

UNIVERSITY OF EDUCATION, WINNEBA

Effects of exchange rate on foreign direct investment in Ghana

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**A Dissertation in the Department of Economics Education,
Faculty of Social Sciences, submitted to the School of
Graduate studies in partial fulfillment**

**of the requirements for the award of the degree of
Master of Science
(Economics Education)
in the University of Education, Winneba**

DECEMBER, 2020

DECLARATION

Candidate's Declaration

I PHILIP HOGGAR, hereby declare that this Dissertation, with the exception of quotations and references contained in published works which have all been identified and duly acknowledged, is the results of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Signature:

Date:

Supervisor's Declaration

I hereby declare that the preparation and presentation of the project work were supervised in accordance with the guidelines on supervision of project work laid down by the University of Education, Winneba.

Name of Supervisor: Theophilus E. Richardson (PhD)

Signature:

Date:

DEDICATION

This work is dedicated to the Almighty God and to my parent Mr. R.K. Hoggar and Madam Rejoice Ayitey.

ACKNOWLEDGEMENTS

First of all, I thank the Almighty God for protecting and guiding me safely through good and bad times. His mercies and blessings have kept me alive and he gave me the strength and understanding to work on this project.

Again, I would like to thank my project supervisor, Dr Edward Richardson, for his support and huge contribution to this project. I am also grateful to all lecturers in the department of economics who directly or indirectly contributed to the success of this project and boosting my intellectual capability, I say thank you.

Again, to my lovely family especially my wife, my kids Nana Adjoa, Elorm, Edwin and Etornam, Eyram and all my siblings.

To my good friend Fidelia Etornam Agbemasu, Stella Turkson, H.T. Santhosh Kumar and Samuel Asare, I thank you for your constant contribution and support, may God bless you. And to the entire MSC. Economics Education class, I say thank you.

Finally, I would like to extend a special thanks to my parents for their endless love, support and encouragement given to me. May the Almighty God bless all of you in abundant and give you long life to enjoy the fruit of your labor.

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LIST OF ABBREVIATIONS

ADF	Augmented Dickey Fuller
BoP	Balance of Payment
ERP	Economic Recovery Program
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNP	Gross National Product
IFE	International Fisher Effect
IMF	International Monetary Fund
OLS	Ordinary Least Squares
PPP	Purchasing Power Parity
PNDC	Provisional National Defense Council
REER	Real Effective Exchange Rate
SAP	Structural Adjustment Program
US	United States
VAR	Vector Auto regression
VECM	Vector Error Correction Model
WTO	World Trade Organization

ABSTRACT

Foreign direct investment (FDI) is considered as an engine for economic growth and development in every economy especially developing economies, but there are different forms of barriers that hinder the inflow of such capital investments into every economy. I therefore came to a single conclusion to investigate on the impact, relationships and causal links between foreign direct investment and factors like exchange rate, inflation, gross domestic product, public debt and population. Based on the annual data collected on FDI, GDP, exchange rate, public debt, population and inflation on Ghana from 1975 to 2015, I developed a statistical model in this study to test the effect of changes in exchange rate on foreign direct investment in Ghana. According to results from the empirical test, it showed that exchange rate growth has a negative effect on foreign direct investment (FDI) growth. This implies that a rise in exchange rate leads to a decrease in FDI. The VECM explained that exchange rate growth and FDI growth has a negative long run relationship. Also, from the regression analysis, results explained that growth in GDP, Inflation and public debt had a negative effect on FDI, whereas population growth had a positive effect. This purports that a rise in GDP growth, Inflation and public debt leads to a decrease in FDI and an increase in population leads to an increase in FDI. Granger causality was also applied to test whether FDI growth granger causes exchange rate growth or FDI growth does not granger cause exchange rate growth. The results indicated that there is a bi-causal link between exchange rate growth and FDI growth. This implies that exchange rate growth granger causes FDI growth and FDI growth in turn granger causes exchange rate growth. Hence, the central bank must implement proper and sustainable macroeconomic policies to help adjust exchange rate towards making the economy attractive and suitable for foreign direct investment.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Ghana as a developing country has suffered a lot from economic crisis and shocks since independence. But previous leaders recognized the importance of foreign direct investment (FDI) to the growth and development of our country and hence implemented certain policies to favour the inflow of foreign funds into the country. However subsequent governments devalued our currency several times and as a result, the Ghana cedi had less value in comparison to other foreign currencies which in turn held back investment (SRI international and Service Group, 1989).

The influence of exchange rate on an economy cannot be over-emphasized. The issue becomes more imperative especially for countries that heavily depend on importation of essential commodities such as raw materials for industrial production, crude oil, consumables like food items and clothing and non-consumables including: television sets, vehicles, refrigerators, and to mention a few. Thus, the importation of these commodities can have a significant effect on the domestic currency. The quantum of empirical studies conducted on this macroeconomic variable attest to this assertion (Calderon & Duncan, 2003; Diebold, Husted & Rush, 1991; Abuaf & Jorion, 1990; Sarno & Taylor, 1998; Taylor, 1995; Cheung & Lai, 2001; MacDonald, 1993 in Yemidi, 2010). Due to this, Ghana has embarked on several policies aimed at improving exchange rate situation and for that matter has gone through a number of exchange rate regimes and reforms.

During the Third and Fourth republic, different governments implemented policies that tremendously boosted the flow of foreign funds into the country. The new

investment code implemented by the then government in 1985 was viewed by the investment community as a means of attracting foreign capital into the country (SRI international and Service Group, 1989).

During the ERP (Economic Recovery Program) era, the Government of Ghana took significant steps to pursue flexible (floating) exchange rate policy which was geared towards the liberalisation of trade and exchange regime. Ghana experienced one of its worst GDP growth in 1966 where the economy's GDP grew at a rate of -4.2%. A decade after, the country continued to grow worse, at a point 1975 in time the country's GDP growth rate decreased drastically to -12.4% and the economy collapsed. This economic crisis could be attributed to the economic system (socialist policies) practiced more than two decades after the country gained independence (Culpepper, 2013). The country was not practicing liberalization policies until 1983. The Economic Recovery Program (ERP) along with the Structural Adjustment Program (SAP) which was initiated by the PNDC in 1983 brought the economy from its collapsed state. Ghanaian citizens regained the confidence they lost in themselves and the rest of the world also saw Ghana as an enabling environment for investment.

After the introduction of the ERP and SAP, no African country has stuck to the economic liberalization policies more than Ghana. Many of these policies focus on developing the country through the flow of funds by private entities to partner the government in developing the economy. Evidence of this was in 2011 when Ghana became the fastest growing economy in the world by recording GDP growth rate of 20.1% when measured in current prices in the international currency. Policies instituted by the World Bank and IMF together with series of currency devaluation and small government are responsible for Ghana's recent economic growth (Culpepper, 2013).

The intent of the study is to establish a direct relationship between exchange rate and foreign direct investment (FDI). To this end, the study will focus on the years in which Ghana was practicing socialist and protectionist policies to years in which the country practiced liberalization policies. But we will limit our scope from 1975 to 2015 (41 years) to enhance the efficient analysis of data.

In 1965, the cedi was introduced to replace the pound, at a rate of 2.4 cedis to 1 pound. The first cedi was replaced in 1967 which allowed for a decimal conversion with the pound. At that time the cedi was pegged against the British pound at 2 cedis to 1 pound. After some months, the second cedi was devalued at a rate of 2.45 cedis to 1 pound. At the same time the equivalent rate of the cedi to the US Dollar was 1 cedi to 0.98 dollars (Bawumia, 2014).

The Ghana Cedi has experience lot of instability after its introduction into the country. Series of policies have been implemented towards stabilization of the currency to gain value on the international market, but the cedi continues to depreciate against some major trading currencies like the US dollar, Euro, Pounds Sterling and the Swiss France. This goes a long way to deter investors from investing in Ghana's economy. In 1988, the country adapted to the flexible exchange rate regime, and since then the Ghana cedi had been experiencing lots of instabilities against other foreign currencies. The question here is; what causes the cedi to fluctuate on the foreign exchange market? And what effect does it have on foreign direct investment? (Bawumia, 2014)

These scholarly writers and several others have come out with the factors contributing to currency depreciation, impacts and suggested remedies to combating exchange rate instability in the Ghanaian economy. The question one may ask therefore is why

exchange rate problems still remain a serious challenge to the economy? This has been a major concern of well-meaning Ghanaians – business executives, those in the academia, consumers, and corporate institutions as well as international bodies such as the International Bank for Reconstruction and Development (the World Bank), International Monetary Fund (IMF), and the likes.

Giancarlo Gandolfo (1998) defines exchange rate as the price of one currency in terms of another. Exchange rate can, therefore, be defined as the price at which a currency can be converted into another. Predominantly, two kinds of exchange rate transactions can be cited – spot and forward. The spot exchange rate transactions involve the immediate (two-day) exchange of bank deposits. On the other hand, forward exchange rate transactions involve the exchange of bank deposits at some specified future date. Exchange rate is an indispensable economic concept to be analysed due to its vehement impacts on the economy in terms of the relative prices of foreign and domestic goods. The Marshall-Lerner condition holds the view that if the absolute sum of the long run export and import demand elasticities is equal to, or greater than one, a balance of trade improvement will eventually emanate as a result of exchange rate depreciation (Giancarlo & Gandolfo, 1998). Intuitively, if the domestic currency fall in value which implies that foreign goods and services are expensive relative to those domestically produced, there will be a positive quantity effect on the balance of trade. This is due to the fact that both domestic and foreign consumers will increase their demand for locally manufactured goods and services. Invariably, this consumer behaviour will lead to a reduction in the volume of imports and a rise in export.

1.2 Statement of the Problem

Every country desire to have a stable currency. If the currency of the country is stable, investors can plan ahead without having fear of losing their capital. Hence a stable currency will instill confidence in the market setting. When a country faces instability in its currency, it affects several of economic variables such as interest rate, capital flow, economic performance, trade, productivity. etc. Changes in the Cedi exchange rate has been a historical economic problem over decades. Past governments have tried to provide solutions to this dilemma but have failed and every fiscal year the cedi continues to depreciate against the major trading currencies which affect businesses and economic performance negatively due to the country's huge reliance on imports rather than exports and low level of domestic productivity. Moreover, this could lead to a total loss of confidence in the economy which will in turn lead to a decline in investment and losses in trade to the Ghanaian economy. Depreciation of a currency will attract foreign capital inflows because it lowers the cost of doing business in the country whilst appreciation on the other hand may deter foreign capital inflows due to the high cost of investing in such country. Exchange rate is therefore considered as one major factor that affects total investment in an economy. (Mensah, 2014)

Based on a study conducted by Tsikata et al. (2000), Foreign Direct Investment (FDI) is noted to be influenced by inflation, the openness of an economy, exchange rate volatility, democracy and trade to mention a few. However, studies on the links between exchange rate and FDI flows are scanty and inconclusive, thus suggesting room for the reappraisal of the links in the context of the competing theories of FDI and exchange rate, with a focus on Ghana.

1.3 Objectives of the Study

The main objective

- The main objective of the study is to examine the effects of exchange rate changes on Foreign Direct Investment (FDI).

Specific Objectives:

- To examine the long run and the short-run relationship between exchange rate changes and FDI.
- To identify the other factors that contribute to the determination of FDI.
- To analyze the causal link between exchange rate changes and FDI.

1.4 Research Questions and Hypothesis

From my research study, I came up with these questions:

- Does exchange rate changes have any effect on FDI?
- What is the short run and long run relationship between exchange rate and FDI?
- What other factors affect FDI apart from exchange rate?
- What is the causal link between exchange rate and FDI?

1.5 Scope of the Study

This study is being conducted on Ghana, a country in the sub-Saharan Africa. The major economic variables which the study covers are Foreign Direct Investment (FDI) and exchange rate.

The goal of the study is to evaluate how exchange rate volatility affects FDI which contributes greatly to growth in the economy.

The study covers years in which the country practiced floating exchange rate (1983-date). But due to time, data and other constraints I limited our study from (1975-2015) thus a period of twenty (41) years.

1.6 Significance of the Study

In the first quarter of year 2020, Bloomberg, a privately held financial, software, data and media company with headquarters at New York City reported that “Ghana’s cedi is headed for its 25th straight year of depreciation against the dollar as the government’s fiscal challenges erode investor confidence in the currency of the world’s second-biggest cocoa producer”. Therefore, this issue can be classified as high profile for the country and with wide public awareness because of the series of exchange rate changes that have occurred for more than two decades and still continues to occur. Hence the question on the role of FDI and exchange rate in the development of the country is very fundamental. Ghana for decades has experienced series of currency fluctuations and has therefore devaluated its currency for several times and in the long-run, this problem affects investment which is one major engine to economic growth and development in every economy.

Evidence has also shown that developing countries share of FDI has increased from 5% in 1980 to 36% in 2004 (UNCTAD, 2005). Hence FDI is viewed as a major source of capital and contributor to economic growth and development especially in developing and less developing countries. This study will bring out certain facts on the effects that the constant exchange rate fluctuations has on the economy and also why the inflow of FDI should be greatly encouraged. The study is to draw attention of Ghanaians on how FDI is important to the development of the country and also give certain recommendations on how to encourage and increase the stock of FDI in the Ghanaian economy. It is also to help investors and businesses know the effects that

exchange rate changes have on their investment and help them make appropriate decisions.

Again, according to economic theories, international capital inflows promote the efficient allocation of resources which will improve the well-being of nation's citizens. It has been suggested that the presence of FDI generates positive externalities such as improvement in human capital, infrastructures, new technologies and local institutions (UNCTAD, 2005)

1.7 Organization of the Study

This research is outlined in five chapters;

The dissertation work is organized into five main chapters where in this case, each of the chapters presents and discusses a unique aspect of the entire dissertation. The first chapter comprised of the background of the study, problem statement, research objectives, research questions, significance of the study and the organization of the dissertation. The chapter two also consists of the review of the related relevant literature organized in the study. This literature review constituted the theoretical review and empirical review on relevant areas bothering on exchange rate, foreign direct investment, economic growth and their relationships. This chapter is closely followed by the chapter three which discusses the methodology and research design employed in the study. The methodology presents the type of study, research design, theoretical model use, and type of data used, source of data, measurement of variable, and the econometric estimation procedures employed. Similarly, chapter four presents the results and discussions of the findings that emerged from the study. The chapter also presents the various diagnostic tests, unit root analysis, cointegration analysis and granger causality tests performed. Again, the results of the various hypotheses proposed in the study have been presented in the chapter four.

The final chapter is chapter five which constitute the concluding part of the dissertation work. This final chapter five covers the summary of the findings, key findings, conclusions and recommendations of the study. The recommendations are given based on the findings and conclusions and their policy implications are also emphasized in the chapter.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter presents the relevant theoretical and empirical literatures on the linkage between exchange rate and FDI. Already existing literatures are reviewed from two different perspectives. The first section explores the theoretical framework of the study, the second section examines empirical literature of interest to the topic, and a conclusion is drawn from both the theoretical and empirical literatures. However basic definitive concepts are explained in this section as well. Also, associations and trends between exchange rate and FDI are elaborated on.

2.1 Overview of the Literature on FDI and Exchange Rate

Foreign Direct Investment (FDI)

A foreign investor is defined here as a person, company, group of companies that brings in funds from abroad to finance some form of productive activity in the domestic country (Institute of Economic Affairs, 2005). This definition therefore rules out people who come into the country to engage in petty trade or speculative activities. This definition also rules out individuals or groups who come to provide temporary services. FDI is generally involved with equity investment, thus owning business in a domestic country. FDI is classified in two forms;

1. **Inward FDI** this occurs when foreign capital is invested in local resources. Factors' propelling the growth of inward FDI includes tax breaks, low interest rates, grants etc.
2. **Outward FDI** is also referred to as a direct investment abroad. Thus, firms and individuals in the domestic country expand their businesses to other countries.

Therefore, **Net FDI** equals inward FDI minus outward FDI.

Foreign direct investment (FDI) is also distinguished from foreign portfolio investment (FPI); thus, investment in stock or shares in a local country's financial market. This means FPI investors can enter the stock market and also withdraw from it easily, but FDI investors cannot enter and exit that easily. Hence FDI is considered to be more stable because they are long term investments, whereas FPI is considered less stable and are usually on short term basis. Government therefore does not consider FPI because it doesn't contribute to economic growth.

2.2 Foreign Direct Investment, Dual Gap Model and Economic Development

The gap models have been used to analyze a number of important subjects such as FDI to developing countries.

Following the work of Chenery and Strout (1966) the gap models have been used to analyze the inflow of financial resources to developing countries. Developing countries are characterized by features of minimal per capita income and limited savings that literally translates to inadequate investment domestically (Jaspersen et al., 2000; Lee & Sami, 2019). The gaps of investment can be explained thereby, as savings which is insufficient to meet investment demands. Skill and technology for developing economies are equally deficient factors of production and this limits investment capability in the economies, thereby restricting ability to attain required level of domestic engagement economically (Ullah et al., 2014). Also, a higher volume of import compared to export creates a foreign exchange gap.

The skills and savings gap, coupled with the foreign exchange gap, creates the need for foreign assistance influx to augment the limits of factors of production. The impending restrictions of foreign exchange, human capital skills and investment,

could be temporarily relaxed by inflow of foreign assistance, to substitute for lacking local production factors. This thereby results in an increase in total output, which gradually increase limited factors of production. It would consequently reduce dependence on foreign capital, and thus result into economic development (Bakare Aremu & Bashorun, 2014). FDI net inflow is also expected to reduce the limit of scarce production factors, increase total productivity, thereby gradually increasing income per capita. These increases gradually boost domestic investment, which is needed to attain increased national output and economic development.

Weisskopf (1972) stresses that external capital inflows are addition to the supply of resources to an economy and these flows increase the potential magnitude of internal expenditures in the economy. Luka and Spatafora (2012) analyze the determinants of, and relations between, capital inflows, domestic credit, and domestic investment in developing economies during the period of 2001-2007. Cross-sectional and panel methods discover that reductions in the world price of risk and in domestic cost of borrowing are the major source of increase in net capital inflows and domestic credit. The study suggests that both net capital inflows and domestic credit has positive impact on investment.

The Foreign Direct Investment (FDI) net inflow enhances investment if sustained, it increases growth and per capita income. This subsequently would bring about a rise in the degree of savings domestically and likewise acceleration of domestic resource, thereby gradually closing the savings gap. This would create a resultant effect of reducing dependence on FDI and thereby bring about development of the economy. However, for Africa, the gaps are becoming incessantly wider instead of closing up as experienced by other developing regions like Asia, Europe and Latin America. The desired sustained increase in income growth and by proxy income per capita is not

achieved to lead to the anticipated increased savings and investment. This will make economic development farfetched, as FDI does not successfully substitute for the limited local factors to permit increase in total output, but rather witnessing continuous capital needs for these economies (Chenery & Stout, 1966; Easterly, 1999; Garcia Molina & Ruiz-Tavera, 2009).

Todaro and Smith (2012) opine that FDI inflows to developing countries have remained a small fraction of these countries' total investment, most of which is accounted for by domestic sources. Nevertheless, in recent years, FDI has become the largest source of foreign funds flowing to developing countries

Devereux and Engel (1999) studied the welfare impact of fixed and floating ERRs in the presence of a stylized form of FDI. Their study was one of the pioneering attempts at exploring this relationship. Some experts capture the linkage between exchange rate and FDI by arguing that stronger FDI implications from exchange rate movements are due to relative wage variations that are unanticipated in the expected costs of project finance for FDI.

Some endogenous growth theorists such as Romer (1990) and Grossman *et al.* (1991) have developed growth models within the endogenous growth theory to explain the relationship between FDI and growth. These models assume that technological progress is the principal driving force of economic growth. The theories focus on the creation of technological knowledge and its transfer, and view innovation as major engines for growth. Therefore, these models place emphasis on how human capital accumulation and externalities contributes to growth. In this regard growth rate of developing economies is seen to be reliant on the extent to which these countries can adopt, adapt and utilize innovative technologies which are already available in highly

developed economies. They argue that FDI is the main channel for the advancement in technology in developing countries. Developing countries generally are not able to innovate and generate new technologies. Therefore, developing countries have to channel technologies that already exist in advanced countries through FDI. The new growth theories indicate bidirectional causality between FDI and growth. This is because FDI is expected to contribute greatly towards improving economic growth by encouraging the incorporation of new inputs and foreign technologies in the production function of the beneficiary country. In addition, FDI enhances growth by adding to the host country existing knowledge base through human resource training and development. Also, FDI increases competition in the host country by overcoming entry barriers and reducing the market power of existing firms (Dunning 1993; Blomstrom et al., 1996; Borensztein et al., 1998; De Mello, 1999).

Hence the endogenous growth theory explains how FDI channels innovative technologies and knowledge-based concepts from developed nations to developing nations to speed up economic growth. The main argument of this theory states that FDI brings about capital accumulation, human capital development, advances in technologies and helps utilize abundant resources in developing countries. The theory therefore elucidates that FDI is an engine to economic growth and development in developing economies.

Production cycle theory developed by (Vernon, 1966) was used to explain certain types of foreign direct investment made by U.S. companies in Western Europe after the World War II in the manufacturing industry. Vernon believes that there are four stages of production cycle: 1. innovation, 2. growth, 3. maturity and 4. decline. According to Vernon, in the first stage the U.S. transnational companies create new

innovative products for local consumption and export the surplus in order to serve the foreign markets. According to the theory of production cycle, after World War II Europe has increased demand for manufactured products, especially those produced in USA. Having an advantage in technology over international competitors, American firms began to export more. If in the first stage of the production cycle, manufacturers have an advantage by owning new technologies, as the product develops the technology becomes known. Manufacturers will standardize the product, but there will be other companies that will also imitate it. Therefore, European firms started imitating American products that U.S. firms were exporting to these countries. US companies were forced to establish their production facilities on the local markets to maintain their market shares in those areas. This theory managed to explain certain types of investments in Western Europe made by U.S. companies from 1950-1970. Although there are areas where Americans do not possess the technological advantage but foreign direct investments were made during those periods.

This theory is subjected to growth of companies and how this growth will lead to F.D.I. In this theory the first three stages being innovation, growth, maturity enables companies to expand production and allow them export their goods to other countries. Innovation and growth will imply a competitive advantage in the world market and easily allow such companies to establish themselves in foreign nations. As more and more of such activities continue others will imitate products being produced and fight for market share. At this point FDI companies may have reached their maturity stage and will try to maintain their standard and those who are not able to compete will be subjected to the final stage in the theory which is decline.

Some Determinants of FDI

According to a study conducted by Nunnenkamp (2002), on the determinants of FDI in developing countries and how globalization has changed the rules of the game, he indicated that globalization induces changes in international competition for FDI. According to his study, he classified the determinants of FDI into two, thus traditional and non-traditional. However, he stated that the traditional market-related determinants are dominant factors in determining FDI, but they are affected by globalization. He further clarified that among the non-traditional FDI determinants only the availability of local skills has clearly gained importance. The classifications into **traditional and non-traditional determinants** are as follows;

The following variables are considered **traditional determinants**: Population of host countries, GDP per capita in host countries, GDP growth of host countries, Administrative bottlenecks, Entry restrictions etc.

The following are considered **non-traditional determinants**:

Complementary factors of production, i.e. local inputs required for an internationally competitive production in developing host countries, Average years of schooling, drawn from (Barro et al., 2000), in order to assess more accurately one particular complementary factor of production, namely the availability of sufficiently qualified labor in host countries, Cost factors: relating to taxes, employment conditions, labor market regulations and the leverage of trade unions, Restrictions of foreign trade, which may impede an internationally competitive production in developing host countries, The change in trade shares, which provides an alternative proxy of opening up to trade by host countries (based on actual trade data, instead of survey results on trade restrictions) etc

He further stated that the following variables **are not easily classified** as traditional or non-traditional. This applies to:

Post-entry restrictions, some of which may discourage all foreign investors whereas other restrictions (notably performance requirements) may discourage efficiency-seeking FDI more than purely market-seeking FDI.

Technology related regulations, which may be as multi-faceted as post-entry restrictions.

Foreign direct investment is therefore considered to be more useful to a country than FII investments. This is because FPI is seen as potentially "hot money" which can leave at the first sign of trouble, whereas FDI is durable and generally useful whether things go well or badly. Due to globalization, the inflow of FDI into developing economies has changed over the past decades.

The Advantages of FDI

The major benefits of FDI are outlined as follows.

First, it stimulates economic development. Foreign direct investment can stimulate the target country's economic development, creating a more conducive environment for you as the investor and benefits for the local industry.

Also, it promotes employment and economic boost. Foreign direct investment creates new jobs, as investors build new companies in the target country, create new opportunities. This leads to an increase in income and more buying power to the people, which in turn leads to an economic boost.

Thirdly, development of human capital resources One big advantage brought about by FDI is the development of human capital resources, which is also often understated as it is not immediately apparent. Human capital is the competence and knowledge of

those able to perform labor, more known to us as the workforce. The attributes gained by training and sharing experience would increase the education and overall human capital of a country. Its resource is not a tangible asset that is owned by companies, but instead something that is on loan. With this in mind, a country with FDI can benefit greatly by developing its human resources while maintaining ownership.

Fourthly it also allows resource transfer. Foreign direct investment will allow resource transfer and other exchanges of knowledge, where various countries are given access to new technologies and skills.

Again, FDI helps to Increased Productivity. The facilities and equipment provided by foreign investors can increase a workforce's productivity in the target country.

It promotes increment in income. Another big advantage of foreign direct investment is the increase of the target country's income. With more jobs and higher wages, the national income normally increases. As a result, economic growth is spurred. Take note that larger corporations would usually offer higher salary levels than what you would normally find in the target country, which can lead to increment in income. FDI brings in new technology which enhances productivity and increases exports.

The Disadvantages of FDI

However, FDI inflows have been criticized for the following reasons.

First, the displacement of local businesses. The entry of large firms, may displace local businesses that cannot compete with its lower prices. Secondly, it leads to profit repatriation. In the case of profit repatriation, the primary concern is that firms will not invest profit back into the host country. This leads to large capital outflows from the host country.

An investor will also be confronted with risk from political changes. Because political issues in the target countries can instantly change, foreign direct investment is very risky. Plus, most of the risk factors that you are going to experience are extremely high.

It has negative influence on exchange rates. Foreign direct investments can occasionally affect exchange rates to the advantage of one country and the detriment of another.

It leads to expropriation. Remember that political changes in the target country can also lead to expropriation, which is a scenario where the government will have control over your property and assets.

It impacts negatively on the Country's Investment. The rules that govern foreign exchange rates and direct investments might negatively have an impact on the investing country. Investment may be banned in some foreign markets, which means that it is impossible to pursue an inviting opportunity.

Again, it leads to modern-day economic colonialism. Many third-world countries, or at least those with history of colonialism, worry that foreign direct investment would result in some kind of modern-day economic colonialism, which exposes host countries and leave them vulnerable to foreign companies' exploitations.

Investing into another country's economy, buying into a foreign company or otherwise expanding your business abroad can be extremely financially rewarding and might provide you with the boost needed to jump to a new level of success. However, foreign direct investment also carries risks, and it is highly important for you to evaluate the economic climate thoroughly before doing it. Also, it is essential to hire a financial expert who is accustomed to working internationally, as he can give you a

clear view of the prevailing economic landscape in your target country. He can even help you monitor market stability and predict future growth.

Remember that we live in an increasingly globalized economy, so foreign direct investment will become a more accessible option for you when it comes to business. However, you should weigh down its advantages and disadvantages first to know if it is the best road to take.

2.3 The Exchange Rate

Currency fluctuations are natural outcomes of the floating exchange rate system which is the norm for most countries. The value of the cedi, like any traded good or service depends on the demand and supply. Hence if there is more demand for dollar in the domestic currency market and it is not adequately matched by supply, other things being equal, the cedi price for dollar will go up or the cedi will depreciate. Conversely, if the supply of dollar is higher than the demand, the cedi will appreciate. We are referring to the dollar, as it is the most preferred strong currency for cross border transactions. The rate of exchange generally reflects the purchasing power of one currency relative to another currency. Apart from the demand and supply pressures, currency values fluctuate for a wide variety of reasons such as investors' view of a nation's economic health, speculation, natural disasters, government actions, war, external or global shocks etc. (Stouff, 2010).

The supply and demand for dollars depends on two factors, thus export, import (XM) and investment. When goods are exported, the exporter receives the payment in dollars, boosting the supply of dollars into the domestic country. On the other hand, if individuals or companies buy goods and services abroad, they need dollars to settle the bills leading to an increased demand for dollars. If a country exports more than it

imports, its currency will tend to appreciate and when a country imports more than it exports, its currency will tend to depreciate. Currency fluctuation can have a wide-ranging impact not just on a domestic economy, but also on the global economy as well. Investors can use such moves to their advantage by investing overseas or in U.S. multinationals when the greenback is weak.

Analysis of Exchange Rate Dynamism

As noted earlier, exchange rate is a price and its determination is accounted for by several forces in the flexible exchange rate market. The quantity demanded of a currency inversely relates to its price but a direct relationship exists between quantity supplied of a currency and its price. Like any other market, equilibrium is attained when quantity supplied equates the quantity demanded of the currency say the Dollar in the Ghanaian economy. A change in factors such as productivity, preference, tariffs and quota, investment capital and the rest will cause the rate of exchange to rise or fall.

2.4 Purchasing Power Parity (PPP) Theory

Developed by a Swedish economist Gustav Cassel (1918), it is an economic theory that argues price levels between two countries should be equivalent to one another after exchange-rate adjustment. It elaborates an equilibrium exchange rate such that two currencies purchase the same amount of identical goods and services in the two economies. The basis of this theory is the law of one price, where the cost of an identical good should be the same around the world. The first original reference of PPP theory was made by David Ricardo. However, Gustav Cassel popularized this theory in 1918. According to PPP theory, when exchange rates are of a fluctuating

nature, the rate of exchange between two currencies in the long run will be fixed by their respective purchasing powers in their own nations.

The **absolute form of PPP**, or the “**law of one price**,” suggests that similar products in different countries should be equally priced when measured in the same currency.

The **relative form of PPP** accounts for market imperfections like transportation costs, tariffs, and quotas. It states that the rate of price changes should be similar.

Foreign currency is demanded by individuals because it has some purchasing power in its own nation. Also, domestic currency has a certain purchasing power, because it can buy some amount of goods/services in the domestic economy. Thus, when home currency is exchanged for any foreign currency, in fact the domestic purchasing power is being exchanged for the purchasing power of that foreign currency. This is because the home currency can also buy some amount of goods/ services in the domestic economy. Thus, the relative purchasing power of the two currencies determines the exchange rate. The exchange rate under this theory is in equilibrium when the domestic purchasing powers of two countries' currencies at a specific rate of exchanges are equivalent. Therefore, the Purchasing Power Parity (PPP) model assumes relative rates of inflation between two countries as the major determinant of the future spot exchange rate. **PPP may not occur consistently due to** Confounding effects; Exchange rates are also affected by differentials in interest rates, income levels, and risk, as well as government controls and lack of substitutes for traded goods.

The Balance of Payment Theory (BoP)

The monetary approach to BoP was first outlined in the treatment by Hahn (1959) and further developed by Mundell (1968), Johnson (1972), Swoboda (1973), Dornbusch (1973), and Mussa (1974). The approach emphasized on the monetary aspect of BoP adjustments under a system of fixed exchange rate rather than relative price and income effect that were the preoccupation of the elasticities approach and formed a major part of the absorption approach. It recognizes the fact that real variables affect BoP and exchange rates but they operate only through monetary channels.

The balance of payments (BoP) of a country is composed of three distinct accounts: the current account, the capital account, and the official international reserves.

1. The **current account** is a statistical record of the trade in goods and services between a country and the rest of the world. The current account consists of the goods balance, the service balance, the income balance, and the unilateral transfer balance.

Goods Balance: (the trade balance) it is a record of trade in goods.

Service Balance: it is a record of all trade in services.

Income Balance: it is a record of all investment income, the flow of earnings from the different forms of direct and portfolio investments made in prior periods.

Unilateral Transfer Balance: it is a record of net transfer payments from abroad with no corresponding flow of goods and services (goodwill).

The capital account is a statistical record of investment flows between a country and the rest of the world.

2. The **capital account** records transactions that result from non-financial and financial assets (both portfolio and direct investment).

Errors and omissions reflect transactions that are known to have occurred but for which no specific measure was made.

3. **Official International Reserves (ΔRFX)**: the net results of the activities in the current account and the capital account must be financed by changes in official monetary reserves.

These accounts reflect changes in reserve assets (gold, foreign currencies, deposits, and securities), use of credit and loans from the IMF (SDRs), liabilities constituting foreign authorities' reserves (changes in private bank liabilities that are held as foreign exchange reserves by central banks of other countries), and exceptional financing.

The balance of payments theory looks at the current account, which is the account dealing with trade of tangible goods, to get an idea of exchange-rate directions. If a country is running a large current account **surplus or deficit**, it is a sign that a country's exchange rate is out of equilibrium. To bring the current account back into equilibrium, the exchange rate will need to adjust over time. If a country is running a large deficit (more imports than exports), the domestic currency will depreciate. On the other hand, a surplus would lead to currency appreciation.

The balance of payment theory measures is used as evidence of pressure on a country's foreign exchange rate. This evidence depends on the light of the foreign exchange rate regime in place. Under a floating exchange rate regime, a country's monetary authorities do not control the valuation of the exchange rate. According to the theory, an imbalance in the BoP will automatically alter the exchange rate in the direction necessary to obtain a balanced BoP. The theory assumes that an appreciation of the domestic currency makes domestic goods and assets more expensive on the international market and implies a downward pressure on the BoP. Also, if there is a BoP surplus, there is an excess demand of domestic currency to purchase these

domestic goods and assets. An appreciation of the home currency makes these goods more expensive and should diminish the excess demand. A balance of payment surplus leads to an appreciation of a home currency and a BoP deficit leads to a depreciation of the home currency. To conclude, BoP theory affects currency fluctuation and F.D.I. through trade. Thus, when there are trade imbalances it could cause a currency to either depreciate or appreciate which could encourage investors to patronize domestic assets or deter them from investing depending on how cheap or expensive the assets would be in the domestic economy. (Lene, 2000).

The International Fisher Effect (IFE) Theory

The International Fisher Effect (IFE) Theory put forward by Irving Fisher suggested that nominal risk free interest rate contains a real rate of return and an anticipated inflation, his theory suggested that currencies with high interest rate will depreciate because the higher interest rate reflect higher expected inflation and vice versa. Thus, the exchange rate between two countries should change by an amount similar to the difference between their nominal interest rates. If the nominal rate in one country is lower than another, the currency of the country with the lower nominal rate should appreciate against the higher rate country by the same amount. The IFE is based on the analysis of interest rates associated with present and future risk-free investments, such as treasuries, and is used to help predict currency movements. This is in contrast to other methods that solely use inflation rates in the prediction of exchange rate changes, instead functioning as a combined view relating inflation and interest rates to a currencies appreciation or depreciation.

The annual depreciation of a currency will be equal to the observed interest rate differential. However, the annual appreciation of the currency will be equal to the observed interest rate differential. Therefore, investors who are hoping to take advantage of higher foreign interest rate currency would earn a return not better than what they would have actually earned domestically. Hence, the IFE theory uses market interest rates rather than inflation rates to explain why exchange rates changes over time. Changes in exchange rates are related to differences in market interest rates between countries. This is because the difference in interest rates between countries reflects the differences in their inflationary rates, since inflation is said to be one of the major determinants of exchange rates. (Madura, 2013)

To end it, the IFE theory concludes and explains that when interest rates are low or high, it causes a currency to appreciate or depreciate respectively. When the interest rates are low, it normally attracts investment and when they are higher it deters investment because of inflationary expectations.

Conclusion

As seen above in the relative version, the PPP theory uses the price index in order to measure the changes in the equilibrium rate of exchange. However, price indices suffer from various limitations and thus the theory too. In addition, the balance of payment theory talks about the balance of payment of a country, in terms of trade (current account). When a country faces a trade deficit or surplus from its B.O.P it will lead to a currency fluctuation. The relevance of this theory to our work is the relationship between currency fluctuation and balance of payment and how this relationship affects the flow of FDI Finally, the view on the International Fisher theory is that, it solely uses inflation rate in the prediction of exchange rate while that is not the only determinants of currency fluctuation.

2.5 Empirical Framework

Exchange Rates and Foreign Direct Investment (FDI)

A research was conducted by Bilawal et al (2014) on the impact of Exchange Rate on Foreign Direct Investment (FDI) in Pakistan. They used only secondary data and time series to investigate the impacts of exchange rate on FDI on Pakistan within a period of 32 years (1982-2013). Their correlation results showed that there is a positive significant relationship between exchange and FDI. They chose co-relational study because they were interested in delineating the important variables associated with the problem.

Another research was undertaken by Zhang, et al. (2013) on the impact of exchange rate on Foreign Direct Investment (FDI); evidence from China, for a period of 16years. They established a simple model of two (2) variables that is FDI in China and Real Effective Exchange Rate (REER). They run an OLS (Ordinary least squares) to test the linearity of the two (2) time series and the ADF test to check the stationarity of the two (2) time series. If the two (2) time series are not co-integrated they will use the VAR approach. The results of their OLS indicated that there is a statistically significance between the two variables. They used the AIC criteria to determine that lag3 is the optimal lag length of VAR model. They then estimated the VAR by using the optimal lag length and got some results from the granger causality test. According to their results, the change in FDI can cause a change in REER significantly in the long run. However, a change in REER will cause a change in FDI at 10% statistical level even though this causality is not significant at 5% level.

Further, a research was conducted by Chowdury, et.al (2016) on the effects of currency fluctuation on FDI; a study with respect to India. They used the non-linear regression for a better measurement of data. They also collected data from secondary

sources. Their study was to find the relationship between FDI and currency fluctuation. The non-linear regression they used explained a high causal relationship indicating a high Rsquare hence they concluded that currency fluctuation has an impact on FDI.

Accam (1997) using OLS estimation for 20 LDCs employed the standard deviation of the exchange rate as a proxy for instability and found a negative significant relationship between exchange rate uncertainty and FDI for the study period.

Agodo (1978) with data on 33 US private manufacturing firms with 46 investments in Africa discovered the domestic market size, the raw materials endowment, availability of primary infrastructure and political stability as drivers of FDI in Africa in the 1960s.

Artige and Nicolini (2005) analysed FDI inflows into a group of European regions with disaggregated data. They found that in spite of regional economic similarities FDI flows rely on a combination of factor endowments, lags in diffusion of innovations, demand considerations, role of governments, economies of scale and international capital mobility inter alia.

Bailey and Tavlas (1991) like Cushman (1985) established that higher exchange rate volatility explains FDI flows from the US to Canada, France, Germany and Japan.

However, Barrell and Pain (1996) using a dummy for exchange rate controls in a profit-maximising regression model affirmed that expected appreciation in the dollar temporarily postponed US outward FDI flows within their study period.

Gyasi, Asante and Tsikata (2000) with OLS supplemented by a firm level survey also found openness, trade regimes, the investment climate, land, democracy and exchange rates as significant drivers of inward FDI in Ghana.

Elsharif-Suliman (2005) studied the relationship between FDI and exchange rate for twenty low-income countries of the Sub-Saharan Africa. He did use a panel data from 1980 to 2003. The study used the two-Stage Least Squares method, the fixed effects method, the cross-section weights technique (CSW), and the seemingly unrelated regression (SUR) weighted least squares technique, the results show that both real exchange rate and its volatility have influenced the FDI inflows. His findings were consistent with a priori expectations. To him the decision by most of the sub-Saharan African countries pegging their currencies at a fixed rate to the Dollar as an incentive to attract FDI was a move in the right direction because it involves a trade-off between uncertainty and flexibility. The resultant price competitiveness will influence FDI inflows. Although, analysing almost the same relationship, his work differs from the other researcher's for the focus was not on only one country.

Exchange Rate and Foreign Direct Investment

Omankhanlen, (2011) explored the effect of exchange rate on foreign direct investment and its relationship with economic growth in Nigeria using annual time series data between the period 1980 to 2009. Government expenditure and gross fixed capital formation were added as control variables. A linear regression analysis was used on the thirty years data to determine the relationship between exchange rate, FDI inflows and economic growth. The study reveals that exchange rate has no effect on FDI but FDI positively affect economic growth in Nigeria.

Adu-Gyamfi (2011) studied the impact of exchange rate volatility on Ghana's economic growth. Data on time series macroeconomic variables covering the period of 1983 – 2010 were used in his study. As the title of his research suggests, the core objective was to assess the effects of exchange rate movement on the Ghanaian economy. The study employed unit root test, cointegration analysis and error

correction models (ECM) in the determination of short run and long run causal relationships that existed among the variables. In the short run, the study established a significant negative relationship between economic growth and exchange rate volatility but proved otherwise in the long run. This, as admitted by the researcher, was as result of government intervention in the foreign exchange market. The second finding of the study was not consistent with a priori expectations as variables of such nature are believed to show some long run 40 associations. He, also, upon identifying the problems that emanates from instability in exchange rate in Ghana entreated policy makers to formulate measures to curtail the situation but failed to pinpoint any such measures.

FDI and Growth

Edoumiekumo, (2009) employed the Johansen co-integration approach to investigate the relationship between foreign direct investment and economic growth in Nigeria using annual time series data covering the period 1970 to 2007. The study established a positive and significant link between foreign direct investment and growth. The Granger causality test also confirmed a bidirectional causality running between foreign direct investment and growth.

Ogiagah, et. al., (2010) also used the Johansen co-integration approach and the Granger Causality test to consider the linkage between FDI and GDP growth in Nigeria using annual time series data from 1970 to 2007. The study revealed a positive and significant long run relationship between FDI and GDP growth and a unidirectional causality running between GDP and FDI.

Furthermore, Loesse, et al., (2010) examined the linkage and directional causality between FDI and growth of ten Sub-Saharan African countries using annual time series data from 1970 to 2007. They employed the Pesaran, et. al., (2001) approach to

co-integration and the Toda, et. al., (1995) causality test and realized a positive and significant long run relationship between FDI and GDP growth in Angola, Liberia, Kenya and South Africa. However, they found a unidirectional causality running between FDI and GDP growth in these economies.

2.6 Chapter Summary

Based on the above empirical studies, they all used secondary and time series data in their analysis. Also, all the articles expressed a positive relationship between currency fluctuation and FDI as well as FDI and economic growth. Two of the studies by Chowdury, et.al. (2014) and Zhang, et al (2013) used Rsquare to explain changes between the independent variable and the dependent variable. These theories also analyzed the relationship between FDI and growth. They used the co-integration method for their analysis. They also employed the granger causality test to evaluate the causal linkage between FDI and growth. Edoumiekumo, (2009) analysis established a positive and significant link between FDI and growth with a bidirectional causality running from FDI to growth, whereas both studies by Ogiagah et al., (2010) and Loesse, et. al., (2010) revealed a positive but a long-term relationship between FDI and growth with a unidirectional causality running from GDP to FDI. All the three research works analyzed were based on annual time series data. Also, the difference in directional causality could be due to the difference in methodology. Annual time series and panel data may not yield the same results. Lastly the two econometric techniques- Granger causality and Toda and Yamomanto could also yield different results.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the analytical framework for the study. This chapter contains the research design employed for the study, sources of data, model specification and estimation and to some extent the instruments used in collecting data. Furthermore, classifications on how data is collected analyzed and interpreted is included in this session.

3.1 Research Design

According to Grandhi (2004), a research design is the tentative outline of a proposed research work. My research is mainly explanatory because it is aimed to establish a relationship between the exchange rate changes and how it affects FDI. Hence the research is based on the use of quantitative data analysis and employs secondary data for the analysis. Time series data on the different economic variables on Ghanaian economy for a period of 41 years (1975-2015) is collected for analysis. My study will also explain how exchange rate and other macroeconomic variables affected FDI inflows during those periods. I also looked at how the inflow of FDI into the Ghanaian economy contributes to Gross Domestic Product (GDP) and economic growth. Therefore, explanatory research design is the best resort to analyze and interpret the results of my findings.

3.2 Sources of Data

This study employs secondary data. Time series annual data on exchange rate, foreign direct investment, GDP growth, population, inflation and public debt on Ghana over the period 1975 to 2015 are used for the study. This period is chosen to enhance a

better analysis on the selected variables and also enable us establish whether there exists a long-term relationship between the variables or not. The research conducted is highly quantitative in nature. Based on the type of research conducted and the variables employed, I obtained my data from the World Trade Organization (WTO), Bank of Ghana, World Bank, and IMF.

3.3 Data Analysis Technique

In analyzing the data acquired, Granger Causality test, multiple regression model and Vector Error Correction model (co-integration) is used to undertake the analysis. Multiple regression model is used to run the equation to examine the effect of independent variables on the dependent variable. This regression model is chosen because it expresses the relationship between dependent and independent variables and also assumes the relationship between the dependent variable and independent variables as linear, hence the linear equation in figure 3.4. Granger Causality test is used to determine whether the relationship between the changes in exchange rate and foreign direct investment is uni-causal or bi-causal. Vector Error Correction model (co-integration) is also used to estimate both long term and short-term effects between the dependent and independent variables.

3.4 Model Specification and Estimation

3.4.1 Multiple regression model

The fundamental estimating equation in linear form is as follows:

$$\ln\text{FDI} = B_0 + B_1\ln\text{EXR} + B_2\ln\text{INF} + B_3\ln\text{PDT} + B_4\ln\text{POP} + B_5\ln\text{GDP} + e$$

Where:

FDI= foreign direct investment, EXR= exchange rate, INF= inflation,

PDT= Public debt, POP= Population, GDP= gross domestic product, e= error term or stochastic,

B_0 = autonomous or constant.

3.4.2 Vector error correction model (co-integration)

The fundamental estimating equation in linear form is as follows:

$$\ln FDI = B_0 + B_1 \ln EXR + B_2 \ln INF + B_3 \ln PDT + B_4 \ln POP + B_5 \ln GDP + e$$

Where:

FDI= foreign direct investment, EXR= exchange rate, INF= inflation,

PDT= Public debt, POP= Population, GDP= gross domestic product, e= error term or stochastic,

B_0 = autonomous or constant.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction

This section presents the results of the analysis made with the aid of EViews and excel. In this chapter, three econometric models were adopted; multiple regression, granger causality and co-integration. This chapter is concerned with the entry, presentation and analysis of variables to investigate the extent to which exchange rate affects FDI. The results from the data collected are represented in tables and graphs to ensure simplicity and understanding. This chapter therefore presents the outcomes when the econometric models were used to empirically examine the linkage between foreign direct investment and exchange rate in Ghana.

4.1 Findings

In finding the effect of the independent variables on the dependent variables we changed the variables into log form to make our variables stationary. We conducted an ADF Test at first difference to know whether our variables are significant. We omitted the variable population because it was insignificant at first difference but significant at level. After gaining stationarity, we applied a Johansen co-integration test to find out whether there exists a long-term relationship between the variables. From that test one long run relationship emerged. We then conducted a VECM to identify the type of long-term relationship that existed between the variables. A multiple regression was also conducted on all the variables to show how a unit change in the independent variable will affect the dependent variable. Finally, a Granger causality test was conducted to analyze the causal link between exchange rate and FDI.

From our findings and analysis exchange rate had a positive effect on FDI when we run a regression on only FDI and exchange rate and also exchange rate had a negative long run relationship on FDI when VECM was run on all the variables. Our results also showed that population had a positive effect on FDI whereas the other independent variables had a negative effect. For granger causality we rejected the null hypothesis and reported that there exist a causal link between exchange rate and FDI because the P-value was significant.

This chapter therefore presents the results when the above econometric techniques were used to empirically examine the linkages and relationships between FDI, exchange rate, inflation, GDP, Public debt, and population in Ghana from 1975-2015.

4.1.1 Test for stationarity

We conducted a unit root test to investigate whether a time series variable is non-stationary and possesses a unit root. The augmented dickey fuller test (ADF) is an extension of the dickey fuller test (DF test) and we used it to remove all structural effects (autocorrelation) in the time series data and then tested for the unit root using the same procedure. In statistics and econometrics, an ADF tests the null hypothesis of the unit root present in a time series sample. The alternative hypothesis is different depending on which version of the test is used, but is usually stationary or non-stationary. In the ADF statistics, the negative a number the stronger the rejection of the hypothesis that there is a unit roots at some level of confidence.

Table 1: Results of unit root test

Augmented Variable	Unit Root Test Dickey Fuller test (ADF)		
	Level	first diff	
lnFdi	1.83861	-0.904047	*
lnExr	0.91410	-0.555896	*
lnGdp	1.98182	-0.804654	*
lnInf	1.29551	-1.981828	*
lnPdt	0.33072	-1.018180	*

Source: Estimated from Eviews

* means not significant under 1% confidence level

Foreign direct investment, exchange rate, gross domestic product, inflation and public debt are all significant under 1% at first difference.

4.1.2 Graphical Presentations of the Economic Variables

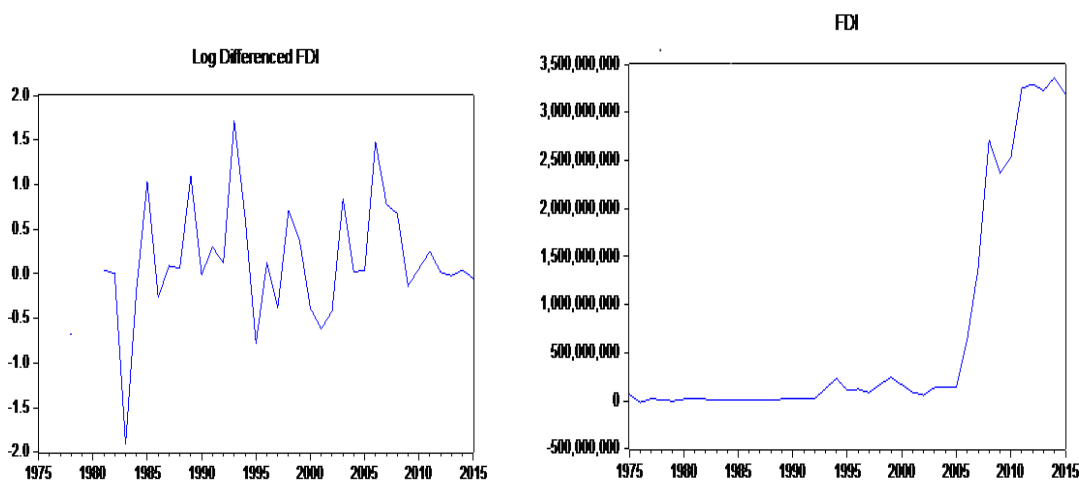


Figure 1: Graphical representation of FDI data at its raw state and at its first difference from 1975 to 2015

Source: Author's computation from World Bank Online Data Base, 2015.

Figure 1 shows a graphical representation of FDI data at its raw state and at its first difference from 1975 to 2015. From 1975 to the 80's, FDI was low because of protectionist policies practiced by various governments. However in 1983 the PNDC government introduced trade liberalization which opened the country's borders for

trade with other countries. FDI grew steadily between the periods 1980 to the early 2000's and increased drastically from 2005 to 2015. The graph on the right hand side shows stationarity in FDI at log difference.

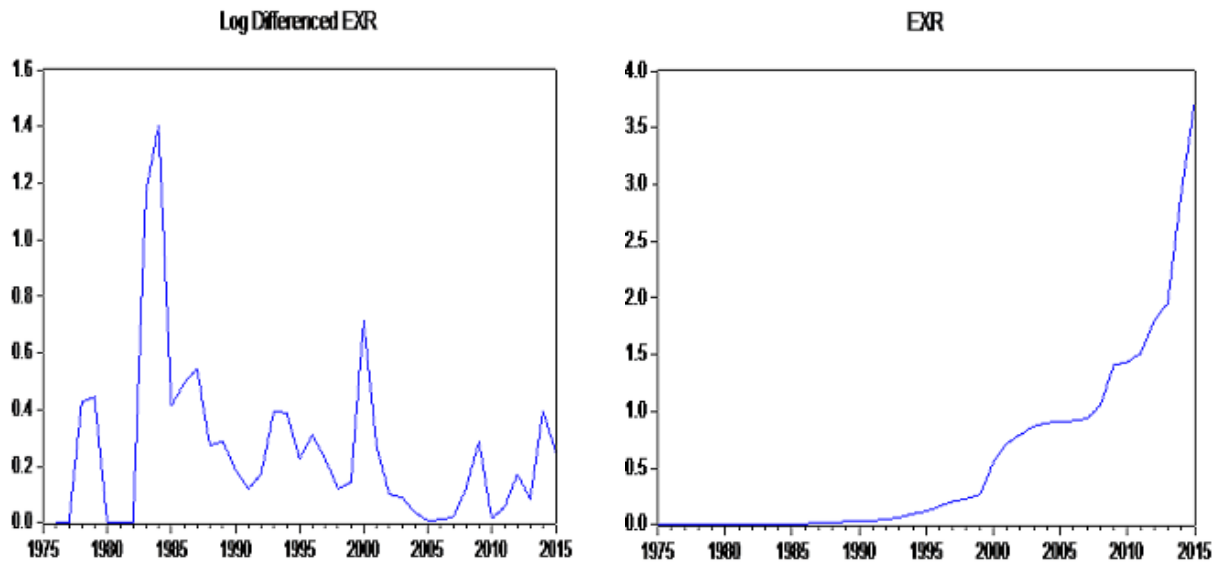


Figure 2: the graphical presentation of exchange rate in Ghana from 1975 to 2015. From the period of 1975 to 1983

Source: Author's computation from World Bank Online Data Base, 2015.

Figure 2 shows the graphical presentation of exchange rate in Ghana from 1975 to 2015. From the period of 1975 to 1983, the cedi rate was constant due to the fixed exchange rate system practiced during that period. After 1983 when the PNDC introduced the floating exchange rate system, the cedi had been fluctuating and has experienced its highest levels of fluctuation from the 2000 till date. Similarly, the graph on the right hand side shows stationarity in exchange rate at log difference.

4.1.3 Descriptive statistics

Table 2: Descriptive statistics

	<u>LNFDI</u>	<u>LNEXR</u>	<u>LNGDP</u>	<u>LNINF</u>	<u>LNPDT</u>	<u>LNPOP</u>
Mean	18.38361	-7.317574	22.88284	-1.295535	-3.365270	16.64102
Median	18.48366	-6.415824	22.58173	-1.276881	-3.323621	16.65863
Maximum	21.93622	-3.292612	24.59040	0.207512	-2.228430	17.12641
Minimum	14.50866	-13.67629	21.75649	-2.193723	-4.689566	16.10109
Std. Dev.	2.301664	3.222498	0.840956	0.572935	0.726776	0.303723
Skewness	0.180111	-0.730274	0.879313	0.699481	-0.316698	-0.126111
Kurtosis	1.933336	2.275718	2.321512	2.849791	1.968166	1.873543
Observations	39	39	39	39	39	39

Source: Author's computation from World Bank Online Data Base, 2015.

The rate of FDI growth in Ghana averaged 18.38. Growth in Inflation on the other hand averaged -1.2955 over the period. This rate might be attributed to the moderate growth of GDP and FDI. Growth in Exchange rate also averaged -7.32 over the period. Over the same period under study, GDP growth also averaged 12.883 which was a good figure for a developing country.

The maximum rate of FDI growth was 21.94 while the minimum rate of growth was 14.51. Also, growth in exchange rate also had a maximum of -3.29 while the minimum growth was -13.68. Further, GDP growth recorded a maximum of 24.6 while the minimum growth was 21.8.

Skewness was 0.2 for FDI which implies FDI growth was positively skewed and there was a rise in FDI inflows in the country. Growth in Exchange rate also recorded skewness of -0.7 which implies negative skewness and that there were many years with high levels of exchange rate volatility than years with low levels of volatility. GDP growth is also positively skewed, with a skewness of 0.9 which implies high

levels of GDP. The positive and negative skewness in the variables indicates asymmetry in the time series.

The kurtosis for FDI growth, GDP growth and growth in exchange rate all had a flat shape with records 1.9, 2.3 and 2.3 respectively.

4.1.4 Test for Co-integration

One of our objectives was to examine the long run relationship between exchange rate and FDI. In order to achieve this objective, we conducted the co-integration test to find out the number of long run relationships that exist between the variables. For the co-integration test there exists the trace statistics and Max- Eigen value, each one confirms the other. We fail to accept the null hypothesis for trace statistics None* because it is significant under 5% and we accept the alternative hypothesis atmost 1 because it is not significant under 5%. Trace test indicates 1 co-integrating equation at the 0.05 level which means that there exists only one long term relationship between the variables.

Table 3: Results of test for co-integration

Series: LNFDI LNEXR LNGDP LNINF LNPDT
 Unrestricted Cointegration Rank Test (Trace)
 Lags interval (in first differences): 1 to 1

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.504826	70.53596	69.81889	0.0438
At most 1	0.466688	46.63919	47.85613	0.0648
At most 2	0.343800	25.26515	29.79707	0.1522
At most 3	0.196018	10.94129	15.49471	0.2151
At most 4	0.098436	3.523210	3.841466	0.0605

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Estimated fromEviews.

4.1.5 Test for vector error correction model estimates

The VECM further examines the long run relationship between the variables which is our first specific objective. We used it to check whether there exists a positive or negative long run relationship.

The vector error correction model is generally used to examine the long run causality and short-term dynamics and if there is a co-integration relationship among the variables. The table below shows the long run relationship between the variables.

From table 4, growth in FDI has a negative long run relationship with growth in exchange rates with a figure of -1.110067 with standard error of (0.16706) and also t-statistics of [-6.64469], the t-statistics value indicates that growth in exchange rate has a significant long run relationship with FDI growth. FDI growth also has a negative long run relationship with GDP growth at a figure of -1.888484, a standard error of (0.86823) and a t-statistics of [-2.17510], the t-statistics indicates that the long run relationship between the variables is significant. Growth in inflation has a positive long-term relationship with FDI growth at 1.034152, a standard error of (0.86823) and a t-statistic of [1.20822], so the t-statistic value shows that long term relationship between FDI growth and growth in inflation is insignificant. FDI growth also has a negative long run relationship with growth in public debt with a figure of -1.339923, a standard error of (0.65471) and a t-statistic of [-2.04658], which also explains a significant long run relationship between the two variables. However, the co-integration equation has a constant of 14.63317. The VECM tries to adjust the co-integration equation to the equilibrium due to the number of lags in the co-integration. The coefficient of the co-integration in VECM determines the speed at which the adjustment to equilibrium is done, the higher the coefficient number the faster the adjustment is.

Table 4: Result of vector error correction model estimate

Cointegrating Eq:	CointEq1
LNFDI(-1)	1.000000
LNEXR(-1)	-1.110067 (0.16706) [-6.64469]
LNGDP(-1)	-1.888484 (0.86823) [-2.17510]
LNINF(-1)	1.034152 (0.85593) [1.20822]
LNPDT(-1)	-1.339923 (0.65471) [-2.04658]
C	14.63317

Source: Estimated from Eviews

4.1.6 Multiple regression

This test fulfills two objectives which are to examine the effect of exchange rate on FDI and to find out other factors that affects FDI.

Hypothesis for multiple regressions

$$\mathbf{H}_0: b_0 = b_1 = b_2 = b_3 = b_4 = b_5 = 0$$

$$\mathbf{H}_1: b_0 = b_1 = b_2 = b_3 = b_4 = b_5 \neq 0$$

Table 5: Results of multiple regression estimate

Dependent Variable: LNFDI				
Included observations: 39				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-256.9546	69.83480	-3.679463	0.0008
LNEXR	-0.915852	0.347246	-2.637475	0.0126
LNGDP	-0.493146	0.643724	-0.766083	0.4491
LNINF	-0.259554	0.334737	-0.775396	0.4436
LNPDT	-0.259554	0.357319	-0.816488	0.4201
LNPOP	16.74193	4.652554	3.598439	0.0010
R-squared	0.867317			
Adjusted R-squared	0.847213			
F-statistic	43.14251			
Prob(F-statistic)	0.000000			

Source: Estimated from Eviews.

The multiple regression table above shows how the independent variables explain the dependent variable. From the table, a rise in exchange rate growth leads to a decrease in FDI growth by -0.915852. The p-value (0.0126) explains that growth in exchange rate is significant in determining FDI growth. Also, a rise in GDP growth leads to a decrease in FDI growth by -0.493146. The p-value (0.4491) shows that GDP growth is insignificant in determining FDI growth. Again, an increase in inflation growth leads to a decrease in FDI growth by -0.259554. The p-value (0.4436) indicates that growth in inflation is not significant in the determination of FDI growth. Further, an increase in the growth of public debt leads to a decrease in FDI growth by -0.259554. The p-value (0.4201) elucidates that growth in public debt is not significant in determining FDI. Finally, a rise in population growth leads to an increase in FDI growth by 16.74193. The p-value (0.0010) shows that population growth is a significant factor in determining FDI growth.

The R-squared value means that the 86.7% variation in FDI growth is explained by the changes in exchange rate growth, GDP growth, growth in inflation, growth in public debt and population growth. The computed F has a value of 43.14251 with a P-value of 0.000000 which is less than 0.05. We fail to accept Ho at 5% level of significance and conclude that at least one of the explanatory variables is significant.

4.1.7 Granger causality

Our final objective was to analyze the causal link between exchange rate and FDI. Granger causality has to do with predictions than with causal links in the usual sense. It explains that while the past can predict the future, the future cannot predict the past. (Antwi, 2013)

For instance, exchange rate granger causes FDI; the past values of exchange rate can be used to predict FDI more accurately than simply using the previous values of FDI.

Table 6: Results of granger causality

Sample: 1975 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNEXR does not Granger Cause LNFDI	34	4.46713	0.0204
LNFDI does not Granger Cause LNEXR		2.63686	0.0887

Source: Estimated from Eviews

This test is done to examine the granger causality between FDI and exchange rate. We have already established a co-integration relationship between FDI and exchange rate, but the main objective of this test is to examine whether exchange rate growth granger causes FDI growth or exchange rate growth does not granger cause FDI growth. The results from the test above indicates that exchange rate growth past values can be used

to predict FDI growth more accurately, hence exchange rate granger cause FDI. The results also showed that FDI growth granger cause exchange rate growth, so we fail to accept the null hypothesis and concludes that there is a bi-causal link between exchange rate growth and FDI growth. We rejected the null hypothesis because the probability values were significant. Granger causality operates under a stationary time series data similar to co-integration analysis.

4.2 Discussion

Based on our empirical studies conducted in chapter 2 and our analysis made from the data collected, we examined our findings in comparison with the works of other authors.

Zang, et. al., (2013) applied the ADF to check for unit roots and stationarity between the variables. Because all the variables were stationary they were able to co-integrate their variables to find out their long run relationships, we used the same approach. They used a VAR approach whiles we used the VECM approach in examining the long run relationship between the variables. Their OLS estimates indicated that there is a statistical significance between exchange rate and FDI, whereas our least square method on the other hand also established a significant relationship between exchange rate growth and FDI growth. The study established a simple model of two variables that is FDI and exchange rate, where as our study established a model of multiple variables that is FDI, exchange rate, population, GDP, public debt and inflation. Their regression was not significant under 5% but our regression indicated a 5% significant level.

A study Edoumieko, (2009) also revealed that exchange rate has no effect on FDI, but FDI positively affect economic growth in Nigeria whereas our study indicated that growth in exchange rate has a significant effect on FDI growth in Ghana and also has a negative effect. Similarly, to our findings, Edoumieko, (2009) also employed a Johansen co-integration and granger causality tests to analyze the relationship and causal link between the dependent and independent variables, however the author used these tests to analyze FDI and growth whereas our work used the same analysis to examine FDI, exchange rate, GDP, population, inflation and public debt.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This section elucidates the final stage of the study. It consists of conclusions, summary of our findings, recommendations or the way forward resulting from our data collection methods in the study. It also purports various reports and recommendations that give more insight into our findings and to enhance further research on this problem.

5.1 Summary of the Findings

The main objective of this research has been to examine the effect of exchange rate on FDI, all the activities in our study which includes literature review, data collection, analysis and discussions was geared towards achieving this objective. From the analysis the following results Were Released:

Effect of Exchange Rate on FDI (Multiple Regression)

The results from the regression showed that growth in exchange rate has a negative impact or effect on growth in foreign direct investment. This implies that a rise in exchange rate growth leads to a decrease in FDI growth.

Long Run Relationship between Exchange Rate and FDI (Co-Integration And VECM)

First of all, an ADF test was used on the times series variables to make them stationary. After stationarity was achieved, a co-integration analysis was run, which explained that exists only one long run relationship exists between the variables. The VECM explained that growth in exchange rate and FDI growth has a negative long run relationship.

Other factors that contributes to the determination of FDI (multiple regression)

With FDI growth as the dependent variable, other explanatory variables were used to examine whether they had any significant impact on FDI. From the regression it explained that growth in GDP, exchange rate, Inflation and public debt had a negative effect on FDI, whereas population had a positive effect. This purports that a rise in the growth of exchange rate, GDP, Inflation and public debt leads to a decrease in FDI growth and an increase in population growth leads to an increase in FDI growth. Growth in exchange rate and population had significant effect on FDI growth whereas the other explanatory variables were insignificant.

Causal Link between Exchange Rate and FDI

Our results indicated that there is a bi-causal link between exchange rate growth and FDI growth. This implies that exchange rate growth granger causes FDI growth and FDI growth in turn granger causes exchange rate growth.

5.2 Conclusion

The main objective of the study was to examine the effect of exchange rate on FDI over the period of 1975-2015. Our findings revealed that there is a significant effect between exchange rate growth and FDI growth in Ghana. The result showed a negative relationship between exchange rate growth and FDI growth.

The second objective was to test the long run relationship between exchange rates and FDI. The test revealed that there was a negative long run relationship between exchange rate growth and FDI growth. The long-term relationship between exchange rate growth and FDI growth is significant.

The third objective of the study was to find out other factors that affect FDI. It showed that growth in all these factors; GDP, inflation and public debt had a negative

significant effect on FDI, whereas population growth had a positive effect on FDI growth. In analyzing the results growth in public debt, GDP and inflation were not significant in determining FDI, whereas growth in exchange rate and population were significant.

The final objective was to analyze the causal link between exchange rate and FDI, however the results showed that there was a bi-causal link between the variables.

From our study we identified several factors that contribute to the determination of FDI. These factors were classified into traditional, non-traditional and those not belonging to either traditional or non-traditional. The traditional factors included all factors that we used as our independent variables and other factors such as administrative bottlenecks and entry restrictions. The non-traditional factors cannot be measured quantitatively. They include complementary factors of production, average years of schooling, cost factors relating to taxes, employment conditions, restrictions of foreign trade and change in trade shares. Other determinants that were not part of both traditional and non-traditional factors were post entry restrictions and technology related regulations.

For further research into this area, we recommend that a VAR approach could be used to establish a significant relationship between the variables. Also, OLS can be used in place of least squares to derive the estimates. This might result in the improvement and changes in other findings and might draw different conclusions.

5.3 Recommendations

From our study, analysis and data gathered, the following suggestions and recommendations were made:

Firstly, the government of Ghana should improve the banking, customs, immigrations and other service delivery regulatory agencies in order to attract FDI.

Secondly, foreign investors are particularly wary of frequent changes in different government policies. To the extent possible, this should be avoided. Integrated long-term policies should be formulated for all governments to follow.

Again, the necessary physical and regulatory infrastructure needs to be provided to the extent practically possible for the investors to ease doing business.

Also, accountability should be ensured through parliamentary means, budgetary process, judicial review and appointment of CHRAJ etc.

Further, government should put in place the capacity to maximize interactions with stakeholders at sub-national and local level of government.

Government should implement fiscal incentives linked to technological advancement which leads to a high-tech manufacturing sector.

Trade facilitation: imports of capital goods, export orientation and valuable trade agreements.

Improvement in the quality of human capital; heavy investment over a long period geared towards the restoration of education standards to improve Ghana's position within the competitive world.

If the government is to adhere to these policy recommendations, it will create an enabling environment for foreign investors to plant more capital into the economy.

Definition of Key Terms & Concepts

- **Foreign capital inflow:** is an external source of fund, normally used for the purchase of local asset by foreigners. They mainly occur in two forms, thus Foreign Direct Investment (FDI) and Foreign Institutional Investment or Foreign Portfolio Investment (FPI).
- **Foreign Direct Investment (FDI):** can be seen as all companies or individuals from other foreign countries who have invested in the form of acquisition or establishment of their own business or holding an equity stake in other domestic economies other than their own countries.
- **Foreign portfolio/institutional investment (FPI):** it is an investment in stocks or shares in other domestic economies other than their own countries.
- **Currency fluctuation:** is the change in the value of a currency over a period of time. It can simply be referred as the depreciation and appreciation of a domestic currency relative to other foreign currencies in the international market.
- **Currency appreciation:** is the rise in the value of a country's currency in relation to other foreign country's currency in a floating exchange rate system.
- **Currency depreciation:** is the fall in the value of a country's currency in relation to other foreign country's currency in a floating exchange rate system.
- **Exchange rate:** is the price of a country's currency in relation to the price of other foreign countries currencies.
- **Spot exchange rate:** is the amount one currency will trade for another today. In other words, it is the price a person would have to pay in one currency to buy another currency today. It is quoted and exchanged in the same day.

- **Forward exchange rate:** is the amount one currency will trade for another in a specified future date. The forward rate is quoted today but for delivery and payment on a specific future date.
- **Floating exchange rate:** is when the exchange rate of a country's currency is market determined or set by the forex market based on the demand and supply of currencies.
- **Fixed exchange rate:** is when the government or central banks predominantly determines the exchange rate of a country.
- **Protectionist Policy:** this refers to government policies that restrict international trade to help domestic industries.
- **Liberalization:** is a process of transition from strict socialist and protectionist policy regime where government leaders solely decides for the country to periods where democratic government decisions and policies on economy, politics and the society is determined by different institutions together with the government to foster economic growth and development. Examples of such policies are the Economic Recovery program (ERP) and the Structural Adjustment Program (SAP) implemented by the PNDC in Ghana in 1983.
- **Economic recovery program (ERP):** this is a policy by the I.M.F and the World Bank issued to countries that faces a recession and aimed at reversing a protracted period of serious economic decline characterized by lax financial management, inflation rates well over 100 percent and extensive government involvement in the economy. The overriding purpose of the ERP was to reduce Ghana's debt and to improve its trading position in the global economy.

- **Structural adjustment program (SAP):** is an economic policy which a country must follow in order to qualify for new world bank and international monetary fund loans and help them make debt repayments on the older debts owed to commercial banks, governments and the world bank. SAPs are created with the goal of reducing the borrowing country's fiscal imbalances in the short and medium term, or in order to adjust the economy to long term growth.
- **Foreign exchange market:** is an institution or market where currencies are converted to other currencies. The value (exchange rate) of a currency is determined in the foreign exchange market.
- **Economic development:** is defined as an improvement in the economic well-being of citizens in a country. It is mainly achieved through the increase in employment rate, income, better healthcare, education and other infrastructural activities.
- **Investor confidence:** it measures the degree of optimism that investors feel about the overall state of the economy, the investment climate, investors own personal financial situation and the portfolio of investment at hand before undertaking specific investment projects.
- **Developing country:** a nation with a low standard of living relative to other countries that is seeking to become more advanced economically and socially. Usually developing countries are characterized by little industrial activities and people generally have low incomes.
- **Economic growth:** it is an increase in a country's productive capacity, as measured by comparing gross national product (GNP) in a year with the GNP in the previous year. An increase in a country's productive potential can be

shown by an outward shift in the economy's production possibility curve (PPF).

- **Devaluation:** it is the deliberate downward adjustment in the value of a country's currency relative to another country's currency.
- **Revaluation:** it is the calculated upward adjustment of a country's official exchange rate relative to a chosen base line.
- **Stable currency:** it is a global reserve currency with high liquidity, strong demand and normally issued by a strong economy and can also be linked to gold.
- **The World Monetary and Exchange Rate Systems** History has it that there have been different exchange rate systems adopted by most countries. According to Case, Fair and Oster (2009), the three conspicuous ones are the Gold Standard (fixed exchange rate), the Bretton Woods System, and the Flexible Exchange Rate System

REFERENCES

- Adegboye, B. F., Tolulope, F. A., Ojeka, A. S., Akinjare, A. V. & Olokoyo, O. F. (2020). *Foreign direct investment, dual gap model and economic development in sub-Saharan Africa*, *Cogent Social Sciences*, 6:1, 1743138, DOI: 10.1080/23311886.2020.1743138
- Adegboye, F. B. (2014). *Foreign direct investment and economic development: Evidence from selected African countries* [Ph.D. Thesis]. Covenant University.
- Adu-Gyamfi, A. (2011). Assessing the impact of exchange rate volatility of economic growth in Ghana (Doctoral dissertation), Department of Economics, Kwame Nkrumah University of Science and Technology.
- Ahmed, M. (2013), *International Journal of Applied Economics*, Research Paper, 10(2), 77 – 103.
- Antwi, S. (2013). *Impact of foreign direct investment and economic growth in Ghana: A co-integration analysis*
- Asafu, J. (2005). *What has been the impact of FDI in Ghana?* Accra: Institute of Economic Affairs, Accra – Ghana
- Asiamah, N.P., Nkatia-Amponsah, E., & Barnor, C. (2010). *Effects of exchange rate regimes on foreign direct investment inflows in Ghana*, Research Paper, Department of Banking and Finance, Institute for Professional Studies and Department of Economics, University of Ghana.
- Asuming-Brempong, S. (1998). *Ghana: Exchange rate reforms and the real exchange rate* (No. 11015). Michigan State University, Department of Agricultural, Food, and Resource Economics.
- Bakoup, F. (2012). *Republic of Ghana country strategy paper*. Accra: African Development Bank.
- Bank of Ghana. (2012). *Annual report*. ISSN: 0855-0972, Accra.
- Bawumia, M. (2014), *restoring the value of the cedi*: central university college archives, Ghana.
- Borensztein, E. J., De Gregorio, & Lee, J. W. (1998). How does foreign direct investment affect economic growth. *Journal of International Economics*, 34 (1), 115

- Campa, J. (1993). Entry of foreign firms in the United States under exchange rate uncertainty. *The review of Economics and Statistics*, 75, 614-22
- Cassel. G. (1918). *Purchasing power parity*. U.S: Kaylan city life publishers.
- Chowdhury, P. R., & Anuradha, A. (2016). The effects of currency fluctuation on foreign direct investment, a study with respect to India. *International Journal of Advanced Scientific Research and Development*, 20(7)5-15
- Culpepper. T. M. (2013). *The Ghanaian economy recovery program*. Monterey, California: The NPS Institutional Archive.
- Cushman. D. (1985). Real exchange rate risk, expectations and the level of direct investment, *The Review of Economics and Statistics*, 67, 297-308.
- Elsharif-Suleman, A. H. (2005). *The impact of the exchange rate and its volatility on foreign direct investment in Sub-Saharan Africa*, Research Paper, Department of Economics and Finance, University of Texas-Pan American.
- Fiagbor, C. (2013). *Time series analysis on multiple macroeconomic indicators in Ghana*, Research Paper, Department of Mathematics, Kwame Nkrumah University of Science and Technology.
- Frenkel, J. A. (1980). Exchange rates, prices, and money: Lessons from the 1922s. *The American Economic Review*, 70, 242 – 255.
- Froot, K. A., & Stein, J. C. (1991). Exchange rates and foreign direct investment: An imperfect capital market approach. *The Quarterly Journal of Economics*, 106, 1191-217.
- Grandhi, N. (2004). *Introduction to research methodology*. Block 1. National Open
- Granger, C. W. J. (1983). Cointegrated variables and error correction models, Discussion Paper, 83 – 13(a), University of California, San Diego.
- Granger, C. W. J., & Newbold, P. (1973). Spurious regressions in econometrics. *Journal of Econometrics*, 2, 111 – 120.
- Granger, C. W. J., & Terasvirta, T. (1993). *Modelling non-linear economic relationships*. Oxford: Oxford University Press.
- Grossman, G. M., & Helpman, E. (1992), *Innovation and growth in the global economy*, (2nd ed.). Cambridge, Mass; and London England: MIT Press.
- Gujarati, D.N. (2004). *Basic econometrics (4th ed.)*, textbook. McGraw-Hill companies - New York.

- Harrigan, J., & Oduro, A. D. (2000). *Exchange rate policy and the balance of payments (1972 – 1996)*. Economic reforms in Ghana: The miracle and the Mirages, Pp: 153 – 184.
- Hendry, D. F. & Katarina, J. (1999). *Explaining cointegration analysis: Part I*, Research Paper, Nuffield College, Oxford, OX1 1NF and European University Institute, Florence.
- <https://connectusfund.org/17-big-advantages-and-disadvantages-of-foreign-direct-investment>
- International Monetary Fund (IMF), Washington DC, Various Issues.
- Jin. W., & Zhang. Q. (2013). Impact of changes in exchange rates on foreign direct investment. China: *Lignin Journal of Banking, Finance and Economics*, 20(9), 6-12.
- Lene.A. (2000). *Balance of payment theory*. America: American economic association.
- Loesse, J. E., (2010). Long- run relationship and causality between foreign direct investment and growth: Evidence from ten African countries. *International Journal of Economics and Finance*, 12, 2.
- MacDonald, R. (2007). *Exchange rate economics: Theories and evidence, textbook*, ISBN: 0-203-38018-5, Routledge, Taylor and Francis Group, New York – USA.
- Madura.J. (2013). *International financial management*. Florida: Cengage learning page 264.
- Mensah I. (2014) *The Ghana cedi crisis: implications and way forward*. Modern Ghana
- Mohammed, B., Mohammed, I., Amjab.A., Mohammed S., Mansoor A., Iltaf, H., & Tehreem. F., (2014), *the impact of exchange rate on Pakistan, Advances in economics and business*.
- Mustafa, K., & Nishat, M. (2004). Volatility of exchange rate and export growth in Pakistan. *The Pakistan Development Review*, 43, 813-828.
- Nunnenkamp, P. (2002), *Determinants of FDI in developing countries and how globalization has changed the rules of the game*. Kiel Institute for World Economics DuesternbrookerWeg 120 24105 Kiel (Germany)

- Osei, K. A. (1996). *Foreign exchange bureaux in the economy of Ghana*, African Economic Research Consortium, Research Paper 45.
- Owusu-Afriyie, E. & Zakari, M. (2004). *Determinants of the cedi/dollar rate of exchange in Ghana: A monetary approach*, Research Paper, Bank of Ghana Working Paper (WP/BOG-2004/06).
- Pesarn, M.H, Shin Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of Level relationships. *Journal of Applied Econometrics* 16, 289-326
- Romer, P.M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94, 1002–37
- SRI International and Service Group (1989), “Macroeconomic Assessment on Ghana’s Economic Recovery Program and its Impact on Private Sector Development: Bureau for Private Enterprise U.S Agency for International Development.
- Rutherford, D. (2002). *Routledge dictionary of economics* (2th ed.), ISBN: 0-203-00054-4, Taylor and Francis Group, London and New York.
- Sackey, H. A. (2001). External aid inflows and the real exchange rate in Ghana, *African Economic Research Consortium*, 110.
- Salvatore, D. (1995). *International economics textbook* (5th ed.), New York: Macmillan Publishing.
- Salvatore, D. (1995). *Schaum’s outline of theory and problems of international economics* (3rd ed.), Textbook, ISBN: 0-07-054538-3, Pg: 121, McGraw-Hill Incorporation, Fordham University – New York.
- Sloman, J. (2006). *Economics* (6th ed.), Textbook, ISBN: 13: 978-0-273-70512-3, Pp: 635 – 701, Pearson Education, University of the West of England and the Economics Network.
- Sorenson-Whita-Jacobson (2005). *Introducing advanced macroeconomics, textbook*, Pp: 730 – 822, McGraw-Hill Companies.
- Sowa, N. K. & Kwakye, J. K. (1991). Exchange rate policy and macroeconomic performance in Ghana. *African Economic Research Consortium*, Research Paper 6.
- Stouff, K. (2010), *A small change can equate to a big impact*. U.S.A.: National association of REALTORS.
- The World Bank. (2013). *GDP Growth*, Ghana. <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>

- Toda, H.Y. & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of Econometrics*, 66, 225-250.
- Todaro & Smith. (2012). *Economic development (11th ed.)*, Textbook, ISBN 978-0-13-801388-2 Pp: 688-734, Pearson Education, Addison Wesley.
- United Nations on Trade and Development (UNCTAD). (2005). *Impact of FDI in developing countries*. Ghana: united nations university UNU-WIDER.
- Vernon, R. (1966). International investment and international trade in the product cycle. *Quarterly Journal of Economics* 80, 190-207
- Wooldridge, J. M. (2013). *Introductory econometrics: A modern approach (5th ed.)*, Textbook, ISBN – 13: 978-1-111-53104-1, Michigan State University, SouthWestern Cengage Learning.
- World Bank Group. (2013). Ghana,” <http://www.worldbank.org/en/country/ghana>.
- Yemidi, S. (2010). *Determinants of exchange rate behaviour: An evaluation in Ghana*, Research Paper, Economics Department - University of Cape Coast.
- Yoder, J. (2007). Dynamic models (Part 6), *WSU Econometric II*, 91 – 115.

APPENDICES

APPENDIX A

Results of Unit Root Test

FDI

Null Hypothesis: D(LNFDI) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.132455	0.0002
Test critical values:		
1% level	-3.639407	
5% level	-2.951125	
10% level	-2.614300	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNFDI,2)

Method: Least Squares

Date: 05/12/17 Time: 09:54

Sample (adjusted): 1982 2015

Included observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNFDI(-1))	-0.904047	0.176143	-5.132455	0.0000
C	0.140117	0.119548	1.172054	0.2498
R-squared	0.451511	Mean dependent var		-0.002761
Adjusted R-squared	0.434371	S.D. dependent var		0.901384
S.E. of regression	0.677916	Akaike info criterion		2.117435
Sum squared resid	14.70624	Schwarz criterion		2.207221
Log likelihood	-33.99640	Hannan-Quinn criter.		2.148055
F-statistic	26.34210	Durbin-Watson stat		1.961503
Prob(F-statistic)	0.000014			

EXR

Null Hypothesis: D(LNEXR) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.821577	0.0058
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNEXR,2)

Method: Least Squares

Date: 05/12/17 Time: 09:55

Sample (adjusted): 1977 2015

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNEXR(-1))	-0.555896	0.145462	-3.821577	0.0005
C	0.150827	0.057549	2.620849	0.0127
R-squared	0.283008	Mean dependent var		0.006353
Adjusted R-squared	0.263629	S.D. dependent var		0.315771
S.E. of regression	0.270969	Akaike info criterion		0.276297
Sum squared resid	2.716700	Schwarz criterion		0.361608
Log likelihood	-3.387797	Hannan-Quinn criter.		0.306906
F-statistic	14.60445	Durbin-Watson stat		1.776781
Prob(F-statistic)	0.000491			

GDP

Null Hypothesis: D(LNGDP) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.985116	0.0002
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNGDP,2)

Method: Least Squares

Date: 05/12/17 Time: 09:56

Sample (adjusted): 1977 2015

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGDP(-1))	-0.804654	0.161411	-4.985116	0.0000
C	0.053756	0.028105	1.912677	0.0636
R-squared	0.401792	Mean dependent var		-0.000310
Adjusted R-squared	0.385624	S.D. dependent var		0.206578
S.E. of regression	0.161920	Akaike info criterion		-0.753503
Sum squared resid	0.970074	Schwarz criterion		-0.668193
Log likelihood	16.69332	Hannan-Quinn criter.		-0.722895
F-statistic	24.85138	Durbin-Watson stat		1.980248
Prob(F-statistic)	0.000015			

INF

Null Hypothesis: D(LNINF) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.797869	0.0000
Test critical values:		
1% level	-3.615588	
5% level	-2.941145	
10% level	-2.609066	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNINF,2)

Method: Least Squares

Date: 05/12/17 Time: 09:58

Sample (adjusted): 1978 2015

Included observations: 38 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINF(-1))	-1.981828	0.254150	-7.797869	0.0000
D(LNINF(-1),2)	0.387319	0.150277	2.577366	0.0143
C	-0.049603	0.087246	-0.568541	0.5733
R-squared	0.770465	Mean dependent var		-0.021304
Adjusted R-squared	0.757349	S.D. dependent var		1.090732
S.E. of regression	0.537291	Akaike info criterion		1.671103
Sum squared resid	10.10385	Schwarz criterion		1.800386
Log likelihood	-28.75095	Hannan-Quinn criter.		1.717101
F-statistic	58.74109	Durbin-Watson stat		2.133430
Prob(F-statistic)	0.000000			

PDT

Null Hypothesis: D(LNPDT) has a unit root

Exogenous: Constant

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

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-6.162447	0.0000
Test critical values:		
1% level	-3.610453	
5% level	-2.938987	
10% level	-2.607932	

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

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNPDT,2)

Method: Least Squares

Date: 05/12/17 Time: 09:59

Sample (adjusted): 1977 2015

Included observations: 39 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNPDT(-1))	-1.018180	0.165223	-6.162447	0.0000
C	0.010958	0.056859	0.192721	0.8482
R-squared	0.506507	Mean dependent var		0.008840
Adjusted R-squared	0.493169	S.D. dependent var		0.498757
S.E. of regression	0.355075	Akaike info criterion		0.816947
Sum squared resid	4.664904	Schwarz criterion		0.902258
Log likelihood	-13.93046	Hannan-Quinn criter.		0.847556
F-statistic	37.97575	Durbin-Watson stat		1.958660
Prob(F-statistic)	0.000000			

APPENDIX B

Results of Co-integration

Date: 05/12/17 Time: 10:01

Sample (adjusted): 1982 2015

Included observations: 34 after adjustments

Trend assumption: Linear deterministic trend

Series: LNFDI LNXR LNGDP LNINF LNPDT

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.504826	70.53596	69.81889	0.0438
At most 1	0.466688	46.63919	47.85613	0.0648
At most 2	0.343800	25.26515	29.79707	0.1522
At most 3	0.196018	10.94129	15.49471	0.2151
At most 4	0.098436	3.523210	3.841466	0.0605

Trace test indicates 1 cointegratingeqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.504826	23.89677	33.87687	0.4631
At most 1	0.466688	21.37404	27.58434	0.2543
At most 2	0.343800	14.32386	21.13162	0.3390
At most 3	0.196018	7.418078	14.26460	0.4409
At most 4	0.098436	3.523210	3.841466	0.0605

Max-eigenvalue test indicates no cointegration at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by $b'S_{11}b=I$):

LNFDI	LNEXR	LNGDP	LNINF	LNPDT
0.098702	0.044441	0.486468	3.356208	-0.138015
-0.754034	0.963397	0.231501	2.087412	-0.689263
-0.722436	0.559495	-2.013422	-0.189686	-3.205207
1.239234	-0.053723	-3.885345	-0.516941	-0.799487
0.300964	-0.251659	0.940345	-0.481638	-0.109669

Unrestricted Adjustment Coefficients (alpha):

D(LNFDI)	-0.215806	0.178194	0.038073	-0.189717
D(LNEXR)	0.007832	-0.174667	0.016758	0.008086
D(LNGDP)	-0.001328	0.062104	0.067321	0.022060
D(LNINF)	-0.276722	-0.114954	0.133300	0.070573
D(LNPDT)	0.002189	-0.085652	0.021261	-0.046176

1 Cointegrating Equation(s): Log likelihood -22.31299

Normalized cointegrating coefficients (standard error in parentheses)

LNFDI				
1.000000	LNEXR	LNGDP	LNINF	LNPDT
	0.450258	4.928649	34.00338	-1.398302
	(1.63759)	(7.85821)	(7.44022)	(6.17737)

Adjustment coefficients (standard error in parentheses)

D(LNFDI)	-0.021301
	(0.01090)
D(LNEXR)	0.000773
	(0.00492)
D(LNGDP)	-0.000131

	(0.00314)
D(LNINF)	-0.027313
	(0.00808)
D(LNPDT)	0.000216
	(0.00625)

2 Cointegrating Equation(s): Log likelihood -11.62597

Normalized cointegrating coefficients (standard error in parentheses)

LNFDI	LNEXR	LNGDP	LNINF	LNPDT
1.000000	0.000000	3.564346	24.42145	-0.795739
		(4.17967)	(5.03645)	(3.74575)
0.000000	1.000000	3.030049	21.28097	-1.338262
		(3.29976)	(3.97617)	(2.95718)

Adjustment coefficients (standard error in parentheses)

D(LNFDI)	-0.155665	0.162081
	(0.07979)	(0.10119)
D(LNEXR)	0.132478	-0.167926
	(0.02803)	(0.03554)
D(LNGDP)	-0.046960	0.059772
	(0.02239)	(0.02839)
D(LNINF)	0.059366	-0.123045
	(0.05994)	(0.07602)
D(LNPDT)	0.064800	-0.082419
	(0.04649)	(0.05896)

3 Cointegrating Equation(s): Log likelihood -4.464040

Normalized cointegrating coefficients (standard error in parentheses)

LNFDI	LNEXR	LNGDP	LNINF	LNPDT
1.000000	0.000000	0.000000	41.85997	-10.32614
			(8.05779)	(4.49704)
0.000000	1.000000	0.000000	36.10544	-9.440056
			(6.51223)	(3.63446)
0.000000	0.000000	1.000000	-4.892487	2.673817
			(1.24816)	(0.69660)

Adjustment coefficients (standard error in parentheses)

D(LNFDI)	-0.183170	0.183382	-0.140387
	(0.10979)	(0.11670)	(0.21816)
D(LNEXR)	0.120372	-0.158550	-0.070366
	(0.03851)	(0.04093)	(0.07652)
D(LNGDP)	-0.095595	0.097438	-0.121814
	(0.02773)	(0.02947)	(0.05509)
D(LNINF)	-0.036935	-0.048464	-0.429618
	(0.07817)	(0.08310)	(0.15534)
D(LNPDT)	0.049441	-0.070524	-0.061570
	(0.06399)	(0.06802)	(0.12714)

4 Cointegrating Equation(s): Log likelihood -0.755001

Normalized cointegrating coefficients (standard error in parentheses)

LNFDI	LNEXR	LNGDP	LNINF	LNPDT
1.000000	0.000000	0.000000	0.000000	2.858843 (0.64460)
0.000000	1.000000	0.000000	0.000000	1.932380 (0.80572)
0.000000	0.000000	1.000000	0.000000	1.132789 (0.17722)
0.000000	0.000000	0.000000	1.000000	-0.314978 (0.11113)

Adjustment coefficients (standard error in parentheses)

D(LNFDI)	-0.418274 (0.15926)	0.193575 (0.10950)	0.596730 (0.43250)	-0.261475 (0.39145)
D(LNEXR)	0.130393 (0.05955)	-0.158984 (0.04095)	-0.101784 (0.16173)	-0.345675 (0.14638)
D(LNGDP)	-0.068257 (0.04236)	0.096253 (0.02912)	-0.207526 (0.11503)	0.101007 (0.10412)
D(LNINF)	0.050522 (0.11897)	-0.052255 (0.08180)	-0.703818 (0.32310)	-1.230460 (0.29243)
D(LNPDT)	-0.007782 (0.09798)	-0.068044 (0.06737)	0.117841 (0.26610)	-0.151607 (0.24084)

APPENDIX C

Results of Vector Error Correction Model

Vector Error Correction Estimates

Date: 05/12/17 Time: 10:02

Sample (adjusted): 1983 2015

Included observations: 33 after adjustments

Standard errors in () & t-statistics in []

CointegratingEq:	CointEq1
LNFDI(-1)	1.000000
LNEXR(-1)	-1.110067
	(0.16706)
	[-6.64469]
LNGDP(-1)	-1.888484
	(0.86823)
	[-2.17510]
LNINF(-1)	1.034152
	(0.85593)
	[1.20822]
LNPDT(-1)	-1.339923
	(0.65471)
	[-2.04658]
C	14.63317

Error Correction:	D(LNFDI)	D(LNEXR)	D(LNGDP)	D(LNINF)	D(LNPDT)
CointEq1	-0.219105 (0.06530) [-3.35554]	0.112902 (0.01957) [5.77016]	-0.008091 (0.02015) [-0.40154]	0.031215 (0.05767) [0.54127]	0.065758 (0.04041) [1.62719]
D(LNFDI(-1))	0.154796 (0.20873) [0.74160]	-0.098573 (0.06255) [-1.57595]	-0.066795 (0.06441) [-1.03702]	-0.006024 (0.18435) [-0.03268]	-0.116574 (0.12918) [-0.90239]
D(LNFDI(-2))	0.021726 (0.19489) [0.11148]	-0.013436 (0.05840) [-0.23007]	-0.023707 (0.06014) [-0.39421]	0.106163 (0.17212) [0.61679]	-0.015620 (0.12061) [-0.12950]
D(LNEXR(-1))	1.513750 (0.71484) [2.11760]	0.120189 (0.21421) [0.56109]	-0.181507 (0.22059) [-0.82284]	-0.817396 (0.63134) [-1.29470]	-0.292130 (0.44241) [-0.66031]
D(LNEXR(-2))	-0.334824 (0.57902) [-0.57826]	-0.189329 (0.17351) [-1.09119]	0.240277 (0.17867) [1.34478]	0.141266 (0.51138) [0.27624]	0.230264 (0.35835) [0.64256]
D(LNGDP(-1))	1.979147 (0.94994) [2.08344]	-0.060138 (0.28466) [-0.21127]	-0.072952 (0.29313) [-0.24887]	-1.495587 (0.83898) [-1.78263]	-0.297508 (0.58792) [-0.50604]

D(LNGDP(-2))	-0.356588	0.019539	0.122373	-0.639559	1.168722
	(1.08771)	(0.32594)	(0.33564)	(0.96065)	(0.67318)
	[-0.32783]	[0.05995]	[0.36459]	[-0.66575]	[1.73612]
D(LNINF(-1))	-0.313183	-0.061642	0.085909	-0.432386	-0.030720
	(0.27966)	(0.08380)	(0.08630)	(0.24700)	(0.17308)
	[-1.11986]	[-0.73556]	[0.99550]	[-1.75058]	[-0.17749]
D(LNINF(-2))	-0.208755	-0.114675	0.026940	-0.189640	-0.025662
	(0.19919)	(0.05969)	(0.06147)	(0.17592)	(0.12328)
	[-1.04803]	[-1.92124]	[0.43830]	[-1.07798]	[-0.20816]
D(LNPDT(-1))	-0.148377	0.100342	-0.098662	0.045064	-0.042379
	(0.38575)	(0.11559)	(0.11903)	(0.34069)	(0.23874)
	[-0.38465]	[0.86807]	[-0.82886]	[0.13227]	[-0.17751]
D(LNPDT(-2))	-0.288710	0.105399	-0.207418	-0.397330	0.363252
	(0.37797)	(0.11326)	(0.11663)	(0.33382)	(0.23392)
	[-0.76385]	[0.93058]	[-1.77838]	[-1.19026]	[1.55286]
C	-0.337983	0.321462	0.065688	0.275540	-0.018177
	(0.23089)	(0.06919)	(0.07125)	(0.20392)	(0.14290)
	[-1.46383]	[4.64625]	[0.92196]	[1.35122]	[-0.12720]

R-squared	0.482200	0.773646	0.246176	0.548514	0.256063
Adj. R-squared	0.210972	0.655080	-0.148684	0.312021	-0.133618
Sum sq. resids	7.673005	0.688992	0.730635	5.985159	2.939032
S.E. equation	0.604468	0.181133	0.186527	0.533861	0.374104
F-statistic	1.777838	6.525011	0.623451	2.319369	0.657110
Log likelihood	-22.75478	17.01409	16.04578	-18.65576	-6.920923
Akaike AIC	2.106351	-0.303884	-0.245199	1.857925	1.146723
Schwarz SC	2.650535	0.240301	0.298986	2.402110	1.690907
Mean dependent	0.159919	0.288237	0.067583	-0.013608	0.001475
S.D. dependent	0.680498	0.308417	0.174036	0.643637	0.351366

Determinant reside covariance (dof adj.)	3.24E-06
Determinant reside covariance	3.38E-07
Log likelihood	11.71786
Akaike information criterion	3.229221
Schwarz criterion	6.176887

APPENDIX D

Results of Granger Causality

Pairwise Granger Causality Tests

Date: 05/12/17 Time: 10:03

Sample: 1975 2015

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNEXR does not Granger Cause LNFDI	34	4.46713	0.0204
LNFDI does not Granger Cause LNEXR		2.63686	0.0887
LNGDP does not Granger Cause LNFDI	34	2.89156	0.0716
LNFDI does not Granger Cause LNGDP		0.26614	0.7682
LNINF does not Granger Cause LNFDI	34	1.01920	0.3734
LNFDI does not Granger Cause LNINF		2.46520	0.1026
LNPDT does not Granger Cause LNFDI	34	0.38411	0.6845
LNFDI does not Granger Cause LNPDT		0.55425	0.5805
LNGDP does not Granger Cause LNEXR			
LNEXR	39	0.26345	0.7699
LNEXR does not Granger Cause LNGDP		0.73084	0.4889
LNINF does not Granger Cause LNEXR	39	0.75511	0.4777
LNEXR does not Granger Cause LNINF		11.4085	0.0002
LNPDT does not Granger Cause LNEXR	39	0.06334	0.9387

LNEXR

LNEXR does not Granger Cause LNPDT		0.90516	0.4140
<hr/>			
LNINF does not Granger Cause LNGDP	39	0.10653	0.8992
LNGDP does not Granger Cause LNINF		5.82717	0.0067
<hr/>			
LNPDT does not Granger Cause			
LNGDP	39	0.56766	0.5721
LNGDP does not Granger Cause LNPDT		0.40716	0.6687
<hr/>			
LNPDT does not Granger Cause LNINF	39	0.38486	0.6835
LNINF does not Granger Cause LNPDT		0.82818	0.4455
<hr/>			

APPENDIX E

Results of Multiple Regression

Dependent Variable: LNFDI

Method: Least Squares

Date: 05/12/17 Time: 10:05

Sample: 1975 2015

Included observations: 39

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-256.9546	69.83480	-3.679463	0.0008
LNEXR	-0.915852	0.347246	-2.637475	0.0126
LNGDP	-0.493146	0.643724	-0.766083	0.4491
LNINF	-0.259554	0.334737	-0.775396	0.4436
LNPDT	-0.291746	0.357319	-0.816488	0.4201
LNPOP	16.74193	4.652554	3.598439	0.0010
R-squared	0.867317	Mean dependent var	18.38361	
Adjusted R-squared	0.847213	S.D. dependent var	2.301664	
S.E. of regression	0.899673	Akaike info criterion	2.767068	
Sum squared resid	26.71059	Schwarz criterion	3.023000	
Log likelihood	-47.95782	Hannan-Quinn criter.	2.858894	
F-statistic	43.14251	Durbin-Watson stat	0.571615	
Prob(F-statistic)	0.000000			

APPENDIX F

Descriptive Statistics

	LNFDI	LNEXR	LNGDP	LNINF	LNPDT	LNPOP
Mean	18.38361	-7.317574	22.88284	-1.295535	-3.365270	16.64102
Median	18.48366	-6.415824	22.58173	-1.276881	-3.323621	16.65863
Maximum	21.93622	-3.292612	24.59040	0.207512	-2.228430	17.12641
Minimum	14.50866	-13.67629	21.75649	-2.193723	-4.689566	16.10109
Std. Dev.	2.301664	3.222498	0.840956	0.572935	0.726776	0.303723
Skewness	0.180111	-0.730274	0.879313	0.699481	-0.316698	-0.126111
Kurtosis	1.933336	2.275718	2.321512	2.849791	1.968166	1.873543
Jarque-Bera	2.059738	4.318902	5.773811	3.216945	2.382044	2.165348
Probability	0.357054	0.115388	0.055748	0.200193	0.303911	0.338689
Sum	716.9610	-285.3854	892.4308	-50.52586	-131.2455	648.9999
Sum Sq. Dev.	201.3109	394.6108	26.87389	12.47368	20.07170	3.505415
Observations	39	39	39	39	39	39

APPENDIX G

Raw Data

Year	FDI	POP	GDP	INF	EXR	PDT
1975	70869955	9831409	2810106390	0.294635237	1.14938E-06	0.02083173
1976	-18260970	10023471	2765254360	0.280486497	1.14938E-06	0.01891898
1977	19217479.38	10189889	3189428571	0.672507824	1.14938E-06	0.01192794
1978	9696236.565	10354490	3662478173	0.733066946	1.76263E-06	0.02023617
1979	-2800000	10550770	4020227931	0.379494782	2.74852E-06	0.02585715
1980	15600000	10802025	4445228057	0.51126135	2.74852E-06	0.0359321
1981	16263752	11117608	4222441673	0.756335658	2.74852E-06	0.02816012
1982	16300000	11488112	4035994383	0.278905791	2.74852E-06	0.02758745
1983	2400000	11895130	4057275078	1.230612136	8.82523E-06	0.03612029
1984	2000000	12311166	4412279865	0.353124243	3.59668E-05	0.03044268
1985	5600000	12716238	4504342153	0.20648415	5.43358E-05	0.03602217
1986	4300000	13103975	5727602649	0.417057955	8.91562E-05	0.04069232
1987	4700000	13480381	5074829932	0.392014969	0.000153651	0.08406624
1988	5000000	13852597	5197840973	0.334028542	0.000202237	0.1076974
1989	15000000	14232493	5251764270	0.282943111	0.000269855	0.08841016
1990	14800000	14628260	5889174834	0.311665867	0.000326156	0.06371195
1991	20000000	15042736	6596546196	0.200413594	0.000367633	0.04655333
1992	22500000	15471527	6413901602	0.111500827	0.000436852	0.05058006
1993	125000000	15907244	5966255778	0.317572124	0.000648712	0.05264826
1994	233000000	16339344	5444560669	0.301289272	0.000955682	0.06916783
1995	106500000	16760991	6465137615	0.430453305	0.001199139	0.06409751

1996	120000000	17169214	6934984709	0.39837743	0.001635472	0.07105338
1997	81800000	17568583	6891308594	0.194581674	0.002047963	0.08272797
1998	167400000	17969006	7480968858	0.170484653	0.002311659	0.07945202
1999	243700000	18384426	7719354839	0.13971165	0.00266643	0.06964044
2000	165900000	18824994	4983024408	0.272301138	0.005449192	0.09668902
2001	89320000	19293804	5314909954	0.348179442	0.007163052	0.05997606
2002	58930000	19788181	6166330136	0.228185846	0.007924171	0.03679014
2003	136751000	20305396	7632406553	0.287044074	0.008667643	0.06725135
2004	139270000	20840493	8881368538	0.143501511	0.008994949	0.0319294
2005	144970000	21389514	10731634117	0.149637183	0.00906279	0.03211992
2006	636010000	21951891	20409257610	0.807509418	0.009164518	0.01424918
2007	1383177930	22528041	24758819718	0.186302769	0.009352478	0.00954005
2008	2714916344	23115919	28526891010	0.194102709	0.010578583	0.01037656
2009	2372540000	23713164	25977847814	0.156651686	0.014088	0.01122164
2010	2527350000	24317734	32174772956	0.165956141	0.01431025	0.01197418
2011	3247588000	24928503	39566292433	0.139159418	0.0151185	0.00919067
2012	3294520000	25544565	41939728979	0.152055713	0.017958167	0.01346554
2013	3227000000	26164432	47805069495	0.155810773	0.0195405	0.02150659
2014	3363389444	26786598	38616536132	0.166812754	0.029002833	0.02259229
2015	3192320531	27409893	37543361204	0.178002242	0.037156667	0.02896378
