength, the effective exchange rate index needs to rise.

Economic growth- Changes in the amount of an economy's production or in the actual expenditures or incomes of its citizens are indicators of economic growth. Three techniques for calculating GDP are provided by the 2008 System of National Accounts: a production method for calculating gross value added; a spending method; and an income approach. Everyone should, in theory, estimate the same amount. The statistics in the economic area let us study several facets of both regional and international economic activities. As countries make and sell services and products, use them locally, and trade with other countries, economic indicators keep track of the scope and makeup of their respective economies and show when they are growing or shrinking.

Indicators of economic performance include gross domestic product, consumer spending, business investment, and international trade, as well as macroeconomic results and stability (central government budgets, prices, the money supply, and the balance of payments). It also incorporates pollution, depreciation, and the exhaustion of resources into its overall measurement of revenue and savings.

Inflation- Utilizing the consumer price index, inflation is measured. It is the change in a basket's price as a percentage of products and services to the typical customer that may be constant or vary at predetermined intervals, such as once a year.
Consumers' cost of living is calculated by factoring in the relative prices of various products and services to the total amount available in their household budget. Government agencies perform surveys of households to compile a "basket of widely purchased items," and then monitor the basket's average price over time, in order to estimate the average consumer's cost of living. Paying for housing, such as rent or a

mortgage, consumes the greatest share of the average American's income. The most popular way to measure inflation is through the consumer price index (CPI), which does so by contrasting the cost of a standard basket of goods and services in the current year with its value in a predetermined base year. In contrast, inflation is quantified by calculating the percentage change in the CPI during the same time frame. (If the CPI in the base year is 100 and the CPI in the current year is 110, then the inflation rate for the period is 10 %.)

Inflation among consumers as measured by their purchasing power, excluding volatile categories like food and energy, which are mostly driven by seasonal factors or immediate supply restrictions, in order to focus on the underlying and persistent inflation patterns. Central planners often check on the pace of core inflation. A larger index, such as the GDP deflator, is necessary for calculating the inflation rate for the whole nation as opposed to simply individual consumers.

The components of the CPI basket are typically kept stable throughout time to ensure comparability. This list is sometimes updated to account for changes in consumer preferences, such as when new high-tech products replace older ones. When compared to the GDP deflator, whose components fluctuate from year to year, the CPI basket's contents are stale. This is due to the fact that the GDP deflator measures the general trend in the cost of all final products and services produced in a country. However, the deflator is not a credible way to estimate the cost of living since it includes non-consumer items like military expenditure.

Variable Description

Table 1.1: Variable Description

No.	Variables	Abbreviation	Measurement	Source
1	Gross Dosmectic Product	GDP	Annual (% of GDP)	World Bank
2	Foreign Direct Investment	FDI	Net inflow (% of GDP)	World Bank

3	Inflation	INF	Annual (% of GDP)	World Bank
4	Real Effective Exchage Rate	REER	(2010=100)	World Bank

Model Specification

Model specification refers to the explanation of the process via which the independent variables result in the dependent variable. So, it includes choosing the independent (and dependent) variable between the independent and dependent variables as well as other factors, or functional form.

The literature may be used to derive a PPP theory-based empirical model, with economic growth explaining the exchange rate while adjusting for the impacts of FDI and inflation. This model's functional form is stated as.

$$EG = f(REER, FDI, INF) \dots\dots\dots\dots 1$$

EG stands for the growth of the economy, REER for the exchange rate, FDI for foreign direct investment, and INF for inflation.
The logarithmic form of the general model's econometric formulation is

$$InEG_t = \beta_0 + \beta_1 InREER_t + \beta_2 InFDI_t + \beta_3 InINF_t + \mu_t \dots\dots 2$$

Descriptive Statistics

Using descriptive statistics, you can sum up the data for a chosen group. The data may also be graphed; you will be able to understand that specific group of observations using this approach. Descriptive statistics are used to characterize a sample. It just requires selecting a group in which you are interested, gathering data on its members, and then displaying the group's features using summaries of statistics and graphs. When using descriptive statistics, there is no space for uncertainty since

you are only describing the people or objects that you really measure. You are not trying to infer something about the traits of a bigger group.

Stationary Test

The unit roots may be tested in a variety of ways. These include the Philip-Perron (PP), Dickey-Fuller (DF), Durbin-Watson (DW), and Augmented Dickey-Fuller (ADF) tests. It is advised that the analyzed time series be plotted, the series' probable characteristics identified, and classical regression carried out before doing formal testing. A series that is climbing indicates that its mean has changed over time. In traditional regression, if the Durbin-Watson value is low and the R2 is high (Granger-Newbold, 1974), this could mean that the series is not stationary.

This is the first step toward a more formal test of stationarity. The Augmented Dickey-Fuller or Dickey-Fuller tests are the most commonly used methods for determining a Stationarity of a one time series. The appropriate tests are selected depending on the nature of the problem of interest to the practitioner. It is difficult to stay up with the latest innovations and to comprehend the complications that appear while using various exams. This should not be seen as an excuse to forego doing other types of unit root testing. Comparing results from many testing methods is an effective method for determining the sensitivity of your findings. Once you understand how these tests function and their limits, you'll be able to choose when to utilize them. The advantage is that it enables us to appreciate the intent and purpose of any examination. When a test result is inconclusive, the conventional method is to continue the investigation with a warning comment or to just assume one of the options. In order to calculate how many times a variable or series must be differentiated to prove stationarity; the unit root test is necessary. As a result, we have the idea of integration: if a variable Y stabilizes after being differentiated d times, then it is integrated of order d, I (d) (Engle and Granger, 1987). In order to determine if the variables were stationary, the ADF unit root test was utilized.

ADF and PP Unit Root Test

The Augmented Dickey Fuller test is a popular statistical method for checking the stationarity of a time series (ADF test). It is a popular statistical test for determining whether or not a given series is stationary. The augmented Dickey-Fuller (ADF) statistic fails to meet expectations for this test. A stronger negative result indicates that the unit root theory is being rejected with increasing conviction. In statistics and econometrics, the augmented Dickey-Fuller test (ADF) is used to test the null hypothesis that a unit root does not exist in a time series sample. Depending on the particular test version used, the null hypothesis could be either trend-stationarity or stationarity. It's a lot like the Dickey-Fuller test, but it's more thorough and can be used with a more complex set of time series models. The Phillips–Perron test is a kind of unit root test that is used in statistics. This test was named after Peter C. B. Phillips and Pierre Perron. That is, it is employed in time series analysis to test the null hypothesis that a time series is integrated in order 1, and it does so by comparing it to the actual data. Although the PP unit root test and the ADF test are very comparable to one another, the fundamental distinction between the two is in the manner in which each test handles serial correlation. In contrast to the PP test, which disregards the possibility of any serial correlation, the ADF makes use of a parametric autoregression in order to get a close approximation of the structure of the errors. Despite the distinctions between the two tests, the results of both of them almost always point to the same conclusion.

ARDL Bound Test

The initial step in the analytical process for the ARDL model is cointegration testing. This can be done using the Wald Test, which is meant to examine the "null hypothesis" that co-integration is not active. The bulk of the bound test is based on the joint F-statistic, whose asymptotic distribution deviates from the norm under the null hypothesis of no cointegration. The first step in the ARDL limits method is an ordinary least squares estimation of the equations (OLS). During the estimate of the equations, we may evaluate the stability of the relationships between the variables by conducting the F-test for the joint significance of the coefficients of the lagged levels of the

variables. The optimal lags will be selected using the Akaike information criteria, and the ARDL model will be appropriate for the long-run analysis between the variables (AIC).

ARDL Significant

The purpose of this method is to examine the relationship between IT spending and long- and short-term economic growth using cointegration and error correction models with the autoregressive distributed lag (ARDL) technique. To empirically evaluate the dynamic interactions and long-term relationships between the variables of interest, Pesaran et al. (2001) developed the bounds testing (or ARDL) cointegration approach. This procedure was used to estimate the model in order to study these connections and interactions. The benefit of this approach over the three-stage, nonlinear least squares method, which is extensively utilized in the majority of financial reaction analyses, is that it distinguishes between the short-term and long-term impacts of assistance. Mavrotas G, Ouattara B (2006)

The ARDL technique is employed for the three reasons listed below: Initially, the boundary testing process is straightforward. It enables estimation of the cointegration relationship, in contrast to previous multivariate cointegration approaches like Johansen and Juselius. after determining the lag order of the model, using ordinary least squares (OLS). The limits testing procedure does not require preliminary testing of model variables for unit roots, as is required by other methods like the Johansen method. To put it another way, it works whether the regressors in the model are pure I (0), pure I (1), or mutually cointegrated. Lastly, the test performs better with smaller sample sizes. The initial stage in the ARDL bounds testing strategy involves estimating the equation of the VECM via OLS in order to test for the presence of a long-run link among the variables. The stationarity of all variables can be estimated, and their order of integration can be identified, by performing a F test for the joint significance of the coefficients of the lagged levels of the variables. Fosu OAE, Magnus FJ (2006). Based on the equation (2) the ARDL model equation is developed as under:

$$\Delta InEG_t = \alpha_0 + \beta_1 InEG_{t-1} + \beta_2 InREER_{t-1} + \beta_3 InFDI_{t-1} + \beta_4 InINF_{t-1} + \sum_{i=0}^{q} \Delta\alpha_1 \, InEG_{t-k} + \sum_{i=0}^{p} \Delta\alpha_2 \, InREER_{t-k} + \sum_{i=0}^{p} \Delta\alpha_3 \, InFDI_{t-k} + \sum_{i=0}^{p} \Delta\alpha_4 InINF_{t-k} + \varepsilon_t \ldots\ldots\ldots\ldots 3$$

Furthermore, the ECT Model equation is developed as under based on the equation (3)

$$\Delta \, \mathrm{EG_t} = \alpha_0 + \sum_{i=0}^{q} \Delta\beta_1 \, InEG_{t-k} + \sum_{i=0}^{p} \Delta\beta_2 \, InREER_{t-k} + \sum_{i=0}^{p} \Delta\beta_3 \, InFDI_{t-k} + \sum_{i=0}^{p} \Delta\beta_4 InINF_{t-k} + \lambda ECM_{t-1} + \varepsilon_t \ldots\ldots 4$$

Residual Diagnostic

The Breusch-Godfrey serial correlation The LM test examines regression model errors for autocorrelation. In regression analysis, residuals from the model under investigation are used to construct a test statistic. The null hypothesis states that, up to rank p, there is no serial association.

ARDL models are used to depict time-varying financial time series, such as stock prices. Models based on ARDL assume that the variance of the current error term is proportional to the magnitude of previous mistakes. This causes volatility to cluster.

Normality tests are used to find out if a piece of data fits a normal distribution well or to find out how likely it is that a random variable also has a normal distribution.

Granger Causality Test

It is probable that you are familiar with the concept of Granger causality if you have read any of the published material on the vector autoregressive model. The Granger causality test is a type of econometric analysis that looks at whether or not one variable can accurately predict the behavior of another variable.

If determining the root cause of another variable helps in forecasting the other variable, then you should do so. Granger causation should not be performed if the information will not aid in anticipating the other variable. It is helpful to explore what Granger causality does not tell us in order to have an understanding of when to apply Granger causality testing. Granger causality merely offers information about the capacity to make predictions; it does not provide any insight into the genuine causal link that exists between two variables.

This should be looked at along with some of the statistical requirements for the Granger causality testing method.

The conventional Granger causality test necessitates the testing of the null hypotheses that REER does not create EG and vice versa, that FDI does not affect GDP, that FDI does not induce inflation, and, lastly, that inflation does not cause REER. It is possible to do this by only running the two regression models shown below:

$$\Delta InEG_t = \lambda_0 + \sum_{i=1}^{m} \lambda 1i\ \Delta In\ EG_{t-i} + \sum_{i=1}^{n} \lambda 2i \Delta REER_{t-i} + \sum_{t=1}^{p} \lambda 3i \Delta FDI_{t-i} + \sum_{i=1}^{q} \lambda 4i \Delta InINF_{t-i} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

$$\Delta InREER_t = \lambda_0 + \sum_{i=1}^{m} \lambda 1i\ \Delta In\ REER_{t-i} + \sum_{i=1}^{n} \lambda 2i \Delta EG_{t-i} + \sum_{t=1}^{p} \lambda 3i \Delta FDI_{t-i} + \sum_{i=1}^{q} \lambda 4i \Delta InINF_{t-i} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

Stability Tests

Using a succession of sums or sums of squares of recursive residuals, the Cusum tests determine whether or not the coefficients in a multiple linear regression model of the type y = X + are stable (standardized one-step-ahead prediction errors). The null hypothesis of coefficient stability asserts that the model's structure has changed over time if values in a series deviate from a specified range

CHAPTER IV

Results and Discussion

Introduction

This section of the thesis will respond to the research hypothesis by doing all of the regression analysis on all of the tests mentioned in chapter three and explaining the outcomes of those tests.

Descriptive Statistics

The purpose of descriptive statistics is to provide a summary of a sample. That's not too difficult to grasp. All that is necessary is selecting a group in which you are interested, collecting data on its members, and presenting that data using summary statistics and graphs to illustrate the group's features. If you're just describing the people or things that you're really measuring, then you can be certain that descriptive statistics are giving you an accurate picture. You are not aiming to generalize these results to a bigger population.

Descriptive Statistic

Table 2.1 Descriptive Statistic

	GDP	FDI	INF	REER
Mean	5.307936	3.915732	21.24987	98.45419
Median	4.700391	3.157000	17.04847	94.61936
Maximum	14.04712	9.466664	54.01291	143.9854
Minimum	0.513942	0.251309	8.481073	67.12236
Std. Dev.	2.537177	2.777037	10.92473	20.45578
Skewness	1.335259	0.476578	1.234294	0.474209
Kurtosis	5.955392	2.025409	4.035635	2.586562
Jarque-Bera	20.49359	2.400349	9.256685	1.382634
Probability	0.000035	0.301142	0.009771	0.500916
Sum	164.5460	121.3877	658.7460	3052.080
Sum Sq.Dev.	193.1180	231.3581	3580.494	12553.17

Observations	31	31	31	31

Source: (E-Views 12 Author's Computation)

You may summarize the data for a selected group using descriptive statistics, and you can visualize the data using graphs. This method will help you comprehend the data set.

The purpose of descriptive statistics is to provide a summary of a sample. That ought not to be too hard to understand. All that's required is picking a group to study, keeping track of data about its members, and utilizing charts and graphs to summarize the characteristics of that group. That's really all that's required. Since you are only describing the people or things that you are really measuring, descriptive statistics leave no opportunity for error. There is no wiggle space here. You aren't trying to generalize about what people in general are like. The presence of a single mode (peak) or several modes is often the most striking feature of a distribution's overall shape. Most data sets are uni-modal, meaning they have a single peak; if this is the case, the next thing to look for is whether or not the distribution is symmetric or leans to one side. When the distribution's peak is on the right and the left tail is longer than the right tail, we say that the distribution is skewed right, or positively skewed. If most of the data lies to the left and the right tail is much longer, we say the distribution is skewed left, or negatively skewed. The normal distribution is used in most statistical analyses since its kurtosis equals 3. This leads to frequent discussions of the term "excess kurtosis," when the third kurtosis is substituted for the second in the calculation. For instance, the term "kurtosis" used by Excel could more properly be referred to as "excess kurtosis."

With normal distributions, kurtosis is always 3, without exception (excess kurtosis is exactly 0). Any distribution with kurtosis 3 and excess > 0 is called mesokurtic.

A platykurtic distribution is defined as one in which the kurtosis and excess kurtosis are, respectively, less than three and less than zero. Compared to a normal distribution, it often has a flatter central peak and wider tails. A leptokurtic distribution is one with a kurtosis more than three and an excess kurtosis greater than zero. When compared

to a normal distribution, non-normal distributions tend to have longer, fatter tails and a higher, sharper peak.

Unit Root Test

Different methods exist for identifying unit roots. They include, for instance, the Durbin-Watson (DW), Dickey-Fuller (DF), and Augmented Dickey-Fuller (ADF) tests, as well as the Philip-Perron (PP) test. It is advised that the analyzed time series be plotted, the series' probable characteristics defined and classical regression done before proceeding with formal testing. If the series is climbing, it indicates that the series' mean has changed over time. If the Durbin-Watson value is low and the R2 is high (Granger-Newbold, 1974), this might indicate that the series is not stationary.

Step one of a more rigorous stationary test. When analyzing a single time series, the most popular methods for testing stationarity are the Dickey-Fuller and Augmented Dickey-Fuller tests. The appropriate tests are selected in accordance with the practitioner's area of expertise.

It is tough to keep up with the current developments and to understand the complexities that arise while employing multiple examinations. This should not be seen as a reason to avoid doing other sorts of unit root testing. Comparing data from several testing techniques is a good way to determine the sensitivity of your findings. If you understand how these tests work and their limitations, you'll be able to decide when to use them. The benefit is that it allows us to understand the objective and purpose of any investigation. When a test result is inconclusive, the standard procedure is to continue the study with a cautionary note or to just assume one of the choices. The unit root test must be performed to determine how often a variable or series must be differentiated in order to prove stationarity. This is the original inspiration for the concept of integration: if a variable Y tends toward stationarity after d differentiations, we say that it is integrated of order d, and we write this as I (d) (Engle and Granger, 1987). The ADF unit root test was employed to determine the stationarity of the variables in this study.

Unit Root Test

Table 3.1: Unit Root Test

ADF UNIT ROOT TEST				*PP UNIT ROOT TEST*		
Variables	*Level*	*1st difference*	*Order/result*	*Level*	*1st difference*	*Order/result*
GDP	*0.1518*	*0.0137*	*I(1)*	*0.1715*	*0.000*	*I(1)*
FDI	*0.3734*	*0.0014*	*I(1)*	*0.3767*	*0.0001*	*I(1)*
INF	*0.0113*	*-0-*	*I(0)*	*0.0113*	*-0-*	*I(0)*
REER	*0.2583*	*0.0012*	*I(1)*	*0.1090*	*0.0001*	*I(1)*

Source: (E- Views 12 Author's Computation)

This is supported by the results of the ADF unit root test, which show that the variables are stable at both the zero and one-order levels. Similar to FDI (foreign direct investment), REER (real effective exchange rate), and INF (international net investment), the results show that the variable reflecting GDP growth remains stagnant at the same level (inflation). This finding shows that GDP and INF are level-stationary with p-values of 0.0325 and 0.0113, respectively, and that FDI and REER are first-difference-stationary with p-values of 0.0014 and 0.0012, respectively. Both FDI and REER have stalled out at their current levels.

For the PP unit root, only inflation is stationary at level, while GDP growth, foreign direct investment and real effective exchange rate are stationary at first difference.

ARDL Bound Test

The ARDL model's analytic approach kicks off with a test for cointegration. To conduct a test of whether or not co-integration exists, you can use a statistic called the Wald Test. According to the "null hypothesis," co-integration does not exist. The joint F-statistic is the primary determinant of significance in the bound test, and its asymptotic distribution deviates from the expected value under the null hypothesis of no cointegration. Ordinary least squares are used to make estimates for the equations

in the ARDL limits method (OLS). The F-test is used to determine whether or not the estimated coefficients of the lag levels of the variables are statistically significant when doing equation estimation. The goal of this analysis is to ascertain if the relationships between the variables are stable throughout time.

ARDL Bound Test

Table 4.1: ARDL Bond Test

Model	*Lag.*	*F-Statistic*	*Decision*
GDP, NT, REER, INF, FDI	*(3,2,0,0)*	*0.605651***	*Co-Integration Exist*
Bound Value	*Critical*		
		I (0)	*I (1)*
Sign.	*10%*	*3.47*	*4.45*
	5%	*4.01*	*5.07*
	2.5%	*4.52*	*5.62*
	1%	*5.17*	*6.36*

Source: (E-Views 12 Author's Computation)

*Note: 1%*** 5%** 10%* level of significant*

The projected value for the ARDL F-statistic is 6.605651, which is a value that is more than the upper critical limits of 1%, 5%, and 10% as established by EViews 12. In this case, the estimated F-statistic is larger than the upper-limit critical value, thus we reject the null hypothesis that there is no co-integration. Another way of putting it is that the model's variables are interconnected with the future.

ARDL Short And Long Run Test

The fundamental goal of this method, which makes use of the autoregressive distributed lag (ARDL) method of cointegration and error correction models, is to find out if there is a long-term and short-term causal relationship between economic growth and investment in IT. To empirically explore the long-run links and dynamic interactions among variables of interest, Pesaran et al. (2001) developed the boundary

testing cointegration approach, commonly known as ARDL. This technique was used to estimate the model so that these relationships could be better studied.The non-linear, three-stage least squares approach, which is extensively employed in most fiscal response studies, has the disadvantage of not being able to discriminate between the short-term and long-term impacts of assistance. This method, on the other hand, has the benefit of being able to do so. Mavrotas and Ouattara, G., and Ouattara, B. (2006) There are three main reasons why the ARDL method should be used: The procedure for border inspection appears simple at first glance. Notably, earlier multivariate cointegration techniques, such as those proposed by Johansen and Juselius, were unable to predict the cointegration relationship when the lag order of the model was known. The strategy for testing the limit does not necessitate an initial inspection of model variables to locate any unit roots, in contrast to methods like the Johansen methodology. This holds true whether the regressors in the model are pure I (0), pure I (1), or mutually cointegrated with one another. Third, the test is more precise even with a little sample size.

Short-Run ARDL Test

Table 5.1 ARDL Short Run

	ARDL Short run			
Variables	***Coef.***	***Std.error***	***t-statistic***	***P value***
FDI	*0.860*	*0.231*	*3.622*	*0.0019*
D(FDI(-1)	*0.946*	*0.264*	*-3.579*	*0.0027*
INF	*0.012*	*0.030*	*-0.411*	*0.6856*
D (REER(-1)	*-0.012*	*0.034*	*0.902*	*0.0677*
ECM	*-0.710*	*0.124*	*-5.724*	*.0000*

Source: (E-Views 12 Author's Computation)

ARDL Long-Run Test

Table 6.1 ARDL Long-Run Test

	ARDL Long run			
Variables	***Coef.***	***Std.error***	***t-statistic***	***P value***
FDI	*1.019*	*0.265*	*3.842*	*0.0012*
INF	*-0.145*	*0.064*	*-2.238*	*0.0381*
REER	*-0.072*	*0.065*	*-1.108*	*0.2824*
C	*16.329*	*9.096*	*1.795*	*0.0894*

Source: (E-Views 12 Author's Computation)

Table 6.1 Short- and long-term ARDL tests provide similar findings, indicating the existence of a correlation between the two variables.

An increase in FDI into the Ghanaian economy is estimated to increase GDP growth by 0.860% in the short term and by 1.019% in the long run. This result is consistent with the findings of Antwi, Mills, and Zhao4 (2013), on whose work this article is based, who examined the impact of FDI on Ghana's economic growth between 1980 and 2010. Various economic metrics, such as GDP growth rate, GNP, production value added, foreign debt stock, inflation, commerce, and industry's value contribution, are typically reported as a percentage of GDP. The proportion of GDP that is comprised of trade, industrial value added, and net inflows of foreign direct investment are calculated (FDI ratio). We discovered that ordinary least squares (OLS) regressions yielded the most trustworthy findings based on our empirical research of yearly FDI data and other variables between 1980 and 2010. We consulted the International Monetary Fund's yearly tables of global financial information. One of the aims of this research is to establish the degree of connection between these variables. Because their individual t-statistic p-values are less than 5%, the independent variables GDP, GDP, GNI, MVA, GDP, and TRA all have a role in explaining FDI in Ghana. The country of Ghana served as the site for this investigation. It is not only politicians and

bureaucrats who should care about these findings; investors and consumers should as well.

But inflation and the exchange rate both drag down Ghana's economic expansion, with inflation being the more significant factor. The objective of Agyire-Tettey and Coleman (2008) was to examine the effect of real exchange rate volatility on foreign direct investment (FDI) in a relatively small developing economy like Ghana by using a more comprehensive data set, a longer time period, and a relatively thorough and robust approach. The team wanted to find out how shifts in Ghana's actual exchange rate affected FDI (FDI). Dates between 1970 and 2002 are represented in this data set.

To calculate the true degree of exchange rate volatility, we used the ARCH and GARCH models, while the co-integration and ECM models were used to evaluate both the short-term and long-term correlations. The research found that despite liberalization efforts, foreign direct investment (FDI) into Ghana has not increased as a consequence of real exchange rate volatility. Findings also showed that despite the stock of FDI and political variables being predicted to support FDI investment, most FDI investors do not consider the size of the Ghanaian market when selecting whether or not to invest in Ghana. The most important takeaways from this study are (1) the dearth of previous research on this topic in Ghana and (2) the adoption of a more stringent and all-encompassing method for calculating the impact of actual exchange rate risk on FDI (FDI).

Residual Diagnostic Tests

Table 7.1: Residual Diagnostic Test

Name of test	***Test***	***T statistic***	***P value***	***Results***
Breusch Godfrey LM test	*Serial correlation*	*0.936851*	*0.2491*	*No serial correlation*

Jarque-Bera test	*Normality*	*0.773748*	*0.679177*	*Normal distribution*
Greusch-pagan test	*Heteroskedasticity*	*1.429840*	*0.2329*	*No heteroskedasticity*

Source: (E-Views 12 Author's Computation)

The hypothesis predicts a normal distribution, as seen in the table above, as well as no serial correlation or conditional heteroskedasticity. The outcomes of this finding are consistent with what the theory predicted. They are not even close to following a normal distribution; in fact, they are not even close. Nonetheless, despite the fact that the alternative hypotheses indicate otherwise, the null hypothesis demonstrates that the model does not, in fact, feature serial correlation. To add to the confusion, the probability of this happening is 0.2491, which is substantially higher than the 0.05% limit and by a factor of 2. In this case, it is deemed that the null hypothesis is accurate, and any thought that the model may show serial correlation is rejected. The model does not demonstrate heteroskedasticity at the 5% significance level as a result of the null hypothesis. Because the significance level is 5, this is the case. This model does not get stuck around the 5% threshold and stagnate after being put through its paces. If the likelihood value of 0.2329 is more than the 0.05 percent threshold, it suggests that the situation is more severe than first thought. We must conclude that the model does not exhibit heteroskedasticity at this level since we are unable to reject the null hypothesis at a significance level of 5%. This is the only logical outcome for us. If we accept the null hypothesis, the data set should have a normal distribution between the percentages of 5 and 10%, or someplace in that range. Residue frequency distributions are generally 5% of the total. The Jarque-Bera probability cannot be considered significant since the likelihood of 0.679177 is statistically larger than the 0.05 percent criterion. As a result, the likelihood cannot be considered significant. If the null hypothesis about cointegration is right, then at the 5% level, residuals have a normal distribution.

Granger Causality Test

Table 8.1 Granger Causality

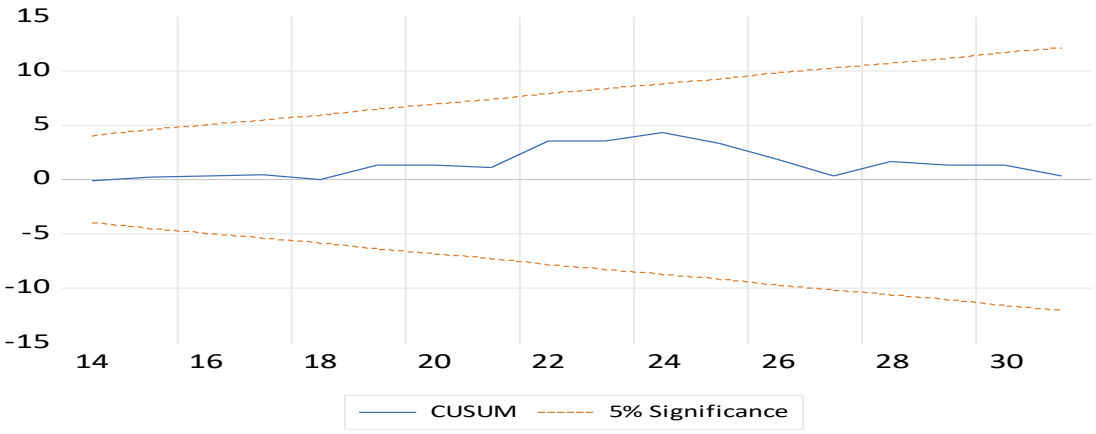
Null Hypothesis:	**Obs**	**F-Statistic**	**Prob.**
FDI does not Granger Cause GDP	29	2.00496	0.1566
GDP does not Granger Cause FDI		0.05826	0.9435
INF does not Granger Cause GDP	29	0.79619	0.4626
GDP does not Granger Cause INF		2.27921	0.1241
REER does not Granger Cause GDP	29	0.58872	0.5629
GDP does not Granger Cause REER		0.91948	0.4129
INF does not Granger Cause GDP	29	0.47776	0.6259
GDP does not Granger Cause INF		0.07497	0.9280
REER does not Granger Cause GDP	29	1.67109	0.2092
FDI does not Granger Cause REER		0.88691	0.4250
REER does not Granger Cause INF	29	3.58557	0.0434
INF does not Granger Cause REER		2.58109	0.0965

Source: (E-Views 12 Author's Computation)

The traditional Granger causality test requires the testing of the null hypotheses that REER does not create EG and vice versa, that FDI does not affect GDP that FDI does not induce inflation, and finally, that inflation does not cause REER. All of these hypotheses must be tested in order to determine whether or not they are true. The value demonstrates that there is a causal relationship between the variables, but only in one direction. Only two of the variables in this study may be said to have a generalized causal relationship with one another. At the 5% threshold of a substantial real exchange rate, granger produce inflation, but granger does not cause inflation.

Stability Test

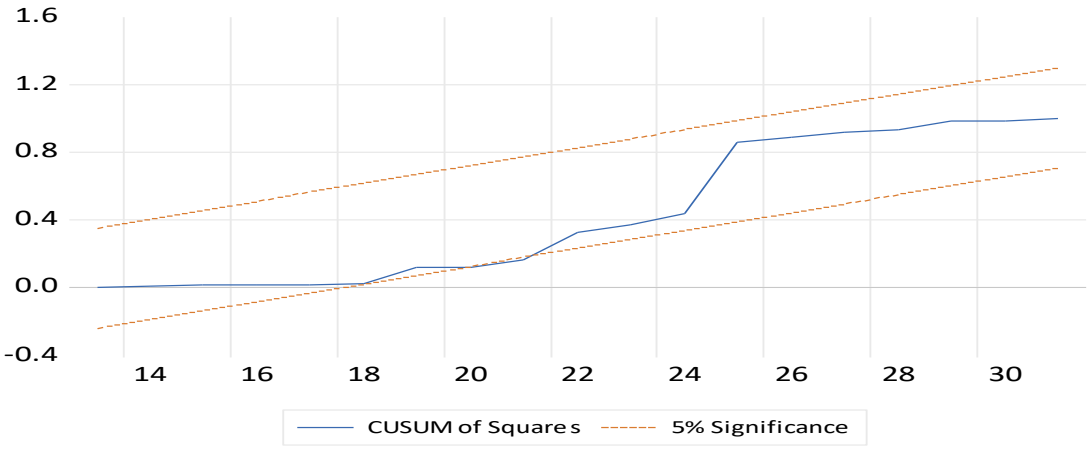
Figure 1.1 CUSUM test



Source: (E-Views 12 Author's Computation)

CUSUM of Squares Test

Figure 2.1 CUSUM of Squares



According to the findings of the tests, the blue line is incapable of growing beyond the boundaries of the red line. Because we would like to believe that the residual variances are stable rather than unstable, we will go ahead and accept the null hypothesis while simultaneously rejecting the alternative hypothesis. This will make the situation much more difficult. The residual variance is stable, as opposed to being unstable, which is

another conclusion we have reached. Last but not least, the long-term stability of the ARDL model's long-term coefficient was assessed in light of the short-term dynamics of FDI, exchange rate, and GDP growth variables via cumulative sums of recursive residuals (CUSUM) and cumulative sums of squares (CUSUMQ). Both of these methods are together referred to as "cumulative sums." According to the null hypothesis, there is no variation in any of the error correction coefficients that are included in the error correction model within a 5% confidence interval. This assertion is based on the fact that there was an attempt to test the hypothesis. Bahmani, Oskooee, and Ng (2002)If one or more of the borders are found to have been breached, the consistent coefficients null hypothesis can be rejected at the 5% level of significance. The critical restrictions shown in the preceding graphic must be adhered to in order for the plot of CUSUM and CUSUMQ data to be valid. Because of this, the exchange rate coefficient is guaranteed to remain stable throughout the course of time.

CHAPTER V

Summary, Conclusion and Recommendations

Summary

The purpose of this thesis is to consider the results of currency rates and FDI on the Ghanaian economy. Foreign exchange rate fluctuations may have an effect on an economy's fiscal health. Pricing for individuals, businesses, and governments could be affected by fluctuations in the value of foreign currencies. Benita and Lauterbach (2004) demonstrated the significant economic implications of fluctuations in exchange rates on pricing stability, corporate profitability, and national stability. The effects of fluctuations in currency exchange rates on a country's financial system are felt most acutely in the stock market. A look at the current data, however, shows that diverse experts have divergent opinions on whether or not fluctuations in FX rates impact stock market volatility (Frank and Young, 1972; Solnik, 1987; Taylor and Tonks, 1989).The local stock market is negatively impacted by the appreciation of a floating exchange rate, which also lessens the competitiveness of export markets. (Yucel and Kurt, 2003). However, since it lowers input costs, it is possible that this will have a beneficial effect on the stock market. for nations that depend substantially on imports. Ghana has a modest and open economy. Because it carries on business internationally with a number of nations, the exchange rate of its money varies in relation to the currencies of other countries. The Ghana Stock Exchange was established in July 1989 as a private organization limited by guarantee in accordance with the provisions of the Companies Code, 1963. It is currently considered an emerging market. In terms of stock turnover, it reached an all-time high in 1997 with 125.63 million shares traded, up from 1.8 million shares at the end of 1991. Immediately after these occurrences, the volume drops from 125.63 million in 1997 to 91.45 million in 1998, then from 49.57 million in 1999 to 30.72 million in 2000. From a high of 55.33 million in 2001, sales dropped to 44.12 million in 2002, rose to 96.33 million in 2003, and peaked at 104.35 million in 2004. As of the end of 2003, the All-Share Index had the highest yield of any stock market in the world at 154.7 percent (or 142.7 percent in USD terms) (GSE Fact Book, 2005). Such behavior has resulted in a highly erratic market share index, with sharp spikes and dips occurring at regular intervals. Nevertheless, empirical data on the influence of currency the stock market's erratic behavior, for the most part,

contradictory. These are the economies that have competed with the industrialized ones. According to Mishra (2004), there is no general theoretical consensus concerning the link between stock prices and currency rates. Ghana is a model example of an open economy that is actively engaged in international commercial dealings. Furthermore, as a result of globalization, developing economies are becoming increasingly connected with established economies, resulting in a rise in the import and export activity. Ghana is no exception to this rule. When you examine the country's currency exchange rates throughout time, you can see that they have changed dramatically. Exchange rate management is critical to the progress of economies all over the globe, but notably in Ghana, where inadequate exchange rate management has contributed to both economic and political instability. When it comes to producing data that meets these requirements, developing countries like Ghana have several challenges. They are often caught in a vicious cycle in which underinvestment in national statistics systems hampers operations and creates low-quality data on which policymakers are unwilling to rely. Because there is a low need for data, there are less accessible resources for its generation and quality control. The World Bank is devoted to supporting developing nations in breaking free from this cycle. They are responsible for funding statistical projects, creating and executing guidelines for data collecting, analysis, and dissemination, building the international statistical system, and assembling global data sets. The databases of the World Bank are essential resources for supporting crucial managerial choices and offering crucial statistical information for bank operations. When used, international standards and norms provide a reliable and consistent source of information. Statistics must be accurate and relevant in order to be helpful. They must be correctly prepared in accordance with approved techniques and procedures. They must also accommodate user expectations and respond to policymakers' questions. As a result, we believe it is critical to get our data for the research of this thesis from the World Bank's data website. Using the autoregressive distributed lag (ARDL) method of cointegration and error correction models, this method attempts to determine if there is long- and short-term causation between GDP growth and IT investment. The boundary testing (or ARDL) cointegration method was developed by Pesaran et al. (2001) to conduct an experimental investigation of the dynamic interactions and long-run correlations among relevant variables. This method of estimating the model was used to probe these interconnections. Most fiscal response studies use a non-linear, three-stage least squares method, but this approach has the

advantage of being able to differentiate between the aid's short- and long-term effects. Drs. B. Ouattara and G. Mavrotas (2006)

There are three things to think about when considering whether or not to implement an ARDL strategy: The border testing strategy appears simple at first glance. As opposed to earlier multivariate cointegration methods like Johansen's and Juselius's, it permits the cointegration relationship to be estimated with ordinary least squares (OLS) when the lag order of the model is known. Contrary to the Johansen method and other similar processes, the limit's testing strategy does not necessitate a preliminary check of the model variables for unit roots. This finding holds regardless of whether the regressors in the model are pure I (0), pure I (1), or mutually cointegrated. Third, the significance of the test is increased even with limited data. The ARDL limits testing procedure begins with ordinary least squares (OLS) estimate of the VECM equation, and is followed by a F test for the joint significance of the coefficients of the lagged levels of the variables (i.e., the stationarity status of all variables can be estimated, and their order of integration can be determined). Magnus FJ, Fosu OAE reported (2006).

Different methods exist for identifying unit roots. They include, for instance, the Durbin-Watson (DW), Dickey-Fuller (DF), and Augmented Dickey-Fuller (ADF) tests, as well as the Philip-Perron (PP) test. It is advised that the analyzed time series be plotted, the series' probable characteristics defined, and classical regression done before proceeding with formal testing. If the series is climbing, it indicates that the series' mean has changed over time. If the Durbin-Watson value is low and the R2 is high (Granger-Newbold, 1974), this might indicate that the series is not stationary.

To perform a rigorous stationarity test, this preliminary step is required. Whether or not a single time series is stationary is often determined using either the Dickey-Fuller or Augmented Dickey-Fuller tests. Appropriate assessments are selected according to the practitioner's area of expertise.

It is tough to keep up with the current developments and to understand the complexities that arise while employing multiple examinations. This should not be seen as a reason to avoid doing other sorts of unit root testing. Comparing data from several testing techniques is a good way to determine the sensitivity of your findings. If you understand how these tests work and their limitations, you'll be able to decide

when to use them. The benefit is that it allows us to understand the objective and purpose of any investigation. When a test result is inconclusive, the standard procedure is to continue the study with a cautionary note or to just assume one of the choices. When checking for stationarity in a variable or series, the unit root test is used to determine how many differentiations are necessary. It is from this that the concept of integration stems: if a variable Y tends toward stationarity after d differentiations, then it is integrated of order d, I(d) (Engle and Granger, 1987). We used the ADF unit root test to check the variables for stationarity in this study.

An established statistical method for detecting whether a time series is stationary or not is the The Augmented Dickey-Fuller (ADF) test is a popular statistical technique for testing the stability of a time series. There is a negative augmented Dickey-Fuller (ADF) statistic for the test. As the negative feedback loop continues, the unit root idea is increasingly and overwhelmingly disproved.

The enhanced Dickey-Fuller test is used in statistics and econometrics to evaluate the existence of a unit root in a time series sample when the null hypothesis is that no unit root exists (ADF). The null hypothesis may be either trend-stationarity or stationarity, depending on the version of the test employed. It's a more advanced spin on the classic Dickey-Fuller test that may be used to more complex models of time series. According to the ADF unit root test, the variables are stationary at the zeroth and second highest levels (1). (1). Inflationary pressures (INF), foreign direct investment (FDI), and the real effective exchange rate (REER) are all stationary at the first divergence from the level (inflation). This result indicates that two of our variables, GDP and INF, are stationary at the level, with p values of 0.0325 and 0.0113, respectively, but the other two variables, FDI and REER, are stationary at the first difference, with p values of 0.0014 and 0.0012.The ARDL F-statistic of 6.605651 is more than the 1%, 5%, and 10% upper critical limits in EViews 12. The hypothesis of no co-integration is rejected due to the fact that the estimated F-statistic is bigger than this maximum critical value. In other words, the model's variables are linked over the long term. Table 4.3 displays the results of the ARDL short- and long-run tests, indicating a long- and short-run link between the variables.

FDI is statistically significant and has a positive influence on the Ghanaian economy; a 1% increase in FDI inflows into the Ghanaian economy boosts short-term economic growth by 0.860% and long-term economic development by 1.019%. This result

agrees with a study of the link between FDI and GDP growth in Ghana from 1980 to 2010 by Antwi, Mills, and Zhao4 (2013). Many economic indicators are expressed as a percentage of GDP, including GDP growth rate, GNP, Production Value Added, Foreign Debt Stock, Inflation, Trade, Industry Value Added, and Net Foreign Direct Investment (FDI ratio). Our empirical analysis used ordinary least squares (OLS) regressions, including data on FDI and other variables collected annually from 1980 to 2010. The International Monetary Fund's annual tables of international financial statistics served as our data source. The goal of this study is to establish the nature and extent of the linkages between these variables. The independent variables GDP, GDP, GNI, MVA, GDP, and TRA all have an effect on FDI in Ghana because their corresponding p-values in the t-statistic are less than 5%. The implications of these findings extend to the political sphere, as well as governments and the financial sector. As opposed to, inflation and the currency rate have an adverse influence on Ghana's economic growth, with inflation being significant and the exchange rate being low. This result was consistent with Agyire-Tettey and Coleman's (2008) investigating the effects of real exchange rate fluctuation on foreign direct investment (FDI) in a small developing nation like Ghana utilizing a larger data collection, a longer time frame, and a rather thorough and strong strategy. A time series of data was created using data from 1970 to 2002.

Exchange rate volatility was measured using the ARCH and GARCH models, and short- and long-term correlations were evaluated using co-integration and the ECM. While the liberalization process has helped, it has not led to an increase in foreign direct investment (FDI) into Ghana, according to the study's findings. It is also noted that most foreign investors ignore the size of the Ghanaian market when deciding whether or not to invest in the country, despite the fact that both the existing stock of FDI and political determinants are likely to attract FDI.The key implication of the research is the shift from using ratios to a more rigorous and thorough approach for estimating the impact of actual exchange rate risk on FDI, as well as the fact that research of this kind is nearly nonexistent in Ghana. As seen in the table above, the hypothesis predicts a normal distribution with no serial correlation or conditional heteroskedasticity. The results of this discovery are compatible with the theory's predictions. They aren't even near a normal distribution; in fact, they aren't even close. Nonetheless, despite the fact that the alternative hypotheses suggest otherwise, the null

hypothesis shows that the model lacks serial correlation. To add to the confusion, the likelihood of this occurring is 0.2491, which is a factor of two larger than the 0.05% restriction. In this situation, the null hypothesis is considered correct, and any notion that the model may exhibit serial correlation is disregarded. As a consequence of the null hypothesis, the model does not exhibit heteroskedasticity at the 5% significance level. This is because the significance level is set to 5. After being put through its paces, this model does not get stuck around the 5% level and stagnate. If the probability value of 0.2329 exceeds the 0.05 percent threshold, it indicates that the problem is more serious than first assumed. Because we are unable to reject the null hypothesis at a significance level of 5%, we must infer that the model does not show heteroskedasticity at this level. For us, this is the only logical consequence. If we accept the null hypothesis, the data set should have a normal distribution with a percentage range of 5–10%, or something close to that. Residue frequency distributions account for around 5% of the total. Because the likelihood of 0.679177 is statistically greater than the 0.05 percent criteria, the Jarque-Bera probability cannot be declared significant. As a consequence, the possibility is not deemed substantial. If the null hypothesis concerning cointegration is correct, then residuals have a normal distribution at the 5% level. The test results show that the blue line cannot extend beyond the confines of the red line. Because we want to believe that residual variances are stable rather than unstable, we will accept the null hypothesis while rejecting the alternative hypothesis. This will worsen the situation. In addition, we discovered that the residual variance is stable rather than unstable. Finally, the long-term stability of the ARDL model's long-term coefficient was evaluated in light of the short-term dynamics of FDI, exchange rate, and economic growth variables using cumulative sums of recursive residuals (CUSUM) and cumulative sums of squares (CUSUMQ). Together, these approaches are known as "cumulative sums."The null hypothesis says that, within a 5% confidence range, there is no variation in any of the error correction coefficients provided in the error correction model. Ng, Bahmani, and Oskooee (2002) If any of the lines is shown to be crossed, the null hypothesis of consistent coefficients may be rejected at 5% significance. The CUSUM and CUSUMQ data displays must comply with the essential restrictions shown in the picture above. This guarantees that the exchange rate coefficient remains constant throughout time.

Conclusion

This thesis's objective is to investigate the influence of currency rates and FDI on the Ghanaian economy. The volatility of currency rates contributes significantly to the hazards that exist in the financial industry. Significant changes in the value of comparing one money to another may be harmful to both international trade and investment. The breakdown of the Bretton Woods Institution in 1973, according to Baig (2001) and Hviding et al. (2004), increased the degree of volatility in real interest rates. Due to this event, floating exchange rates replaced fixed exchange rates; it significantly affected the growth of the economy, money movement, and business practices throughout the globe.

The swings in the value of the currency exchange rate may be caused by a number of factors. According to Froot and Rogoff (1991), as the quantity consumed by the government increases, the relative price of non-tradable rises. This is because non-tradable account for a significant portion of the overall amount spent by the government. Increases in government consumption are associated with real appreciation, according to De Gregorio et al. (1994), who also support this view.

According to Stancik (2007), the cause of exchange rate volatility may be linked to a variety of factors. Among these were an overview of the local and international money supply, inflation, the level of output, and the exchange rate system. Interest rates, the degree to which an economy is open for business, and the independence of its central bank are the remaining elements. In a different but related study on the variables that determine currency rate volatility, according to Juthathip (2009), there are five key elements that determine the actual exchange rate throughout the medium to long term. Productivity differentials, openness, and trade terms were two of the five fundamental determinants identified as having a medium-to-long-term influence. The remainder consists of net assets held in foreign nations and government expenditure. The databases of the World Bank are essential resources for supporting crucial managerial choices and offering crucial statistical information for bank operations. Global standards and norms offer a consistent and dependable source of information when they are applied.

Statistics must be accurate and relevant in order to be helpful. They must be correctly prepared in accordance with approved techniques and procedures. They must also accommodate user expectations and respond to policymakers' questions. As a result,

we believe it is critical to get our data for the research of this thesis from the World Bank's data website.

By applying the autoregressive distributed lag (ARDL) approach to cointegration and error correction models, this thesis investigates whether or not there is evidence of causation between economic growth and exchange rate in the long and short terms. The boundary testing (or ARDL) cointegration method was created by Pesaran et al. (2001) to empirically examine the long-run relationships and dynamic interplay between key variables. This method of estimating the model was used to probe these interconnections. Unlike the non-linear, three-stage least squares methodology employed in most fiscal response studies, this one can tell the difference between the immediate and long-term consequences of help (2006).

The ARDL methodology is used less frequently because of the following three issues: At first glance, the border testing process seems straightforward. It allows the cointegration relationship to be estimated with ordinary least squares (OLS) when the lag order of the model is known, which is an advantage over prior approaches for multivariate cointegration like Johansen and Juselius. This method of evaluating model variables for unit roots does not require the limits pre-testing, in contrast to processes like the Johansen approach.

It holds true whether the model's regressors are pure I (0), pure I (1), or mutually cointegrated. Third, given low sample volumes, the test is substantially more effective. In order to test for the presence of a long-term relationship between the variables, the first step in the ARDL bounds testing approach is to estimate the equation of the VECM by OLS and then perform a F test for the joint significance of the coefficients of the variables' lagged levels. i.e., the stationarity status of all variables can be estimated as a second step, and then their order of integration can be determined. Magnus FJ, Fosu OAE (2006) The results demonstrate the calculated ARDL F-statistic, 6.605651, is higher than EViews 12's 1%, 5%, and 10% upper critical limits. Because the computed F-statistic is greater than this upper limit critical value, the null hypothesis of no co-integration is rejected. In other words, the model's variables are linked over the long term. Table 4.3 displays the results of the ARDL short- and long-run tests, indicating a long- and short-run link between the variables. FDI is

statistically significant and has a positive influence on the Ghanaian economy; a 1% increase in FDI inflows into the Ghanaian economy boosts short-term economic growth by 0.860% and long-term economic development by 1.019%. This result is in line with the research on the correlation between FDI and GDP growth in Ghana from 1980 to 2010 conducted by Antwi, Mills, and Zhao4 (2013. Percentages of GDP are used to measure a wide range of economic indicators, including GDP, GDP growth rate, GNP, industry value added, net FDI inflows, inflation, trade, external debt stock, and manufacturing value added (FDI ratio). Our empirical analysis used ordinary least squares (OLS) regressions, including data on FDI and other variables collected annually from 1980 to 2010. We looked at numbers from IMF's worldwide financial statistics tables collected each year. The goal of this study is to establish the nature and extent of the linkages between these variables. All of the independent variables GDP, GDPg, GNI, MVA, GDPc, and TRA have an effect on FDI in Ghana, since their corresponding p-values in the t-statistic are less than 5%. The implications of these findings extend to the political sphere, as well as governments and the financial sector. In contrast, inflation and the currency rate have a negative influence on Ghana's economic growth, with inflation being significant and the exchange rate being low. This result was consistent with Agyire-Tettey and Coleman's (2008) investigating the effects of real exchange rate fluctuation on foreign direct investment (FDI) in a small developing nation utilizing a larger data collection, a longer time frame, and a rather rigorous and comprehensive approach like Ghana, data from 1970 to 2002 was utilized as a time series.

Exchange rate volatility was measured using the ARCH and GARCH models, and short- and long-term correlations were evaluated using co-integration and the ECM. While the liberalization process has helped, it has not led to an increase in foreign direct investment (FDI) into Ghana, according to the study's findings. It is also noted that most foreign investors ignore the size of the Ghanaian market when deciding whether or not to invest in the country, despite the fact that both the existing stock of FDI and political determinants are likely to attract FDI. Research of this nature is extremely scarce in Ghana, and this study is notable for moving away from the use of ratios in favor of a more rigorous and comprehensive method to measuring the impact of actual exchange rate risk on FDI. When receiving countries prioritize expanding their export sectors, FDI helps spur economic growth. However, this is not the case for

countries that focus on reducing their reliance on foreign imports.

Recommendations

Due to the practically complete self-determination of exchange rate volatility, unchecked interventions might also aggravate volatility, but it may also cost term of productivity and welfare. Improving central bank exchange rate forecasting and modeling, as well as integrating the influence of asset prices into national monetary strategy, might enhance both the foreign exchange market's functioning and transparency. As a result, the thesis suggests that Ghana's existing flexible exchange rate be supported by policies that are more explicit in luring FDI inflows. Again, the report advises policymakers to strengthen Ghana's current democratic process in order to make the country a favored location for FDI inflows. According to the study's conclusions, policymakers should work to create and maintain an open trade regime in order to control exchange rates and efficiently run their businesses within an FDI-friendly environment. environment. As a result, governments should prioritize human capital development in order to properly integrate the transmission of foreign information and understand the long-run spillover impact. The statistics imply that a real effective exchange rate has a positive shock on both growth and foreign direct investment; therefore policymakers should aim to maintain a competitive exchange rate to draw in more FDI. To help stabilize and make the exchange rate more competitive, for instance, authorities should develop realistic monetary and fiscal policies, such as an exchange rate targeting strategy, in order to encourage FDI and support the growth of the Ghanaian economy.

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APPENDICES

Appendix 1: Descriptive Statistics

Date: 12/13/22 Time: 16:42
Sample: 1 31

	GDP	FDI	INF	REER
Mean	5.307936	3.915732	21.24987	98.45419
Median	4.700391	3.157000	17.04847	94.61936
Maximum	14.04712	9.466664	54.01291	143.9854
Minimum	0.513942	0.251309	8.481073	67.12236
Std. Dev.	2.537177	2.777037	10.92473	20.45578
Skewness	1.335259	0.476578	1.234294	0.474209
Kurtosis	5.955392	2.025409	4.035635	2.586562
Jarque-Bera	20.49359	2.400349	9.256685	1.382634
Probability	0.000035	0.301142	0.009771	0.500916
Sum	164.5460	121.3877	658.7460	3052.080
Sum Sq. Dev.	193.1180	231.3581	3580.494	12553.17
Observations	31	31	31	31

Appendix 2: Unit Root Tests

ADF Unit Root Test

Null Hypothesis: FDI has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.799865	0.3734
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Null Hypothesis: D(FDI) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.460664	0.0014
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Null Hypothesis: GDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on AIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.988303	0.1518
Test critical values:	1% level	-4.296729	
	5% level	-3.568379	
	10% level	-3.218382	

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

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 4 (Automatic - based on AIC, maxlag=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.227196	0.0137
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

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

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.618348	0.0113
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Null Hypothesis: REER has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.067745	0.2583
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

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

Null Hypothesis: D(REER) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.543714	0.0012
Test critical values:	1% level	-3.679322	
	5% level	-2.967767	
	10% level	-2.622989	

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

Pp unit root test

Null Hypothesis: GDP has a unit root
Exogenous: None
Lag length: 0 (Spectral OLS AR based on AIC, maxlag=7)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.310112	0.1715
Test critical values:	1% level	-2.644302	
	5% level	-1.952473	
	10% level	-1.610211	

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

Null Hypothesis: D(GDP) has a unit root
Exogenous: None
Lag length: 3 (Spectral OLS AR based on AIC, maxlag=7)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-7.840335	0.0000
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	
	10% level	-1.610011	

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

FDI

Null Hypothesis: FDI has a unit root
Exogenous: None
Lag length: 0 (Spectral OLS AR based on AIC, maxlag=7)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-0.764194	0.3767
Test critical values:	1% level	-2.644302	
	5% level	-1.952473	
	10% level	-1.610211	

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

Null Hypothesis: D(FDI) has a unit root
Exogenous: None
Lag length: 0 (Spectral OLS AR based on AIC, maxlag=7)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.546701	0.0001
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	
	10% level	-1.610011	

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

INF

Null Hypothesis: INF has a unit root
Exogenous: Constant
Lag length: 0 (Spectral OLS AR based on AIC, maxlag=7)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-3.618348	0.0113
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

REER

Null Hypothesis: REER has a unit root
Exogenous: None
Lag length: 0 (Spectral OLS AR based on AIC, maxlag=7)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-1.564718	0.1090
Test critical values:	1% level	-2.644302	
	5% level	-1.952473	
	10% level	-1.610211	

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

Null Hypothesis: D(REER) has a unit root
Exogenous: None
Lag length: 0 (Spectral OLS AR based on AIC, maxlag=7)

		Adj. t-Stat	Prob.*
Phillips-Perron test statistic		-4.423710	0.0001
Test critical values:	1% level	-2.647120	
	5% level	-1.952910	
	10% level	-1.610011	

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

Appendix 3: Bond Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	6.605651	10%	3.47	4.45
k	3	5%	4.01	5.07
		2.5%	4.52	5.62
		1%	5.17	6.36

Appendix 4: ARDL Short-Run

ECM Regression
Case 4: Unrestricted Constant and Restricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.94309	2.790440	5.713470	0.0000
D(FDI)	0.860849	0.237617	3.622846	0.0019
D(FDI(-1))	-0.946136	0.264339	-3.579252	0.0021
D(INF)	-0.012568	0.030548	-0.411418	0.6856
D(REER)	0.031389	0.034798	0.902036	0.3790
D(REER(-1))	0.074612	0.038378	1.944138	0.0677
CointEq(-1)*	-0.710115	0.124046	-5.724622	0.0000

Appendix 5: ARDL Long-Run

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.32934	9.096511	1.795121	0.0894
@TREND	-0.386246	0.176374	-2.189921	0.0419
GDP(-1)*	-0.710115	0.191979	-3.698911	0.0016
FDI(-1)	1.019790	0.265427	3.842081	0.0012
INF(-1)	-0.145362	0.064942	-2.238332	0.0381
REER(-1)	-0.072440	0.065372	-1.108123	0.2824
D(FDI)	0.860849	0.300697	2.862849	0.0103
D(FDI(-1))	-0.946136	0.327754	-2.886726	0.0098
D(INF)	-0.012568	0.045740	-0.274771	0.7866
D(REER)	0.031389	0.049516	0.633921	0.5341
D(REER(-1))	0.074612	0.055642	1.340934	0.1966

Levels Equation
Case 5: Unrestricted Constant and Unrestricted Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	1.436092	0.494458	2.904377	0.0095
INF	-0.204702	0.113462	-1.804143	0.0880
REER	-0.102012	0.103811	-0.982668	0.3388

Appendix 6: Pairwise Granger Causality Test

Pairwise Granger Causality Tests
Date: 12/13/22 Time: 16:50
Sample: 1 31
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause GDP	29	2.00496	0.1566
GDP does not Granger Cause FDI		0.05826	0.9435
INF does not Granger Cause GDP	29	0.79619	0.4626
GDP does not Granger Cause INF		2.27921	0.1241
REER does not Granger Cause GDP	29	0.58872	0.5629
GDP does not Granger Cause REER		0.91948	0.4123
INF does not Granger Cause FDI	29	0.47776	0.6259
FDI does not Granger Cause INF		0.07497	0.9280
REER does not Granger Cause FDI	29	1.67109	0.2092
FDI does not Granger Cause REER		0.88691	0.4250
REER does not Granger Cause INF	29	3.58557	0.0434
INF does not Granger Cause REER		2.58109	0.0965

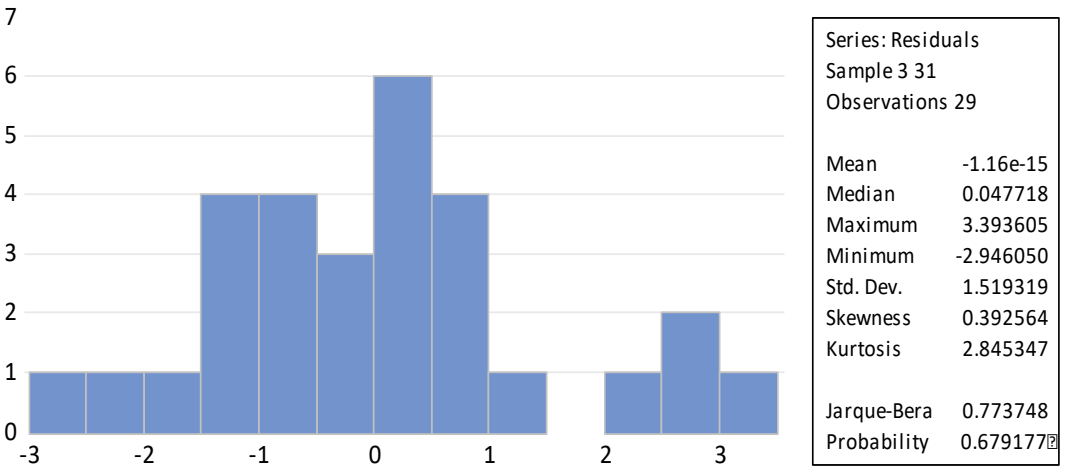
Appendix 7: Breausch-Godfrey Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.936851	Prob. F(2,17)	0.4112
Obs*R-squared	2.779723	Prob. Chi-Square(2)	0.2491

Appendix 8: Breausch-Godfrey Serial Correlation

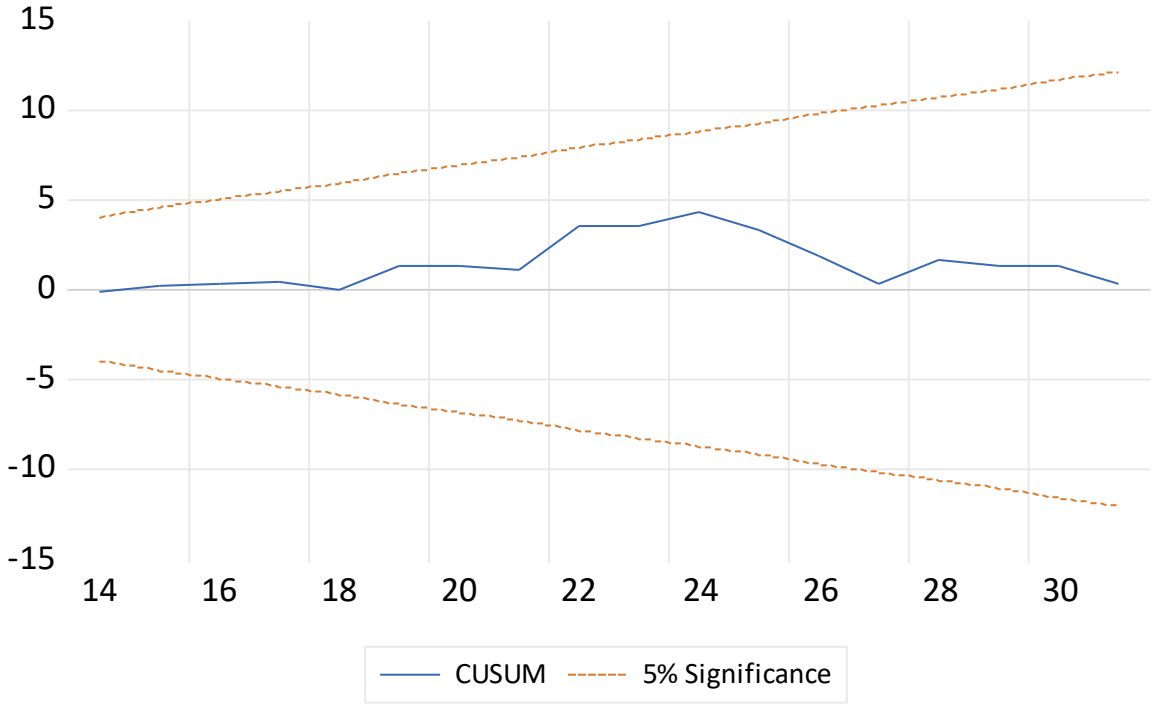


Appendix 9: Heteroskedasticity Test

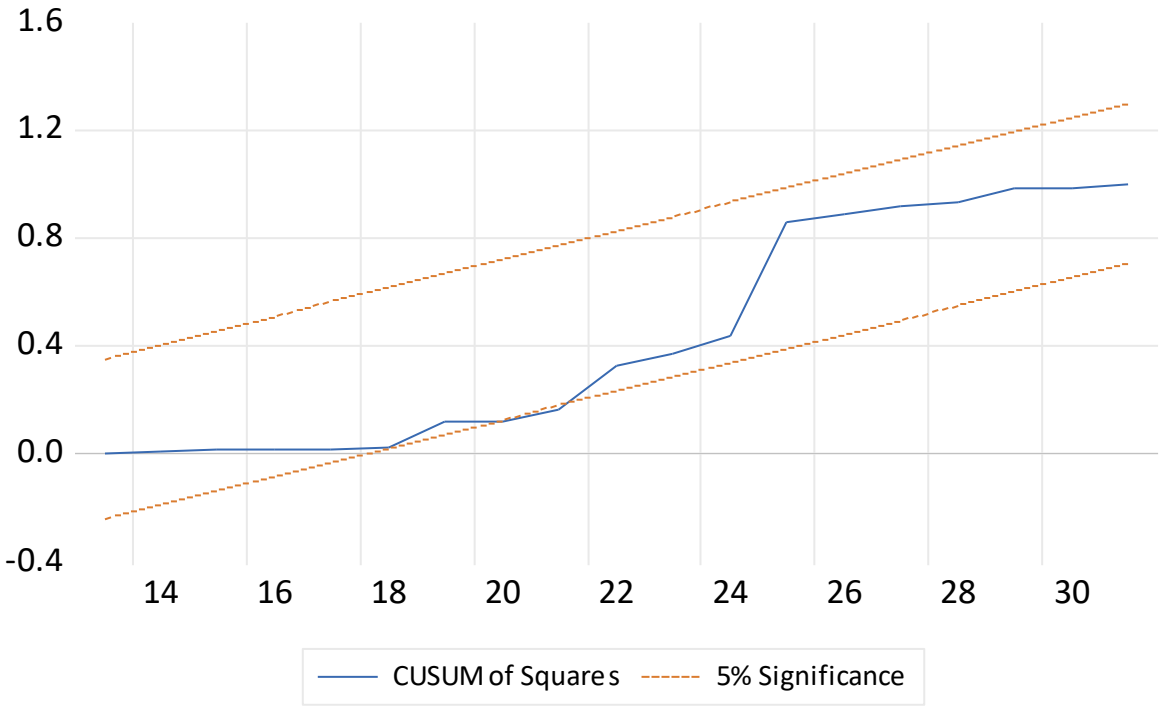
Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.429840	Prob. F(10,18)	0.2444
Obs*R-squared	12.83821	Prob. Chi-Square(10)	0.2329
Scaled explained SS	4.563536	Prob. Chi-Square(10)	0.9184

Appendix 10: Cusum Test

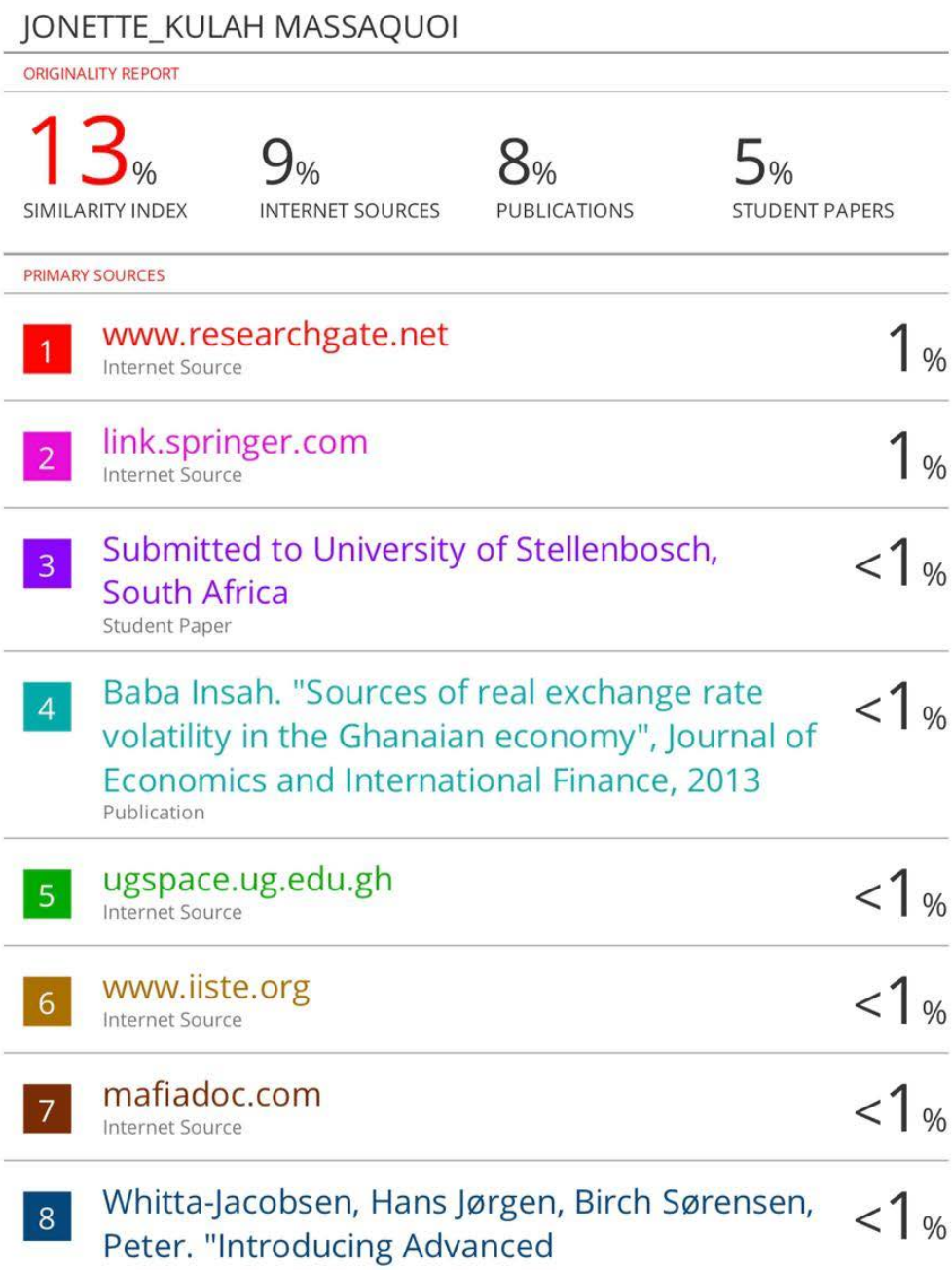


Appendix 11: Cusum of Squares Test



Turnitin Report

Appendix 12: Turnitin Report



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