DECLARATION

I hereby declare that this submission is my own work towards the MPhil Degree in Economics and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgement has been made in the text.

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DEDICATION

With great joy, this work is dedicated to the Almighty God for his steadfast love and mercies that never ceases. Also dedicated to my parents Mr. and Mrs.Amoah, selfless brother Michael Amoah, and wonderful sister Portia Amoah without whose encouragement and support I would not have come this far. To all Executives, leaders and members of Campus Christian Family (CCF-KNUST) this piece is also dedicated to you.

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ABSTRACT

In spite of the several policies being implemented by the government of Ghana to enhance the flow of FDI into the economy, available data indicates that the level of FDI inflows has also been falling. This is worrying for a nation like Ghana which depends so much on FDI for growth and development. In the same vein, the exchange rate of the Cedi to major trading currencies has also been increasing. This is a key factor which most foreign investors before embarking on an investment in a nation, take into consideration. This call for this study which seeks to analyse the effect that exchange rate has on foreign direct investment in Ghana using annual time series data covering the period 1980 to 2013. The study employs the ARDL technique to empirically ascertain the long run and short run relationship between the variables. The study finds that exchange rate has a negative effect on foreign direct investment inflows in Ghana both in the long run and short run. However, the negative effect of exchange rate on FDI is only statistically significant in the short run. This shows that a depreciation of the Ghanaian cedi brings about a decrease in the FDI inflows into the economy. Therefore, to ensure high FDI inflows into the economy, there is the need for the central Bank of Ghana to embark on a contractionary monetary policy in order to reduce money supply in the economy. The decrease in money supply would bring about an increase in interest rate and hence make domestic interest bearing assets more lucrative. This will cause both local and foreign investors to demand these interest bearing assets which in turn brings about an increase in the demand for the cedi. The resultant effect would be an appreciation of the Cedi and hence an increase in FDI inflows.

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LIST OF ABBREVIATIONS

ADF Augmented Dickey-Fuller

ARCH Autoregressive Conditional Heteroscedastic

ARDL Autoregressive Distributed Lag

ECM	Error Correction Model
ERV	Exchange Rate Volatility
ERP	Economic Recovery Programme
EXR	Exchange Rate
FDI	Foreign Direct Investment
GARCH	Generalised Autoregressive Conditional Heteroscedastic
GDP	Gross Domestic Product
GIPC	Ghana Investment Promotion Council
IFS	International Financial Statistics
IMF	International Monetary Fund
INT	Interest Rate
IOH	Industrial Organization Theory Hypothesis
MDG	Millennium Development Goals
MNC	Multinational Corporation
NEEX	Nominal Effective Exchange Rate
OLS	Ordinary Least Squares
PP	Phillip-Perron
SAP	Structural Adjustment Programme
TO	Trade Openness
UECM	Unrestricted Error Correction Model
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
VAR	Vector Autoregressive

VECM Vector Error Correction Model

WDI World Development Indicators

CHAPTER ONE INTRODUCTION

1.1 Background of the Study

Foreign direct investment (FDI) simply refers to a foreign investor establishing a production facility in a country other than that of his country. It involves the net inflows of investment to acquire a lasting management interest normally 10% of voting stock in an enterprise operating in an economy other than that of the investor, defined according to residency. Investments of this form may be a merger or acquisition which involves existing interest rather than new investment (World Bank, 2008). As shown in the balance of payments, the summation of equity capital, as well as other long-term capital and short term capital is known as FDI.

For some time now, discussions on the role of foreign resource inflows, including foreign direct investment (FDI) and their possible contributions to accelerating growth and progress with respect to reaching development goals in Africa has taken centre stage (UNECA, 2010). FDI being one example of international factor movements is believed to be more beneficial to a nation than investments in the equities of its corporations. FDI can be categorised into two main types: inward foreign direct investment and outward foreign direct investment, the difference between this two types of FDI results in a net FDI inflow (positive or negative).
However, direct investment does not involve investment through purchase of shares.

In most developing countries, for that matter Ghana, because of scarcity of capital for investment, the economic conditions of these nations have been affected. With the purpose of improving this condition, various governments of developing countries have now showed much

interest and focus on investment, particularly FDI, which may not just guarantee employment but will positively influence economic growth and development. The essence for this is to minimize the disparity between domestic savings and desired gross domestic investment (Omankhanlen, 2011).

Jenkin and Thomas (2002) hypothesize FDI is relied on in order to add to the financial development by not exclusively supplying external capital but rather crowding in extra local investment. According to their study, FDI promotes both forward and backward association with the domestic economy, and hence by implication, creates additional employment with further economic activity also being stimulated. In many economies of the world, foreign direct investment has undoubtedly played a major role with a wide range belief among policymakers that foreign direct investment (FDI) enhances the productivity of host countries as well as development.

FDI brings with it the transfer of not only financial capital, but also technology and other skills (managerial, marketing, and accounting,) as well as the capability of improving the efficiency of domestic resources by transferring them from less productive to more productive sectors of the economy. While some studies identify a positive correlation between FDI and income growth (Alfaro et al., 2004; Carkovic and Levine, 2005; Hansen and Rand, 2006), other studies identify no such relationship (Herzer et al., 2008; and Anowar and Mohammad, 2011).

Again, scores of studies on the significance of inward FDI conclude that, inflow of foreign capital greatly increases the flow of reserves for investment thus enhancing capital formation in the host country. Inflows of FDI have the potential of stimulating local investment by

causing an increase in domestic investment. This can be done through linkages in the production chain as foreign companies purchase locally produced inputs from local companies. In addition, inward FDI can augment a nation‟s earnings in foreign exchange, supply individuals with job opportunities and also serve as a source for both human and physical capital accretion.

It is obvious that FDIs in the country rather give higher remunerations than job opportunities created by local investors. Harrison (1996) discovers that the wage differences between foreign owned companies and locally owned companies in Ghana‟s neighbouring country, Cote D‟Ivoire range from 10% to about 90%; this would not be different from Ghana‟s case. Multinational investment is therefore very critical in the Ghanaian economy in our pursuit to alleviate poverty in the nation and attain a middle income by 2020.

Given the over ridding importance of an enabling environment for investments to blossom, it is vital to explore the fundamental conditions that encourage FDI inflows. These conditions can be classified into economic, political, social and lawful factors. The constituents of the economic factors include good financial policies, fiscal policies, commerce and exchange rate strategies as well as infrastructural facilities. Furthermore, the extent of openness of the domestic economy, tariff policy, and credit delivery by a nation‟s banking system; the economy's development possibilities, market size and macroeconomic stability are all contributing elements. In addition to this, factors such as an increased benefit from investment, low labour and production cost, political stability, enduring investment atmosphere, functional infrastructure facilities and favourable regulatory environment also help to attract and keep FDI in the host nation (Coleman and Tetteh, 2008).

However, one factor foreign direct investors considers before engaging in investment is the exchange rate level of the country. Theories about FDI-exchange rate linkages emerged in the 1970s and 1980s (for example Kohlhagen 1977; Cushman 1895). Two theories that have been highly influential are Blonigen (1997) and Froot and Stein (1991). Froot and Stein used an imperfect capital markets approach to argue that exchange rates operate on wealth to affect FDI. Because of the assumption of imperfect capital markets, external sources for borrowing are more expensive than a firm‟s internal cost of capital. As a result, host currency depreciation is predicted to have a positive effect on inbound FDI, as it automatically increases the wealth of foreigners, allowing them to make higher bids for assets. This view was however in contrast to an earlier existing believe that the exchange rate would not alter the decision by a firm to invest in a foreign country. Blonigen (1997) focuses on acquisitions FDI: a special case for exchange rate effects as the acquisition of a foreign target firm can provide firm specific assets. This theory assumes goods market segmentation, and postulate that foreign and domestic firms have the same opportunity to buy, but different opportunities to generate returns on assets in foreign markets. The profitability of all branches of a multinational firm may be increased after the acquisition of a foreign firm. For this reason the level and movements of a currency may affect the relative affect valuations, and a depreciation of the host‟s currency increases FDI inflows.

Nevertheless, beyond these models are two other theories; the real options and risk aversion which provide different predictions for the response of FDI to exchange rate levels. The real option approach is based on the work of Dixit and Pindyck (1994) who considered the effects of exchange rate levels and uncertainty on investment when decisions are irreversible. According to the theory, a firm may have an option to invest overseas, with exchange rate

uncertainty potentially influencing the expected return on the option. Exchange rate uncertainty may increase the value of holding onto the option by not investing, whereas changes in exchange rate levels affect the price of the option. Example can be found in Campa (1993), Darby et al. (1999) and Kogut and Chang (1996). A different definition of option value is used in Aizenman (1992) and Sung and Lapan (2000). This is referred to as the „Production flexibility" approach in Goldberg and Kolstad (1995). Here, having plants in different countries creates the option to shift production among facilities in response to exchange rate. Aizenman (1992) allows for exchange rate endogeneity, and shows that a fixed exchange rate regime is more conducive to FDI. Kogut and Kulatilaka (1994) provide another variant of a real options model that predicts exchange rate movement increases FDI. The strength of this approach is that it highlights the effect that exchange rate movements may have on the timing of FDI, because a firm"s decisions are to invest, wait, or to not invest, whereas under the risk aversion approach firms either invests or they do not.

With the Risk aversion approach, exchange rate risk arises due to the timing differences between investment and profits. Firms invest abroad when the expected returns equal the cost plus payment for the degree of risk introduced by exchange rate. The most frequently cited models are those of Kohlhagen (1997), Itagaki (1981), Cushman (1985) and Goldberg and Kolstad (1995). Cushman (1995) argues that a risk adjusted expected real exchange rate appreciation lowers the foreign cost of capital, encouraging FDI. This positive effect may be offset by effects on inputs costs, or changes in output prices, making the exchange rate-FDI link indeterminate.

Given these theories however, the flow of FDI has been increasing drastically around the world with no exception to Ghana since the 1970s. For instance, in 2012 Ghana accrued $ 4.9bn from FDI inflows alone though this dropped to $ 3.95bn in 2013. Despite the drastic increase, available data on the level of FDI inflow in Ghana shows the tendency of it fluctuating abruptly over time - a phenomenon that cannot be explained satisfactorily by traditional theories. For instance, from the period 1995-2000 the levels of FDI are $106.5, $102, $81.8, $167.4, $243.7, and $114.7 million respectively (UNCTAD, 2012).

Blonigen (1997) posits that while conventional theories may explain the increase in FDI levels in the long run they suggest little explanation for its substantial short-run movements. With this evidence, there is a strong competition especially among developing countries to attract FDI. The reason is that there is robust empirical proof that FDI inflows are less volatile than other capital inflows (IMF, World Economic Outlook; 2007), and there is also a well-known impression that FDI is by one means or another better to spearhead the development and growth agenda of most developing economies than other capital flows.

In this vein, several policies have been implemented by various governments especially the government of Ghana to provide a conducive environment in order to attract FDI. Some of these policies include the Economic Recovery Programme (ERP) in 1983, the adoption of Mining Code in 1986, Investment Code in 1994, the establishment of the Ghana Investment Promotion Centre (1994) and the Free Zone Act in 1995. Added to these is the effort being put in place by government officials and policy makers to provide a stable macroeconomic stability which is a necessary condition in the attraction of FDI. However, one factor which has readily

not been considered as a potential barrier to FDI inflow is the exchange rate policies of the country.

In the advent of the collapse of the Bretton Woods system in 1973, the exchange rate of various nations has been fluctuating significantly over time. In the case of Ghana it has been increasing with respect to major trading currencies like the U.S dollar, British pound and the Euro. For instance, from 2009 to 2012, the exchange rates figures of the Cedi to the US dollars were 1.40, 1.43, 1.51 and 1.79 respectively (World Development Indicators, 2014). Currently, the exchange rate of the Cedi to the U.S dollar is 3.98. A generally held claim in international business community is that among the many reasons that a firm considers in its FDI decision, exchange rates are one of the most important ones. This is simply because; a depreciation of a nation"s currency can give foreigners an upper hand in buying the countries asset. This assertion is supported by one of the theories underpinning FDI, the currency area theory, which states that countries with a stronger currency (appreciating currency) tend to invest in countries with a weak currency (depreciating currency). Scores of studies have been done in the field of exchange rate movements and FDI, despite the inadequacy of traditional theories yet there is still no agreement either in theory or empirical studies (CHEN, K.M., et al., 2006).

Even though, policy makers believe that FDI is the single largest source of capital inflows for a developing country like Ghana, amazingly the effect that exchange rate has on foreign direct investment hardly ever enters discussions over exchange rate management or monetary policy. A major justification for this omission could be the paucity of conclusive evidence concerning the effect of exchange rate on investment behaviour of international firms. Various studies provide evidence that transnational firms are likely to consider the level of exchange

rates before investing in overseas branches, but all these studies have yielded conflicting theoretical prediction and empirical results. For instance Coleman Tettey (2008) found out that, exchange rate has a negative on inward FDI while Omankhanlen (2011) identified that exchange rate has a positive effect on FDI. Contrary to both studies, Nyarko and Amponsah (2011) found out that exchange rate regime has no visible effect on inward FDI. In addition to this, these studies did not also consider the short and long run effect of the level of exchange rate on FDI inflows. This is needful to help policy makers identify the kind of policy tool to employ to tackle a particular situation since some policies are only effective in the short term and not the long term.

1.2 Statement of problem

In the event of inadequate funds to finance long-term developments in Africa and with poverty alleviation and other millennium development goals (MDGs) looking increasingly complex to achieve, the issue of attracting foreign direct investment (FDI) has attained a high-flying place in the strategies for improving economic activities being advocated by policy makers at the international, regional and national levels (UNCTAD, 2010).

FDI without doubt serves as the single and largest source of capital inflows for Ghana (Emmanuel and Luther, 2014). The benefits the country derives are overwhelming. For instance, it brings with it the transfer of technology, managerial and marketing expertise, expansion of a county‟s industrial base, improvement of balance of payment, capital inflows as well as employment generation. All these factors have been argued to be significant contribution of FDI to facilitate growth and development (see for instance: Jenkin and Thomas, 2002; Lipsey et al., 2010; Mastromarco and Ghosh, 2009).

The positive spill over effects of FDI has been one of the reasons why countries, especially developing countries, strive to attract high inflows of FDI. Currently in Ghana, available data indicates that FDI inflows have been falling. For instance, FDI inflows were about 55.59% between the periods 2005 and 2006 but dropped to 29.91% in 2008. Again, the country witnessed a fall in FDI inflows from 21.56% between 2010 and 2011 to 2.16% in 2012. Lastly, the country witnessed yet another fall in the subsequent year (2013) from the previous rate of 2.16% to -2.07% (UNCTAD, 2014). This situation is worrying for a country like Ghana which depends so much on external capital inflows especially FDI. In addition to this, the current trend in FDI will stifle the economic growth and development agenda as well as stifle the rippling effects that FDI generates for the country. The above situation has raised questions regarding the factors that are contributing to this change in FDI inflows.

Several studies have shown that, FDI inflow is mostly determined by macroeconomic variables such as GDP, exchange rate, inflation, interest rate, money supply, trade openness, among others (Khan and Mitra, 2014; Saleem et. al, 2013; Onuoreh and Chi-chi, 2013; Enu et.al, 2013; Tsikata et, 2001). Scores of studies have also attributed the changes in the behaviour of FDI to the level of financial sector development and institutional quality (Hermes and Lensink, 2003; Shahbaz and Rahman, 2010). However, little consideration has been directed to the impact of only the level of exchange rate on FDI. In Ghana, the exchange rate of Ghana‟s cedi to major trading currencies, like the US dollar, is also increasing at the same time. For instance, from 2009-2013, the figures were 1.40, 1.43, 1.51, 1.79 and 2.35 respectively. Some studies suggest strong linkage between the level of exchange rate and FDI (Froot and Stein, 1991; Ellahi, 2011 and Ullah et al., 2012). In furtherance of this, a cursory look at the levels of FDI indicated that,

periods of high levels of inflows show periods where the exchange rate were relatively stable while periods of low FDI inflows shows periods where the exchange rate was increasing or relatively high.

Nevertheless, the question is, whether the depreciating exchange rate levels have an effect on FDI inflows in Ghana. It appears that, this hidden phenomenon cannot be unravelled by mere observation but the need to empirically ascertain the effects that rate of exchange has on the inflows of FDI in Ghana. In addition to this, similar studies on the effect of exchange rate on FDI which were than in Ghana such as, Nyarko and Amponsah (2011) and Adu et al. (2014) did not also consider the short and long run effect of the level of exchange rate on FDI inflows which would be empirically done in this study. This is needful to help policy makers identify the kind of policy tool to employ to tackle a particular situation since some policies are only effective in the short term and not the long term.

1.3 Objective of the study

The main objective of this research is to find out the effect of the level of exchange rate on foreign direct investment (FDI) in Ghana. To realize this, the following specific objectives were set:

1. To examine the trends in FDI and Exchange rate in Ghana from 1980 to 2013.
2. To determine the short-run effect of Exchange rate on FDI in Ghana.
3. To determine the long-run effect of Exchange rate on FDI in Ghana.
4. To determine how changes in Exchange rate affect FDI.

1.4 Hypothesis

To facilitate arrival at sound findings in order to achieve the objectives set out for the study, the following a priori research hypothesis was advanced:

The level of exchange rate has no effect on foreign direct investment inflows into the Ghanaian economy.

1.5 Significance of study

Given the problems identified, will help policy makers design and implement appropriate strategies to develop effective exchange rate policies for the country. The findings generated by the study will be of great benefits to government and policy makers responsible for the attraction and sustainability of FDI into the country. If the study finds that exchange rate and for that matter the other variables have significant impact on the inflows of FDI into the country, then there will be the need to implement appropriate policies that would help stabilize these macroeconomic variables.

However, if otherwise then policies would have to be implemented to improve on the already existing factors (the economy‟s growth potentials, political stability, credit provision by a nation‟s banking system, tariff policy, trade openness, and the size of the market among others) which attract FDI into Ghana.

Also, investors and other stakeholders in the economy such as industries that rely mostly on imported inputs will benefit from the information that will be revealed in this work so as to adopt the necessary measures and techniques to ensure stable profit margins which may be

affected without proper understanding on the exchange rate market (hedging will help). Equally this work could set off the mark for further research into the effect of the level of exchange rate on other macroeconomic variables or on this same variable to bring to light other factors that may be in play.

1.6 Scope of the Study

The study uses an annual time series data from the period 1980 to 2013 to investigate the effect that exchange rate has on FDI in Ghana. The collection of data on FDI was compiled from the United Nations Conference on Trade and Development (UNCTAD), 2005 whiles the other macroeconomic variables including Exchange rate were compiled from the World Bank data bank, 2014.

1.7 Organisation of the study

The study will consist of five chapters. The first chapter introduces the study with the background and research problem and objectives as well as the significance and scope of the study. The second chapter covers the review of both hypothetical and experimental writing. Chapter three will centre on development of hypothetical models and methodology that would be used for the data analysis. The model that would be used for the study would also be identified and discussed.

Chapter Four will also focus on the results and analysis of the study, whilst the last chapter brings to bare the conclusions of the study with the findings, recommendations and suggestions for further research in the area of the research.

CHAPTER TWO LITERATURE REVIEW

2.0 Introduction

The main objective of this paper was to ascertain the effect that exchange rate has on foreign direct investment in Ghana using the Autoregressive Distributed Lag (ARDL) model. To provide a detailed analysis of this phenomenon, this chapter deals with a review of the literature regarding the topic under consideration. It has three strands. The first strand describes the theories surrounding the topic of study, the second strand examines empirical literature of interest to the topic, and whiles the last strand draws conclusions from both the theoretical and empirical literature.

2.1 Definitions of Concepts

The concept of FDI has gained dominance in economic literature as well as various policies of countries because it‟s immense contribution to economic growth. As it is widely accepted that FDI positively impact the development of a nation, many countries have undertaken policies geared towards the attracting of inflows of FDI (Omoniyi&Omobitan, 2011). In fact Alfaro et al. (2006) recognizes net inflows of FDI moves from negative to positive as we move up the development ranking, thus less developed and developing countries are the major recipient of FDI, whereas countries at the latter end of the development ladder give more FDIs than they receive.

To grasp the concept of FDI, it is expedient to comprehend what it entails. FDI by definition, refers to the process whereby the inhabitants of one nation (the source country) purchase ownership of assets for the purpose of controlling production, distribution and other activities of a firm in another nation (the host country). Asafu-Adjaye J. (2015) asserts that a foreign investor is a group/company/person that participates in some form of productive activity in a country and finances such activity from funds obtained from foreign resources. With this definition, he excludes foreigners who engage in trade and those who engage in provision of temporal service. According to Denisia (2010), FDI is a unique form of capital that flows across borders, from the country of origin to the host country, which are found in the balance of payments. He further asserts that, the variable of interest is capitals flows and stocks; revenues gained from investments. Hence, in order to qualify as FDI the investment must afford the parent enterprise control over its foreign affiliate. Thus, the most important feature of these definitions is the term control and controlling interest.

2.2 Theories on Foreign Direct Investment

Literature on FDI actually commenced in the late 1970s with the British economist John Dunning, when he propounded the principle of ownership advantage, location advantage, and thirdly internationalization advantage of firms. However, a lot of theories have emerged afterwards and these theories have mainly focused on economic conditions and/ or government policies as factors influencing firms FDI decisions. Although, all such theories have made significant contribution to the field, there is no single universally accepted theory in this field of study (Denisia, 2010). Some of the underlying theories include The Industrial Organization Theory, The Location Theory, The internalization Theory, Dunning‟s Eclectic Theory and The Currency Area Theory and the Effect of the Exchange Rate.

2.2.1 The Industrial Organization Theory (IOH)

This theory, also known as the Ownership Advantage, says that, every other component unaltered, the more prominent the upper hands of the investing firms with respect to those of other firms the more they are plausible to take an interest in, or build, their foreign production (Dunning, 2001). Dunning (1991) opined that ownership advantages refer to any kind of income that generates assets, which enables firms to engage in foreign investment. To add to this, this FDI arises because of the difficulty in selling or leasing impalpable assets such as brand name, patent-secured technology, administrative dexterity, distribution and other firmspecific elements. These comparative advantages should be firm-specific, and should be large enough to overcome certain demerits that accompany FDI such as language barrier, culture, and the legal procedures. The reason is to protect the technology or formula used in producing the product. It is these firm-specific favorable circumstances that clarify the need for firms to contend effectively in an external business sector and hence engage in FDI. However,

the problem with the IOH is that, it is not able to explain the reasons a firm prefers to invest in one country over another (which the location hypothesis addresses).

2.2.2 The Location Theory

This theory avers that, the more immobile the factors of production (located in a host country) essential by the firms to combine with their own (domestic) competitive benefits, the more firms will choose to engage in FDI. Location decisions are founded on the associated benefits that come with specific location such as transportation costs, market size, telecommunication and the like. Hence, foreign firms would embrace exercises in order to increase the value of their dealings. Again, the level of earnings in the host nation comparative to earnings in the home nation is a relevant determinant of FDI. It is with this that nations such as India and China pull in labor-intensive production like footwear and textiles from high earning nations. Empirical proof on the hypothesis that cheap labor draws FDI is mixed. However, a possible justification for the inverse correlation between FDI and wages is provided by Lucas (1993) and Yanget al. (2000). According to Lucas (1993) a rise in the earning rate of the host nation implies an expansion in cost of production, which would dishearten production, and thus lead to FDI.

2.2.3 The Internalization Theory

This theory addresses the question of how multinational enterprises go abroad. It emanates from endeavors of firms to incorporate internally transactions that exit among markets. This is so because certain marketing cost can be salvaged by establishing a company. According to Dunning (1988), internalization is a preferred choice by multinationals especially in situations where the market does not exist, or functions poorly such that transaction costs of the external

route are high. The main focus for internalization is the existence of externalities in the factor and goods market. Thus if market in the intermediate product are imperfect, firms have the motivation to circumvent them by creating internal markets, such that the activities linked by the market are brought under common ownership control. In furtherance, this theory explains why firms prefer FDI to exporting and importing from foreign countries or shy away from licensing. Although the theory has the advantage of dealing with the problem of time lags and bargaining as well as buyer uncertainty, it is not certain that it is the external market‟s inefficiency in terms of high transaction costs and longer time lags that constitute the motive for internalization.

2.3 Theories of Exchange Rate

2.3.1 The Currency Areas Theory and the Effect of the Exchange Rate

This hypothesis explains FDI from the concept of international trade and the foreign exchange risk that it generates; based mainly on the claims of Itagaki (1981) and Cushman (1985). This theory postulates that, firms from countries with a strong currency tend to invest abroad, whiles firms from countries with a weak currency tend to be recipients of FDI. In other words, where there is an appreciation of a country‟s legal tender against the host nation‟s legal tender, it results in the reduction of FDI inflows and vice versa (Denisia, 2010). However, this hypothesis does not account for simultaneous flows in FDIs between countries with different currencies (Denisia, 2010).

2.4 Exchange Rate and FDI Linkages:

Despite the literature capturing this linkage, empirical studies has to a large extent been scanty; some exact findings posit some connection between the exchange rate and FDI inflows. Some

analyst capture the relationship between FDI and exchange rate by suggesting that robust FDI that emerge from exchange rate developments are because of relative wage differentials that are unimagined in the probable costs of project finance for FDI.

Others additionally show this relationship by agitating that flawed capital market implications lead to the rate of return on investment projects that rely on the capital market structure in various countries. However, the liaison between exchange rate and FDI can be captured in three popular arguments existing in earlier literature: „‟exchange rate sheltering hypothesis‟‟‟, the „‟production flexibility theory‟‟‟ and the „‟risk-aversion argument‟‟‟

The exchange rate sheltering hypothesis also known as the „‟Complacent manufacturer hypothesis‟‟‟ asserts that firms have an advantage in investing overseas when they are from nations whose monetary structure compels a premium and that true exchange rate reduction can be destructive to local production as it blocks foreign competition. Assessment of this hypothesis postulates it is incoherent with the way firms maximize profit. Furthermore, it is incapable to validate the reason behind the appreciation of diversification advantages by firms of strong currency economies benefit from regardless of foreign investor‟‟s constant uniformed decision making (Aliber1970; Lafrance and Schembri 2000). Goldberg and Kolstad (1995) in opposition to Froot and Stein (1991) amplified Campa‟‟s (1993) claim that an appreciation of host currency actually raises FDI inflows. Their view was however in contrast to earlier assertion that the decision to invest in a foreign country was not influenced by the exchange rate. There is a pool of literature available on the effect of exchange rate however; most of these studies are in contrast with each other. Some suggest a positive relationship, others suggest an inverse relationship, and still some have found no relationship.

The production flexibility theory posits that international firms are neither risk seeking nor risk-averse, rather, they are risk-neutral. This means that they „"by and large diversify internationally to upsurge the malleability of production in reaction to stuns under terms of free passage as prescribed by the operative exchange rate regime of an economy"" (Aizenman 1992, p897-910). Essentially, this model indicates that the fixed exchange rate regime is more conducive in attracting FDI inflows compared to the flexible exchange rate regime. Dixit and Pindyck (1994) used a different definition of „"production flexibility theory"". It is known as the „real option" model which is centred on the premise that a firm could have the preference to invest abroad, with exchange rate doubt possibly affecting the required return on the option. When the exchange rate fluctuates the essence of maintaining the possibility of not investing will rise (Phillips & Fredoun, 2008. p.7-8.) The risk-aversion theory posits that exchange rate risk comes about as a result of information asymmetry, macroeconomic, social elements, and spontaneous happenings that exist in a world full of imperfections as well as the diverse exchange rate regimes across the world. Froot and Stein (1991) in their study rose out „"wealth effects"" theory by employing an imperfect capital market approach to suggest that exchange rates operate on wealth to affect FDI flows. However, Cushman (1985) in his research called attention to a middle ground for the production flexibility theory and riskaversion theory. He disputes that when the firm wants to serve international markets it has the choice through either exports or foreign direct investment. By this, most firms will opt for FDI if exchange rate volatility rises or true exchange rate appreciation reduces the foreign cost of capital (Benassy-Quere et al., 2001).

2.5 Empirical Review

Numerous researchers have examined the exchange rate-FDI-relationship and effect for cross country, developing countries and developed economies using a wide variety of approaches. Nevertheless, there are few widely agreed on findings. Again, little has been undertaken in Ghana and this study seeks to analyze particularly the effect that exchange rate has on FDI in Ghana. Therefore in this section, a selected number of the empirical studies are reviewed.

The empirical studies reviewed are classified into three categories: (i) Review of Global Empirical Studies (ii) Review of Empirical Studies in Africa (iii) Review of Empirical Studies in Ghana and (iv) conclusions.

2.5.1 Review of Global Empirical Studies

Del Bo (2009) by employing the GARCH (Generalized Auto Regressive Heteroscadastic) technique, analyzes the effects of exchange rate and institutional uncertainty on the gravity of FDI flows from advanced and emerging economies in Italy, by giving a practical examination on a set of nations from 1970 to 2006. The study included fluctuation in exchange rate, institutional risk, trade openness and GDP as explanatory variables and FDI as the dependent variable. The result concludes that exchange rate volatility and political risk have undesirable effects on FDI inflows. Hence reduces FDI inflows.

According to Dar et al. (2004), there is a two-way agency of cause association between economic growth, the level of exchange rate and interest rate, political stability, and unemployment as factors that bring about FDI inflows for Pakistan using OLS and the cointegration technique over the period 1970 to 2002.

Ullah et al. (2012) explored the association of FDI with exchange rate and fluctuations in exchange rate by using data for the period 1980-2010 from the Pakistani economic data. The variables used in the study are FDI, exchange rate, trade openness, inflation, and exchange rate volatility. The study employed econometric methods including fluctuations analysis, Cointegration approach, causality test and stationarity test for the data analysis. In calculating for the volatility of exchange rate the research employed the ARCH and GARCH techniques. Findings from the study reveal that Rupee devaluation associates in a positive way with the FDI while the exchange rate volatility relates in a negative manner with the FDI. The study concludes that there is the need to drive down the exchange rate fluctuation and also to sustain the exchange rate in well-suited form.

Again, Froot and Stein (1991) asserted that the degree of exchange rate may affect FDI. By this, they claim that the fall in the host country currency against the home country currency raises the relative wealth of foreign investors thereby enhancing the attractiveness of the host country for FDI as firms are able to purchase assets in the host nation quite modestly. Hence a fall in the host country legal tender increases FDI into the host country and a rise in the host country legal tender reduces FDI. Froot and Stein (1991) utilize information on the industry level on US inward FDI the 1970s and 1980s to buttress their claim (Jayaratnam, 2003).

Nevertheless, Campa (1993) puts forth a distinct reason from that of Froot and Stein (1991) in analyzing the effect of the degree of exchange rate on FDI. In his model, the firm‟s choice to invest in a foreign country depends on the expectation of future profitability. With this, as the level of exchange rate goes higher, the greater the firm‟s prospects of future benefits from moving into a foreign market. As a result, Campa envisage that an rise in the host currency will

cause FDI into the host country to increase, all other things being equal, which is divergent to the projection of Froot and Stein (1991). Gorg and Wakelin (2001) do show that, Campa‟s empirical findings of examining the number of foreign investors coming into the US generate facts to buttress his model.

However, Gorg and Wakelin (2001) established immense input in this regard. Different from other findings, that took into account either outward or inward FDI, they took both into consideration. Their study analyzes empirically both direct investment from US to twelve countries and then investment from these twelve countries to the US. The study‟s calculations empirically provided distinct outcomes for US inward and outward FDI, that seem conflicting. The results showed a negative association between US inward investment and the worth of the dollar and a positive association between US outward investment and a rise in the currency of the host country.

Again, Ellahi (2011) inquired the impact of exchange rate fluctuation on foreign direct investment in Pakistan using the ARDL modeling approach over this period; 1980-2010. Real GDP, trade openness, real exchange rate, capital account balance and the fluctuation of exchange rate constituted the explanatory variables coupled with the insertion of a dummy variable for the structural adjustment program initiated in the 1980s. The study found out that real exchange rate significantly impacts foreign direct investment negatively. It further suggested that a 1% rise in real exchange rate leads to a 0.15% decrease in FDI.

In another contribution, Dhakal et al. (2010) showed that the fluctuation of exchange rate has a positive effect on FDI in some Asian countries. Takagi and Shi (2011) found that FDI rises

with an increase in fluctuation of exchange rates; however it falls with a decrease in the Japanese legal tender (Yen) against the legal tender of the recipient country in Asia.

Nagubadi and Zhang (2011) by their study showed that there is a positive effect of the reduction and fluctuation of the real exchange rate of the host country on bilateral FDI between United States and Canada.

In furtherance, Chaudhary et al. (2012) using ARDL, GARCH approach, ARCH/GARCH mixed modeling approach explored the impact of exchange rate fluctuation on foreign direct investment for some selected Asian economies over the period 1980 to 2010. The result concludes that positive link exists between FDI and exchange rate fluctuation.

Lastly, focusing on subgroups by country, majority of the findings for the USA, aid the assertion that a fall in the value of the dollar raises inflows foreign direct investment (Goldberg and Kolstand 1995; Froot and Stein 1991; McCorriston and Sheldon 1998). Nevertheless, exclusions are Campa (1993) and Alba et al. (2009) who identified that a rise in the value of the dollar raises inflows of foreign direct investment, and the levels of exchange rate are identified unimportant in Amuedo-Dorantes and pozo (2001). With regards to Australia, Faeth (2005) finds mixed outcomes, and Yang et al. (2000) find the exchange rate unimportant for an analogous time period. For European markets, Gast (2005) finds out that the value of the home country currency leads to foreign direct investment outflows rising. A parallel outcome is identified in Kosteletou and Liargovas (2000), however De Sousa and Lochard (2004) found that exchange rate is unimportant.

2.5.2 Review of Empirical Studies in Africa

From the African perspective, a lot of studies have been done in this area especially in recent times. This may be due to the over dependence of African countries on foreign capital flows as well as the inability to mobilize sufficient funds domestically for growth and economic development.

Kiat (2010) examined the impact that exchange rate and inflation has on foreign direct investment and then interaction of the parameters with economic development. A broad interior analysis was conducted in the South African economy and a comprehensive examination was conducted for the economies of thirty nations. The aim of the study is to find out the association of economic growth, FDI inflow, exchange rate and inflation. Linear regression analysis was used on data to ascertain the link of inward foreign direct investment, exchange rate, inflation and economic development. The outcome from the study revealed that foreign direct investment chases economic development while exchange rate positively affects FDI inflows and inflation negatively.

Osinubi et al. (2009) using two econometric techniques of the error correction mechanism (ECM) and ordinary least squares (OLS)analyze the effect of exchange rate volatility on foreign direct investment in Nigeria over the sample period 1970 to 2004. The results of the study showed that there is a positive and strong association between FDI and exchange rate. Hence, a fall in the value of the domestic currency results in a rise in the real FDI in Nigeria. By this outcome, the study suggested that the central Bank of Nigeria needs to achieve a stable exchange rate in real terms in order for production in home country is improved in order to

bring about a rise in real foreign direct investment along with external and internal balance function.

In another vein, Lemi and Asefa (2001) analyzed the effect of exchange rate and political instability and value vulnerability on inward FDI including the selected Ethiopian African markets. The period for the study was from 1975 to 1997. Using the autoregressive heteroscedastic (ARCH) and the GARCH approach the study concludes that the real exchange rate is statistically insignificant.

Furthermore, Olumuyiwa‟s (2003) using the ordinary least square (OLS) in Nigeria identified changes in the official exchange rate which is important for inflows of foreign direct investment in the agricultural field but insignificant for the manufacturing sector.

Again, Omankhanlen (2011) explored the impact of exchange rate and inflation on foreign direct investment and its linkage with economic growth in Nigeria using the OLS estimation technique for the annual time series data over the space of 1980-2009. The study found out that exchange rate has a positive impact on FDI into the Nigerian economy which is statistically significant. The results also generated that exchange rate is elastic to FDI and that by recommendation exchange rate should be maintained at heights that will guarantee rising levels of foreign direct investment inflow.

2.5.3 Review of Empirical Studies in Ghana

In Ghana not much extensive studies has been done on the effect of exchange on Foreign Direct Investment inflows. A larger number of papers on exchange rate movements and FDI concentrate on volatility of exchange rate.

Gyasi et al. (2000) using the Ordinary Least Square (OLS) estimation technique augmented by a firm level study identified that exchange rate, trade openness, the investment climate, democracy and land are key drivers of inward FDI into Ghana.

Nyarko and Amponsah (2011) explored the impact of exchange rate regime on foreign direct investment influx in Ghana. The study modeled the causal linkage between inward FDI and exchange rate regimes from the period 1970 to 2008. By employing the OLS and the cointegration technique to look into the fact, the study found out that exchange rate regime has no visible impact on Ghana‟s foreign direct investment. The linkage was weak since it was only identified to be significant at the 10% level.

Coleman and Tettey (2008) assessed the link between exchange rate fluctuation and FDI for sub Saharan African region considering the growing economy of Ghana. The study employed ARCH and GARCH models to identify the exchange rate fluctuations from 1970 to 2002. In addition the paper employed modern and strong econometric techniques of error correction mechanism (ECM) and co-integration to find the results of empirical analysis. The outcome of the study concluded that volatility of exchange rate has a negative influence on inward flow of foreign direct investment into Ghanaian economy.

Adu et al. (2014) using a Vector Autoregressive (VAR) model over the period 1970 to 2005. The study demonstrates theoretically that exchange rate volatility have an impact on foreign direct investment. The paper which is a detailed study gives or uses pair wise granger causality test. The study found out that a stable exchange rate improves foreign direct investment inflow into the country and likewise a high FDI inflow improves stability of exchange rate into the country. It further concludes that interest rate volatility directly affects exchange rate and market attractiveness which intends affects foreign direct investment in the long run. Finally, the paper recommends that government should implement policies that will stabilize the interest rate and the exchange rate.

2.5.4 Conclusions

It is evident that the level of exchange rate has some effect on FDI both globally and in Africa. However, what is worrying is the lack of conclusive evidence on the direction of impact. From the literature, majority of the studies conducted in the developed countries conclude that a fall in the value of the local currencies led to a more FDI inflows (Froot and Stein 1991). Campa(1993), Koldstad (1995) and others however had divergent views to Froot and Stein (1991). In the case of Ghana not ample work has been conducted on the effect of the level of exchange rate on foreign direct investment. Much work has rather concentrated on the volatility of exchange rate on inward foreign direct investment into the economy. Therefore there is the need to unravel what is the effect that the levels of exchange rate has on FDI inflows into the Ghanaian economy.

With these mixed results concerning the effects of exchange rate on FDI, it could be seen that, this situation may be attributed to the sample of data (sample size) used and the methodology employed by these studies.

Therefore, this study aims at contributing to the above studies by determining adequate effects of the level of exchange rate on foreign direct investment inflows into Ghana by using the ARDL model on an annual time series data from 1980 to 2013. It will also seek to establish the long term and short term effects of exchange rate on foreign direct investment inflows into the Ghanaian economy.

CHAPTER THREE METHODOLOGY

3.0 Introduction

This chapter explains the methodology employed in the analysis of the data set. It consists mainly of variable definitions and measurements, the source and type of the data used and the model specification and estimation technique as well as the a priori expectations of the selected variables. The chapter is divided into three broad sections. The first section identifies and gives a brief description of the variables to be used. Mention is also made of the data sources as well as the justification for the choice of the data used. The second section vividly states the model used in the analysis of the dataset. The third section gives the a priori expectations of the variables used in the model.

3.1 Model Specification

To capture the effect of exchange rate on FDI inflows in Ghana, a simple model is taken up and developed to depict the situation in Ghana as:

$$FDI = f(EXR, v) \quad \text{(3.1)}$$

Where, FDI is a function of exchange rate (EXR) and v control variables that can have an effect on inward Foreign Direct Investment over the given period.

The model was linearized to be in a log-linear form for estimation and is as follows;

$$\ln FDI_t = \beta_o + \beta_1 \ln EXR_t + \beta_2 \ln ERV_t + \beta_3 \ln TO_t + \beta_4 \ln INT_t + \beta_5 \ln INF_t + \beta_6 \ln GDP_t + \varepsilon_t \quad \text{(3.2)}$$

Where, ln*FDI* = natural log of Foreign Direct Investment which is also the dependent variable, whiles the explanatory variables are;ln*EXR*= natural log of Exchange rate, ln*ERV* = natural log of Exchange rate volatility, ln*TO* = natural log Trade openness, ln*INT* = natural log of Interest rate, ln*INF* = natural log of Inflation, ln*GDP*= natural log of real gross domestic product. The error term, ε_t is assumed to be independent and identically distributed and t= time subscript represents the time of each series. The variables employed in the model are estimated in their natural logarithm form. This is to generate interpretation more meaningful and robust.

3.1.1 Description of Variables

A succinct description of the variables to be estimated in this empirical analysis is given below:

Foreign Direct Investment (FDI): It is defined as a foreign investor establishing a production facility in a country other than that of his own country. It is thought to be a key drive to economic enhancement and development in growing economies through its capability of generating advanced technologies. The extent of this variable is a fine gauge of the relative attractive nature of an economy to foreign investors. It is calculated by taking the levels of inward foreign direct investments into the country in monetary terms (US dollars at current prices).

Exchange Rate (EXR): This is the number of units of one currency that is exchanged for a unit of another currency. In other words, it shows the worth of a country‟s currency relative to the other country‟s currency. The measure for the exchange rate in the study was the nominal

effective exchange rate (NEEX). The nominal effective exchange rate is the measure of the value of a currency against a weighted average of several foreign currencies. An increase in the NEEX rate indicates an appreciation of the currency and a decrease indicates depreciation. The difference between the volume and value of a country‟s import and export affects its level of exchange rate with other countries. This variable is needful in order to measure the potential of a county‟s currency to attract FDI inflows (inward FDI). Data for the nominal effective exchange rate was obtained from the International Financial Statistics of the IMF, 2014.

Exchange rate volatility (ERV): This variable is defined as the adjusted relative change in exchange rate squared adopted from Dahkal (2010). Its measurement is taken as the standard deviation of the exchange rate.

Trade Openness (TO): It is termed as the measure of a country‟s ability to implement economic policies that either serve as a restriction or promote trade between countries. Its measurement is taken as the summation of the ratio of exported and imported goods and services to GDP.

Interest rate (INT): It is simply defined as the cost of borrowing. It is measured as the rate of interest on commercial bank loans. A very high level of interest rate operating in an economy makes doing business in that economy very unattractive. It has the potential of driving away investors.

Inflation (INF): It is defined as the persistent rise in the overall general price level in an economy. The inflation rate gives an indication of how prices of goods and service are changing

within an economy. To measure this variable a number of goods that are representative of the economy are put together into what is referred to as a „"market basket"". The cost of this basket is then compared over time. This results in a price index, which is the cost of the market basket toady as a percentage of the cost of that identical basket in the starting year. The main price index used for the measure of inflation in this study is the consumer price index (A measure of price changes in consumer goods and services). One of the key drivers of FDI inflows is a stable macroeconomic environment of which the inflation rate is part. A stable inflation rate boosts investor confidence in operating in an economy.

Real Gross Domestic Product (Gdp): The monetary worth of all goods and services created in an economy usually within a period of one year is termed as GDP. It shows the total capacity of the recipient economy. It is measured by adding up the monetary value of all goods and services produced in a country within a period of one year. Its addition to the model is required to control the supply of Foreign Direct Investment (Blonigen, 1997). The empirical literature on FDI and the distinguishing feature of the Ghanaian phenomenon was the premise on which the variables were selected.

3.1.2 A Priori Expectation

Table 3.1 A Priori Expected sign

Independent Variables	Expected sign	Explanation
Exchange Rate	(-)	EXR is expected to have a negative effect on FDI
Exchange Rate Volatility	(-)	ERV is expected to have a negative effect on FDI
Trade Openness	(+)	TO is expected to have a positive effect on FDI

Interest Rate	(-)	INT is expected to have a negative effect on FDI
Inflation	(-)	INF is expected to have a negative effect on FDI
Real Gross Domestic Product	(+)	GDP is expected to have a positive effect on FDI

3.1.3 Data Sources and Type

The data employed in the empirical analysis was mainly secondary data gathered from 1980 to 2013, a 34-year period. Time series data on nominal exchange rate was extracted the IMF (2014). Those of inflation, interest rate, trade openness as well as real GDP were sourced from the World Bank (2014). Data on foreign direct investment inflows was taken from UNCTAD (2014).

3.2 Estimation Strategy

This aspect is a discussion of the time series methodologies that will be employed in examining the dataset. Unit root test for stationarity, ADF-Test, PP-Test, Auto Regressive Lag (ARDL) model, Cointegration test and the Error Correction Mechanism. The E-views statistical software is used to carry out the time series methods.

3.2.1 Exploratory Data Analysis

The methods employed in this aspect give a graphical as well as statistical description of the dataset. The minimum and maximum values as well as the mean and standard for the independent and dependent variables would be ascertained through the use of graphs and descriptive statistics. This is to help in gaining insight into the data set, extract relevant variables and their distributions as well as identify other anomalies.

3.2.2 Estimation Technique

3.2.2.1 Stationary Test

Most studies that employ the use of macroeconomic variables in their analysis usually identify that these variables are non-stationary at their levels. A stochastic process is identified as fixed if it has its mean and variance to be unchanging overtime, as well as having the value of its covariance between two periods, being dependent solely on the interval between the periods and not actually when the covariance is taken into account. When the variables are found to be non-static then its estimation may yield spurious results which have no economic meaning.

The time series feature of each variable in the study is assessed by using the ADF-test to assess non-stationary taken from Dickey and Fuller (1981) and Fuller (1996). The PP-test is used also following Phillips (1986) and Phillips and Perron (1988).

With the purpose of checking for stability of the variables captured in the model, the ADF test is employed where the regression equation is developed as follow:

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \beta t + \sum_{k=1}^{p} \gamma_k \Delta Y_{t-1} + \varepsilon_t \quad \text{..... (3.3)}$$

Where,

- Y_t is the variable in question.
- t is the time trend
- Δ is the difference operator.
- ε_t is the stochastic process.

For all t=1, 2…34

Using equation **(3.3)** the following hypothesis is tested for stationarity.

H_o: δ=0 (y_t is non-stationary)

H_1: δ<0 (y_t is stationary)

Dickey and Fuller employed τ-statistic in place of the t-statistic which they showed to be unsuitable. If the computed τ-statistic is below the critical values as created by MacKinnon (1996), the null hypothesis is rejected and the alternate hypothesis is accepted that the variable is stationary. The research as well utilizes Phillip-Perron (PP) test as an alternate mechanism to confirm the results of the ADF-test which is fallacious in the existence of structural breaks. To conclude on the null hypothesis, the Phillip-Perron (PP) test also involves comparing a PP test statistic with the critical values by Mackinnon (1996). This test uses a correction factor that calculates the variance of the error process using the NeweyWest formula which is quite different from the ADF-test.

3.2.2.2 ARDL Approach to Cointegration

The ARDL model was presented by Pesaran et al. (2001) so as to integrate into one estimation variables which are integrated of order zero and one. Hence, if your variables are stationary at order zero then it is necessary to utilize Ordinary Least Square estimation technique and if all are non-stationary at order one then it is best to do VECM (Johanson Approach). This is appropriate to follow in order not to generate spurious results.

The Auto regressive distributed lag (ARDL) model is the approximation process that is selected for the study. It was utilized for the analyzing the equation specified with the aim of identifying the short term and long term estimates. The ARDL was suitable for this estimation because it has advantages that makes it over ride other parallel approaches including (i) it prevents the advance checking demands of other approaches that need all variables to be in similar order of

integration, either I(o), or I(1) . However, the variables considered in the model are obviously of different orders of stationarity hence makes the ARDL model the most suitable, (ii) it suitable and appropriate for identifying the cointegration of small samples (Ghatak and Siddiki 2001). (iii) Another important fact about the ARDL model is that it can estimate long-term and short-term components of model simultaneously (Narayan and Narayan, 2006). The estimation approach involves two steps.

The initial step consist of the application of bounds cointegration test (F-test) for identifying the presence of long term link and the subsequent step after establishing the long run relationship, involves identifying the short and long run estimates of the model by the error correction mechanism.

More so, instead of imposing restrictions and concluding on the dependent variable, the Bound Test method distinguishes between independent and dependent variable through the usual F-test. Furthermore, Narayan (2004) noted that, the unrestricted equilibrium correction model will probably have superior statistical qualities compared to Engel-Granger method, as it does not push short-run dynamics into residual terms (Pattichis 1999; Banerge et al., 1998). Thus, the superiority of the bound test method to cointegration in relation to generating efficient results for a relatively small sample study like this is assured. The mechanism by

Pesaran et al. (2001) necessitates the use of the ARDL model to specify an Unrestricted Error Correction Model (UECM). Assuming, there is a unique long-run association between FDI and Exchange rate the ARDL UECM can be specified as;

$$\Delta Y_t = \alpha_{oi} y_{t-i} \quad Y X_{j1t-j} \Delta \Delta_k X_{2t-k} \Delta \Delta \beta_0 y_{t-1} \beta_{11} X_{t-1} \beta_{221} X_{t-1} e_t \ \ldots\ldots\ldots (3.4)$$

In equation (3.4) above,

- Y is the dependent variable
- The X‟s are the independent variables
- □,□,□ are the parameters to be assessed
- *e*is an error term.

The next step is to determine the maximum lag value by employing either one or several of the „‟information criteria‟‟‟- AIC, Schwarz (Bayes) Criterion (SC), HQ among others. Once this is selected, the next is to test for the cointegration between FDI and exchange rate. To start with, equation (3.4) is analysed by ordinary least square (OLS) method. Once the estimated coefficient of the lagged levels variables of (3.4) is restricted, the long-run association between FDI and exchange rate can be established.

3.2.2.3 ARDL Bounds test of cointegration

The existence of cointegration can be mapped out by running an F-test for the joint significance of the coefficients of the variables at their lagged levels. This is attained by testing the following hypothesis:

H_o:□ □ □ □ □ □ □$_o$□ □ □ □ □ □

□$_1$ 2 3 4 5 6 0 (no long-run relationship exist) against the alternative

H_1:□ □ □ □ □ □ □$_o$□ □ □ □ □ □ □□$_1$ 2 3 4 5 6 0(a long-run relationship exists)

The calculated F-statistic value will be compared to the critical values created by Pesaran et al. (2001). For different numbers of variables (Xs) the lower and upper bounds on the critical values are given. For every situation, the lower bound is centred upon the intuition that all explanatory variables X_t are I(0), and the upper bound is centred upon the intuition that all

explanatory variables X_t are I(1). If the calculated F-statistic falls below the lower bound critical value, then we do not reject the null hypothesis that there is no cointegration among the variables. However, if the F-statistic exceeds the upper bound critical value, then we reject the null hypothesis that there exists a long-term association (cointegration) among the variables under study. Finally, if the calculated F-statistic lies within the lower and upper bound critical values, then the test is inconclusive. Once the bounds test leads to a conclusion of cointegration, a meaningful estimate of the long-term association among the variables can be done from the equation below:

$$\Delta Y_t = \alpha_{01} Y_{t-1} + \alpha_t + \sum_{k=1}^{p} \alpha_k \Delta Y_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots (3.3)$$

as well as the usual UECM:

$$\Delta Y_t = \alpha_{oi} y_{t-i} + Y X_j \quad {}_{1t-j} \sum \sum_k X_{2t-k} + \alpha_0 y_{t-1} + \alpha_{1\,1\,1} X_{t-} \sum \sum_{2\,2\,1} X_{t-} + e_t \quad \ldots\ldots\ldots\ldots\ldots (3.4)$$

Lastly, the short-run dynamics coefficients are acquired by estimating the error correction model related with the long term estimates. This is given as follows:

$$\Delta Y_t = \alpha_{oi} y_{t-i} + Y X_{j1t-j} \sum \sum_k X_{2t-k} + \alpha_0 y_{t-1} + \alpha_{1\,1\,1} X_{t-} \sum \alpha_{2\,2\,1} X_{t-} ECM_{t-1} + e_t \quad \ldots\ldots (3.5)$$

Where,

- ECM_{t-1} is the one period error correction term
- α is the speed of adjustment

The coefficient α measures the speed of adjustment to reach equilibrium in the case of a disturbance to the system.

3.3 Forecast Error Variance Decomposition (VDF).

In order to test for the response of the dependent variable (FDI) to the shocks from other variables included in the model especially the exchange rate, the study employs the VDF. The VDF provides information on the time paths of the variables and their response to shocks from other variables included in the model. The VDF is conducted to elaborate the dynamic relations between two variables. The VDF is conducted to determine whether a proportion of forecast variance of one variable is attributed to the effects of the other variable. The Variance decomposition shows the amount of information each of the variables contribute in explaining other variables in the model. It is able to separate the variation in the endogenous variable into separate shock components.

3.4 Stability Test

In order to check if the all regression estimates throughout the sample period are stable, the stability test is performed. Plots of Cumulative Sum (CUSUM) and Cumulative Sum of Squares 52 (CUSUMQ) test as postulated by Brown et al (1975) are employed. If the movement of the CUSUM and CUSUMQ residuals lies outside the critical lines then it can be concluded that there is instability in the estimated coefficient and parameter variance over the sample period. On the contrary, if the movements of the CUSUM and CUSUMQ lie within the critical lines then it can be concluded that there is stability among the estimations.

CHAPTER FOUR EMPIRICAL RESULTS, ANALYSIS AND DISCUSSIONS

4.0 Introduction

In the previous chapter, the ARDL model was presented as the econometric technique to be employed in the study to examine the effect of exchange rate on FDI inflows. The error correction model was also another econometric technique that was employed to show the short run dynamics of the effect of exchange rate on FDI.

This chapter shows the results when the ARDL econometric technique is applied to empirically ascertained the effect that exchange rate has on FDI inflows in Ghana from the period 1980-

2013. The chapter is presented in five parts. The first part gives the descriptive statistics as well as the graphical tends between the variables of the study whiles the second section presents results of unit roots test. The third section gives the results of the ARDL bounds test of cointegration. The fourth section presents the results of the error correction model and finally the fifth section which summarizes the chapter.

4.1 Descriptive Statistical Analysis

This section examines the distribution of the data using mean, median and standard deviation. The skewness, Kurtosis and Jacque-Bera tests were used to ascertain the normality of distribution of the variables. The statistics are shown in Table 4.1. From Table 4.1, the rate of flow in the levels of FDI averaged 576.58% while that of NEEX rate averaged 24621.82%. GDP growth averaged 8.52%. As compared to a developing country standard, this figure is considered very high.

Table 4.1: Summary statistics of the variables, 1980-2013

	lnFDI_levels	**lnNEEX_rate**	**lnERV**	**lnGDP**	**LnINF**	**lnINT**	**lnTO**
Mean	576.5835	24621.82	0.320812	8.52E+09	28.91954	23.36235	0.627354
Median	108.2600	807.0809	0.117686	7.26E+09	23.43049	20.25000	0.656385
Maximum	3293.430	214782.1	1.952475	1.99E+10	122.8745	45.00000	1.160484
Minimum	2.000000	74.39062	0.011605	3.82E+09	8.726837	10.50000	0.063203
Std.Deviation	1070.413	61711.70	0.493983	4.35E+09	26.36889	9.736091	0.310865
Skewness	1.852737	2.396903	2.406962	1.086409	2.471703	0.877931	-0.19004
Kurtosis	4.715514	6.888752	7.742013	3.337215	8.993834	2.899994	1.995503

Jarque-Bera	23.62083	53.97921	64.68578	6.849377	85.51469	4.381826	1.634011
Probability	0.000007	0.000000	0.000000	0.032559	0.000000	0.111815	0.441752
Sum	19603.84	837141.9	10.90761	2.90E+11	983.2643	794.3200	21.33005
Sum Sq.Dev.	37810865	1.26E+11	8.052625	6.25E+20	22945.50	3128.118	3.189019

Source: Author‟s computation from WDI, 2012

Inflation and Interest rate, on the other hand, averaged 28.91% and 23.36% respectively over the period of study. These rates of inflation and interest rates are relatively too high to attract potential investors especially FDI‟s into the country. The nominal effective exchange rate (NEEX) coupled with the rates of inflation and interest rates might have led to the decline in the rate of growth in the levels of FDI as stated in the problem of the study.

The NEEX rate has a larger standard deviation among all the variables followed by the FDI, which attests to the general intuition that FDI and NEEX rate are highly volatile. Again, the standard deviation compared to mean for FDI, NEEX rate and the interest rate is very high which indicates high coefficient of variation. The others are quite low and hence low coefficient of variation.

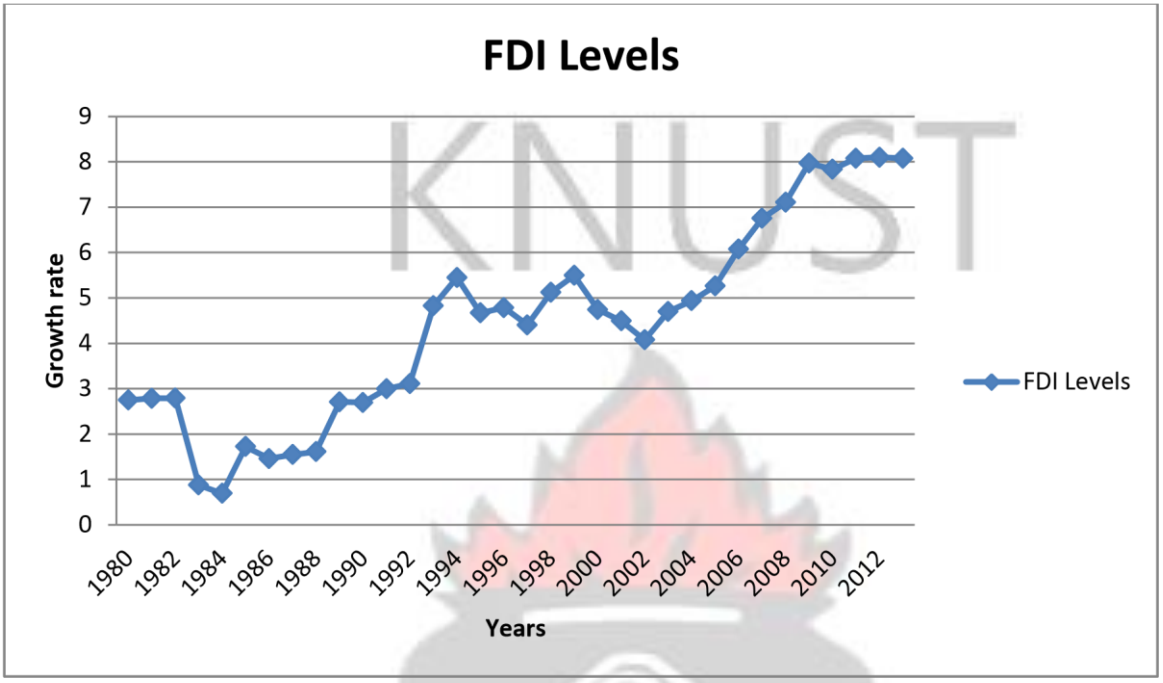
The range of variation between the maximum and minimum value for all the variables are very high. The remarkable maximum value for the flow in Foreign Direct Investment levels was attributable to the very high Foreign Direct Investment inflows in the 1990‟s and the early 2000‟s that showed a structural change in FDI inflows in Ghana. The probable explanation to this structural change in FDI flows in 1994 and 1995 is due to the formation GIPC and free

zone act respectively. These initiatives helped to provide a conductive environment for investment promotion.

With the exclusion of the trade openness (TO), all the variables were positively skewed, meaning that they have been on the rise. In other words, there have been many years of high levels compared to low levels in the values of these variables.

The variables on the whole do not follow normal distribution by the J-B test; that is, the null hypothesis that the variables are not normally distributed was rejected.

Figure 4.1: Annual trend of Growth rate of FDI levels in Ghana



Source: Author"s computation from WDI, 2012.

Figure 4.1 shows that from 1980 to 1992, FDI inflow was sluggish, oscillated from 1993 to 2003 and increased sharply from 2004 to 2009. From 2009 to 2013 there have been fluctuations with a fall in 2013.

4.2 Trend of Foreign Direct Investment

When Rawlings took power, he implemented an anti-business stance; economic growth fell to -3.2% with a growth rate in FDI inflow of 2.88% in 1981. The economy experienced a further negative growth rate of 3.5% in 1981 to 6.9% in 1982 in his second advent; however, the growth rate of FDI inflows stayed constant at 2.79%.

The government of Ghana in 1983 initiated the Economic Recovery Programme (ERP) and later the Structural Adjustment Programme (SAP) as policies basically to turn around the post-independence economic decline and accelerate the promotion of value-added FDI inflows into

the Ghanaian economy. Three historical periods of FDI flows into the Ghanaian economy can be realized since the inception of the ERP in 1983. There was a sluggish FDI net inflow in the first period from 1983 to 1988, with an average growth rate of 1.24% per annum, and the maximum and minimum growth rate during the period being 0.67% in 1984 and 1.72% in 1985 respectively. The establishment of the new investment code (PNDCL
116) that was to serve as the central Investment promotion Agency accounted for the high FDI inflow in 1985.

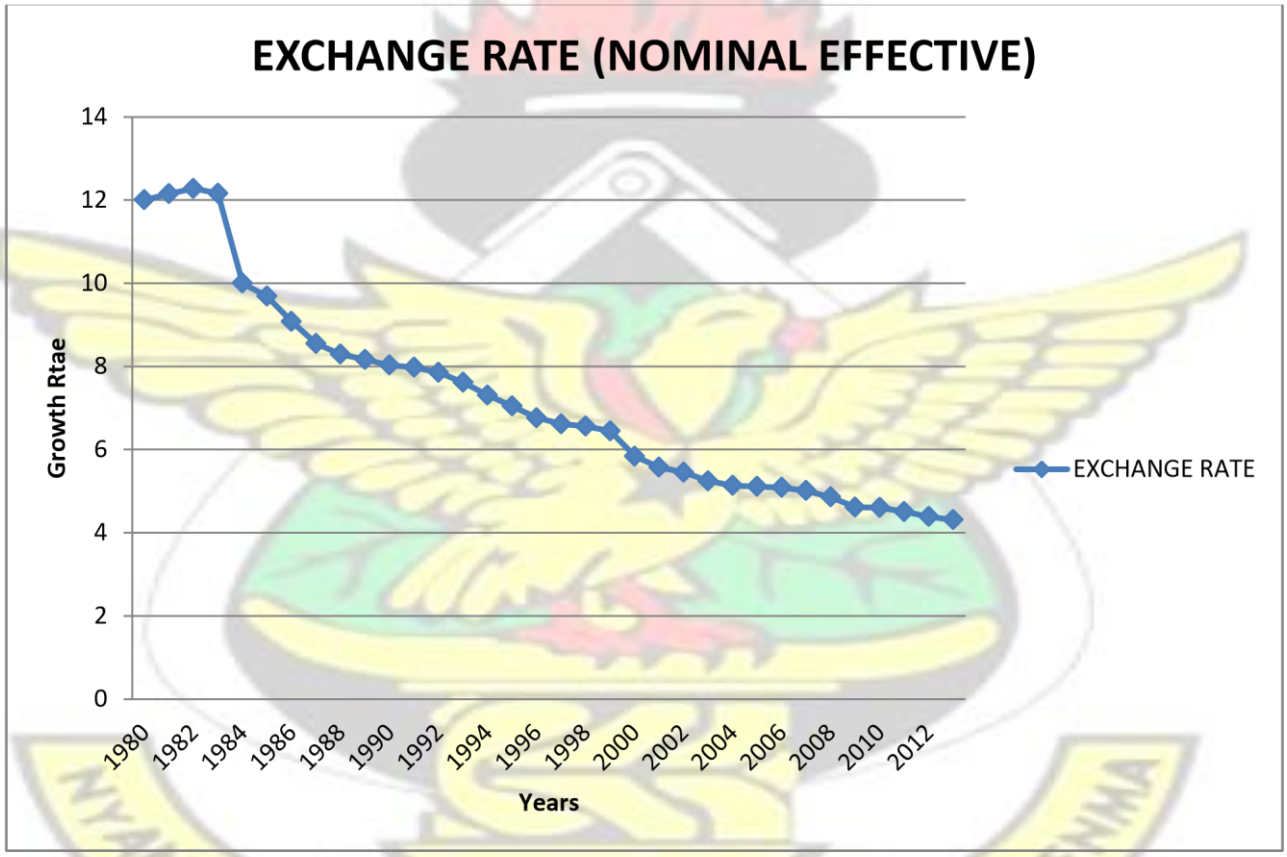
Moderate inflows were also recorded in the second period beginning from 1989 to 1992. On the average, the growth rate of inflows was 2.91% yearly with maximum and minimum growth rate being 3.11% in 1992 and 2.69% in 1990, respectively. Added to this, there was a significant and oscillatory growth rate in FDI inflows in the period 1993 to 1996, which peaked at 5.45% in 1994 (with the sale of Ashanti Goldfields Company (AGC) to private investors), but declined to 4.66% in 1995 before surging back to 4.78% in 1996. The peaked FDI inflow growth rate in 1994 was as a result of the revision of investment code which ultimately led to the passing of the GIPC Act, 1994 (Act 478). The GIPC was also established by the government to encourage and promote investment in the country as well as to coordinate investment in the country.

Growth rate of FDI flows were fluctuating from the period of 1996 to 2003 including a decline from 4.78% to 4.40% from 1996 to 1997 respectively, then a subsequent peak of 5.49% in 1999 and then a fall to 4.74% the subsequent year. This decreased further to 4.49% in 2001 and then to 4.07% in 2002 due to the attack on the United States in September 2001 and the subsequent fall of FDI values from 41% in 2001 to 21% in 2002 globally (UNCTAD,

2003). However, in 2003 there was a recovery of FDI growth rate to 4.70% owing to the immense boost in FDI with the amalgamation of Ashanti Goldfields and AngloGold and the commencement of a US$400m gold mine investment by the US firm, Newmont.

The period 2004-2011 also witnessed significant and increasing FDI flows, which reached a growth rate peak of 8.08% in 2011 owing to the privatization of Ashanti GoldfieldsCompany. The trend is shown in Figure 4.1

Figure 4.2: Annual Trend of Growth rate in Exchange rate in Ghana from 1980 to 2013



Source: Author"s Own Computation

Figure 4.2 shows the movements in exchange rate of the years under consideration. The graph shows an increase in growth rate of the cedi from 1980 to 1982 and then a sharp decline from 1983 to 1984. From that year onwards the graph shows that the Ghanaian cedi has been depreciating in growth consistently over the years.

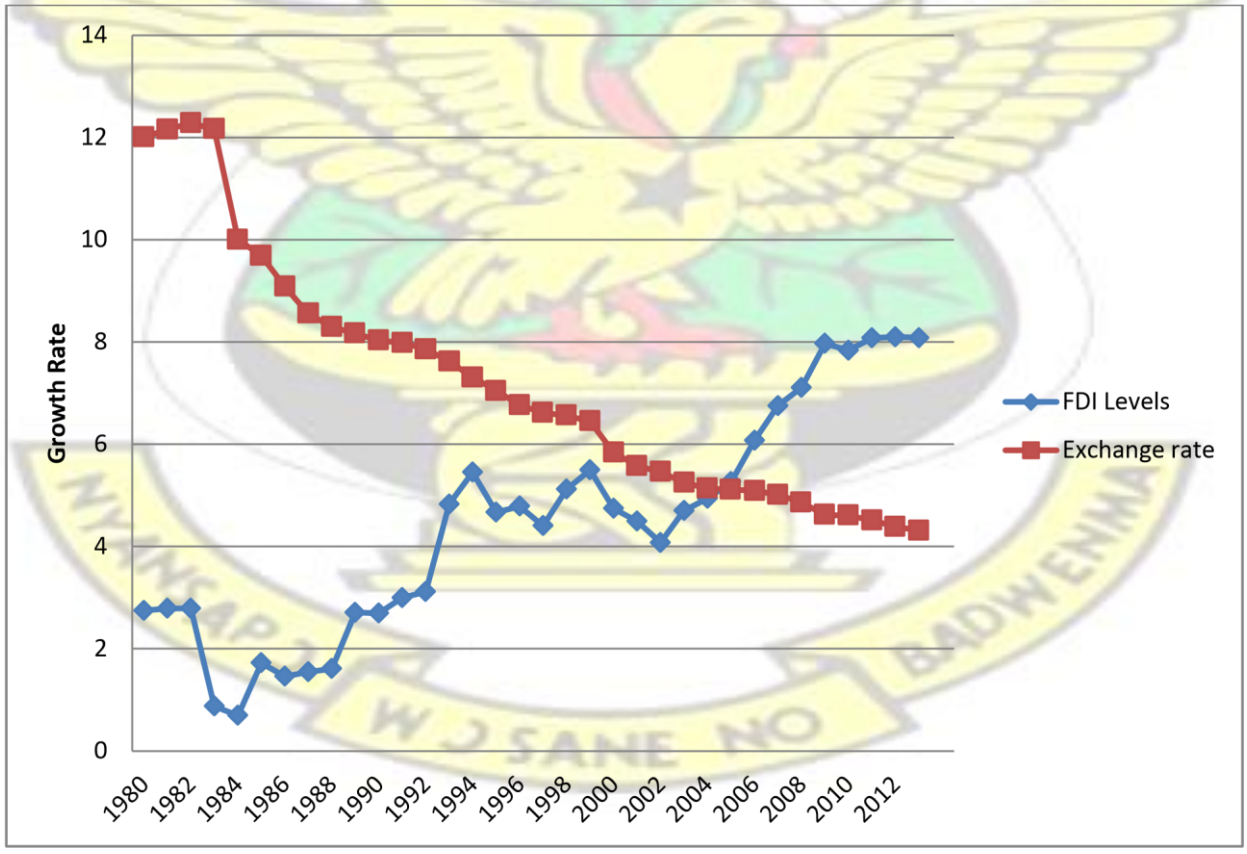
4.3 Trend in Nominal Effective Exchange rate In Ghana

Ever since Ghana changed its currency from pounds sterling to the Cedi in July 1965, the country‟s cedi has continually depreciated against major currencies like U.S dollar and the British pounds. At that stage however, it was merely a name change without an alteration in the external value of the currency, and the cedi was equivalent to US$ 1.17.Then on February 23, 1967, the currency unit was subsequently referred to as New Cedi, was exchanged for the old cedi at a rate of N¢=¢1.20. Since there was an equivalent change in the external exchange rate, the effective foreign exchange price of the New Cedi remained unchanged. In furtherance of this, the exchange rate of the New Cedi against the US dollar became N¢1=US$1.40. According to Olajide,1975 the continual decline in the value of the Ghana Cedi, allied with changes in Ghana‟s foreign policies caused a lot of political instability since independence.

From the period 1957 to 1992, Ghana took up a fixed exchange rate regime in the controlling of its exchange rate. The Ghanaian Cedi (¢) was pegged to the main convertible currencies in this period, particularly the American dollar and the British pound. The adoption of a fixed exchange regime in Ghana was therefore in line with the thinking of the time. Nevertheless, the country adopted the flexible exchange rate regime (June 1978) and with this the Cedi has been fluctuating for most part of its existence (Mumuni and Owusu-Afriyie, 2004). This adoption of the flexible exchange rate regime was embarked upon so that in terms of the US dollar, the Cedi could be adjusted to display the underpinning economic, financial and balance of payments situation of the country. The cedi from that time forward has experienced an almost continuous depreciation in value.

For instance, on annual basis in the year 1991, the growth rate of the cedi was 7.97%. The Ghanaian cedi in 1992 saw a further decrease in growth rate of 7.85%. In 1994 decrease in growth rate of the cedi was 7.31% and in 1996, it was 6.76%. Again the cedi saw depreciation in growth rate of 6.61% in 1997 and 6.55% in 1998.In the year 2000, the cedi depreciated in growth rate by about 5.83%. This phenomenon could be linked to declining prices of Ghana‟s main exports goods, such as timber, cocoa and Gold. In the year 2002 and 2008 the cedi continued is depreciating run by showing depreciation in growth rate of 5.45% and 4.85% respectively. From that year (2008) it has experienced a perpetual fall in value as shown in Figure 4.2.

Figure 4.3: Growth rate of FDI levels and Exchange rate in Ghana from 1980 to 2013



Source: Author‟s Own Computation

Figure 4.3 reveals that there seems to be some sort of negative correlation between the growth rate of the levels of FDI and the level of Exchange rate. But the econometric testing ahead will more convincingly show the relationship between the trend in the levels of FDI and the levels of Exchange rate in Ghana for the period of study.

4.4 Unit Root Tests

As expected, almost all economic variables are not stationary at their plane form and are likely to generate coefficients inconsistence and hence produce spurious empirical results. Therefore, the ADF and PP-test were applied to find out the stationarity of all the variables employed in the study. These two tests alternate with each other as the PP test is less restrictive than the ADF test and its outcomes are authentic even in the presence of autocorrelation and heteroscedasticity. The results of the ADF test show that all the variables were stationary at first difference with the exception of inflation which was stationary at the levels or constant. It therefore follows that all the other variables excluding inflation were integrated to the order of1 that is I (1). Hence inflation was integrated to the order of 0 that is
I (0). The PP test showed slightly different results from the ADF test. With the PP test, LnFDI_levels, lnERV, LnTO, and LnINT were stationary at first difference whiles LnNEEX_rate, LnGDP and LnINF were stationary at the level. The results of both tests for unit root for all variables are presented in Table 4.2 and Table 4.3.

Table 4.2: Test for Unit Root in the Variables at their Log Levels

Variables in level	**ADF test**		**PP test**	
	With constant	with constant and trend	with constant	with constant and trend
LnFDI_Levels	-0.169167	-2.714824	0.781687	-0.653559
LnNEEX_rate	-2.001108	-1.484855	-4.222222***	-1.877630
LnERV	-0.947940	-0.642625	-1.222217	-1.000607
LnGDP	-3.047471**	-0.090518	9.067645***	-3.665682**
LnTO	-1.388219	-1.437311	-1.386040	-1.830847
LnINF	-3.525199**		-4.499567***	
LnINT	-1.900681	-2.054051	-1.754109	-1.772921

Source**:** Author"s own construction
*Mackinnon (1996) one-sided p-values *significant at 10% level; **significant at 5% level; ***significant at 1% level

Table 4.3: Test for Unit Root in the Variables at their log difference

Variables	ADF test		PP test	
	With constant	with constant and trend	with constant	with constant and trend
LnFDI_Levels	-5.119580***	-6.815191***	-6.037410***	6.708149***
LnNEEX_rate	-5.012954***	-5.112472***	-4.814199***	-5.188174***
LnERV	-15.10594***	1.426944	-9.233538***	11.93800***
LnGDP	-4.727193***	0.804092	-1.319966	-2.951493
LnTO	-4.601966***	-5.01876***	-5.034864***	-4.983041***
LnINT	-7.191880***	-6.502541***	-6.475323***	6.480949***

Source: Author"s own construction

*Mackinnon (1996) one-sided p-values *significant at 10% level; **significant at 5% level; ***significant at 1% level

From the outcomes of the Unit root test in Tables 4.2 and 4.3 it can be observed that the variables were stationary at the first difference using the ADF test and the PP test. Therefore to eliminate the potential of generating spurious empirical results, the variables were estimated at their first difference.

4.5 Tests for Cointegration

The first difference of the logs of the variables of FDI at levels, nominal effective exchange rate, real GDP, exchange rate volatility, trade openness, inflation and interest were used for the cointegration test. The cointegration test is performed basically to ascertain whether there is a long run association between the dependent and the independent variables. The results of the bounds test are presented in the Table 4.3.

4.6 ARDL Bounds Test for Cointegration

Table 4.4: Bounds test for cointegration

Test Statistic	Value	K
F-statistic	4.995711***	6

Source: Authors own construction Notes:*** Statistical significance at 1% level; ** Statistical significance at 5% level; * Statistical significance at 10% level.

The ARDL bounds test gives a 1% upper bound and lower bound of 4.43 and 3.15.

The ARDL test of co-integration was employed to test the long-run association between the levels of FDI, nominal effective exchange rate, exchange rate volatility, real gross domestic product, inflation, interest rate and trade openness. The results of bound test of co-integration, is shown in Table 4.4. The ARDL bounds test revealed empirically that the value of the calculated F-statistic of 4.995711 is greater than the upper bound critical value, of 4.43, given

by Pesaran et al. (2001) for 1% level of significance. Therefore, the null hypothesis of no cointegration was rejected and the alternative hypothesis of the presence of co-integration between the dependent and the explanatory variables was accepted. Therefore, the empirical results concludes that a long run relationship between the levels of FDI, nominal effective exchange rate, exchange rate volatility, real GDP, inflation, interest rate and trade openness exist.

Once, cointegration has been established a meaningful assessment of the long run relationship among the variables can be estimated from equation 3.2. The results of the long run coefficients are presented in Table 4.5

4.7 Long Run Results.

The study analyse the long run dynamics among the variables in model 3.2. The results of the long run dynamics are shown in Table 4.5

Table 4.5: Estimated long-run coefficients for equation 3.3

Variable	Coefficient	Std. Error	t-Statistic
LNINFL	-2.483455*	1.354024	-1.834129
LNINT	2.445867*	1.269852	1.926105
LNNEEX_RATE	-1.523327	0.982778	-1.550021
LNERV	-0.413101	0.387430	-1.066260
LNTO	-4.576487**	2.018370	-2.267417
LNGDP	2.701065	2.787873	0.968862
C	-49.598538	71.296097	-0.695670

Source: Authors own construction

Notes:*** Statistical significance at 1% level; ** Statistical significance at 5% level; * Statistical significance at 10% level

The empirical results from Table 4.5 reveal that, inflation has a negative and statistically significant effect on FDI into Ghana at 10% significance level. This shows that when inflation increases by 1% FDI decreases by 2.48% in the long run.

The result of this study confirms the empirical works of Udoh and Egwaikhide (2008), Ade et al. (2012) and Djokoto (2012).The intuition behind this is that an expansionary macroeconomic policy that increases, the general price levels will serve as a hindrance to FDI inflows into Ghana.

Again, the results show that real GDP has a positive effect on FDI in Ghana. However, it had no statistical significant effect on FDI. This means that in the Ghanaian economy GDP does not play any role in the receipt of FDI in the long run. Table 4.5 show that when the economy grows by 1%, FDI increases by 2.70%. This result concur with the work of Edoumiek (2009) who found out that growth positively impact FDI inflows in Nigeria but oppose the work of Sackey et al. (2013) who discovered that economic growth has no effect on FDI inflows in Ghana.

The effect of interest on FDI is positive and statistically significant. Also, as interest rate increases by 1%, FDI increase by 2.45%. This is supported by the work of Alimi (2014) who had similar results. The effects that interest rate have on FDI into the Ghanaian economy can be attributed to improvement in the financial sector development as well as the availability of sufficient funds in the domestic capital market. Hence, multinational companies would prefer to look for funds within the domestic capital market.

Furthermore, the findings show that the level of trade openness has a negative and statistically significant effect on FDI into the economy.

This sign contradicts a prior expectation of a positive effect of trade openness on FDI, which is not surprising. This is because, even though reductions in trade barriers are supposed to promote the attraction of foreign direct investment, most of the policies geared towards the reduction of trade barriers are linked to opening up specific sectors of the economy to investment. An example of such policy is the free zone board of 1995 (Act 504). These areas may not be of interest to foreign direct investors but of keen interest to government officials and government objectives at that moment.

Therefore, a percentage rise in trade openness will result in a 4.58% fall in FDI. This result was contrary to the work of Nyarko (2011) who concluded on trade openness having a positive effect on FDI inflows but confirmed that of Ellahi (2011) who revealed that trade openness has a negative effect on FDI.

The effect of nominal effective exchange rate on FDI inflows is negative and insignificant at 1% significance level. This means that the exchange rate is negatively correlated to FDI but does not play any role in the receipts of FDI in the country in the long run. These results concur with the economic a prior expectation of a negative effect of nominal effective exchange rate on FDI inflows into the Ghanaian economy. As the nominal effective exchange rate increases by 1%, FDI inflows fall by 1.52%. This result is in consonance with the empirical works of Ellahi (2014), Ullah et al. (2012) and Adu et al. (2014) who found that the depreciation of a host country currency decreases FDI but contradicts the empirical studies by Dhakal et al.

(2010), Nagubadi and Zhang (2011), and Chaduhary et al. (2012) who also found out that there is a positive effect of the depreciation of the host country currency on FDI.

In addition to this, the result is indicative of the fact the exchange rate volatility exert a negative effect on FDI inflows in the Ghanaian economy. Hence, as exchange rate volatility increases by 1%, FDI inflows decrease by 0.41%. This shows that, in situations where exchange rate is more stable, FDI increases in the country. On the contrary, volatility of exchange rate reduces FDI inflows; this may be as a result of increase in investment uncertainty when exchange rate is unstable. Finally, holding all other factors constant in the long run, over time, FDI depreciates by 49.59% each year.

4.8 Short Run Results

The study investigated the short run dynamics among the variables of study. This is shown in Table 4.6.

The outcome of the short-run dynamics of Table 4.6 reveals that nominal effective exchange rate has a negative and significant effect on FDI. This means that depreciation of the Ghanaian cedi serves as a deterrent to the attraction of foreign direct investment into the country. A percentage rise in the nominal effective exchange rate will lead to a 0.55% fall in FDI inflows. This means that in the short run, the amount of FDI coming into the country is being limited by the exchange rate level of the country. This result is in consonance with the empirical works of Ellahi (2014), Ullah et al. (2012) and Adu et al. (2014) who found that the depreciation of a host country currency decreases FDI but contradicts the empirical studies by Dhakal et al.

(2010), Nagubadi and Zhang (2011), and Chaduhary et al. (2012) who also found out that there is a positive effect of the depreciation of the host country currency on FDI.

Hence there is the need for the Bank of Ghana to ensure that the level of exchange rate is low in order to attract as many foreign direct investors as possible. More so, inflation and trade openness has an inverse and significant effect on inflows of FDI in the Ghanaian economy. When inflation increases by 1% FDI falls by 0.4%. This means that the rate of inflation in the Ghanaian economy serves as a hindrance in the attraction of FDI into the country. As such its level must be reduced by the central Bank of Ghana in order to allow as many FDI as possible.

Also when trade openness increases by 1%, FDI falls by 1.6%. This means that the opening up of the economy should be well considered. This means that when policies are being implemented to open up the economy to specific sectors, those sectors should as much as possible cover areas which may be of keen interest to foreign direct investors in other to attract them. Furthermore, as seen from Table 4.5, interest rate has positive but not significant effects on FDI. A 1% increase in interest rate leads to 0.17% increase in FDI in the short-run. This means that in the Ghanaian economy, interest rate does not play any role in attracting foreign direct investment in the short term. The long run component of the model is given by the lagged error correction, ECM (-1). From the empirical results the coefficient of the ECM (-1), is negative and significant. It means that the nominal effective exchange rate, exchange rate volatility, inflation, real GDP, interest rate, and trade openness are indeed related to the dependent variable FDI_Level through this error correction term.

A significant ECM (-1) coefficient means that all things being equal, whenever the actual value of DLNFDI_level falls below the value consistent with its long-term equilibrium relationship, changes in the independent variables help bring it up to the long term equilibrium value. The size of the coefficient shows that the speed of adjustment to equilibrium (whenever there is inequality) is about 36%. In other words, 36% deviation in the long term equilibrium is corrected in the long run. This is low speed of adjustment to long run equilibrium. Though the speed of adjustment (error correction term) is low and significant it still confirms the existence of a stable long-run relationship.

Finally, the R-square indicates that 71.1% variation in the levels of FDI is explained by the explanatory variables. The Durbin-Watson statistic of 1.966 which is close to 2, confirms the absence of auto correlation in the estimated model. In addition to this, the F-statistic which is also statistically significant show that the model is overall fit and it indicates a good fit.

Table 4.6: Estimated Short-Run and Error-Correction Results

Variable	**Coefficient**	**Std. Error**	**t-Statistic**
D(LNINFL)	-0.378795*	0.185474	-2.042306
D(LNINT)	0.176731	0.406146	0.435142
D(LNINT(-1))	1.054770**	0.426608	2.472459
D(LNNEEX_RATE)	-0.552847**	0.241181	-2.292247
D(LNERV)	-0.149923	0.133952	-1.119226
D(LNTO)	-1.660903**	0.600516	-2.765793

D(LNGDP)	0.980273	1.340497	0.731276
ECM(-1)	-0.362921**	0.148459	-2.444586
R-Squared	0.711770		
Adjusted R-squared	0.574517		
F-statistic	5.185843		
Prob(F-statistic)	0.000739		
Durbin Watson	1.966941		

Source: Authors own construction
Notes: *** Statistical significance at 1% level; ** Statistical significance at 5% level; * Statistical significance at 10% level.

4.9 Forecast Error Variance Decomposition of the base model

In order to achieve the fourth objective by determining how changes in exchange rate affect FDI. The study decomposed the variance of the change in exchange rate to assess the relative importance or contribution to FDI inflows into the country. The decomposition shows the variations in exchange rate at various time horizons. The result of the decomposition is presented in table 4.7;

Table 4.7: Forecast Error Variance Decomposition of the base model

Variations in FDI explained by		
Horizon	FDI	Exchange Rate
1	.73257	.020048
2	.66984	.047029
3	.63058	.077141
4	.60972	.099428
5	.59211	.11293
6	.57100	.11928
7	.54216	.12019
8	.50818	.11898
9	.47409	.11686

10	.44404	.11536

Source: Author‟s Own Construction

From table 4.7 in the first year, the level exchange rate explains about 0.02% of the variation in FDI. That is changes in exchange rate affect FDI by 0.02% this shows that shocks from exchange rate variation barely affect FDI in the first year. In the second year, the effect of the variations in exchange rate on FDI increases to 0.04% which is still very weak. But FDI is able to explain 66.9% of its own variation. This weak effect of the variations in exchange rate on FDI continues through to the fourth year. However, from the fourth year onward the effect increased with the highest effect taking place in the seventh year. In the seventh year the variations in FDI is explained by 12.01% variation in the level of exchange rate. This value though the highest in the given period is still weak. Hence from the results of the forecast error variance decomposition, the effect of changes in exchange rate on FDI in Ghana is very weak and minimal. Therefore, shocks from Ghana‟s exchange rate have very weak and minimal effect on the amount of foreign direct investment that enters the Ghanaian economy. Nevertheless, the shocks from FDI have a major effect on its own variations. This may be due to the frequent reforms of the country‟s trade policies as well as the restructuring of the economy that is macroeconomic structures, to attract foreign investors into the country.

CHAPTER FIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Summary of findings

The trend analysis reveals that there exists a time trend between the variables of interest. FDI inflows was sluggish in the early 1980s but had significant high inflows from the year 2004 upwards due to the amalgamation of Ashanti Goldfields and AngloGold and the commencement of a US$400m deal by Newmont an American company, but began experiencing a downward trend after 2011. The exchange rate of the cedi to major trading currencies on the other hand, has experience a significant downward trend for almost all the years under study.

From the estimation of the empirical model it could be seen that holding all other things constant, a percentage change in nominal effective exchange rate brings about1.52% decrease in the levels of foreign direct investment in the long run. This indicates that as the cedi depreciates it causes foreign investors to look to other places to invest other than the Ghanaian economy hence a negative relationship between the exchange rate and FDI inflows. However, the effect that exchange rate had on FDI was not significant. This means that the role that exchange rate has in attracting FDI into the economy is not significant in the long run.

Nevertheless, it was observed that in the short-term the effects that exchange rate had on the levels of FDI was negative and significant. Thus the level of exchange rate, whether appreciation or depreciation, significantly influence the behavior of investors, firms, and businesses in their investment decisions in the Ghanaian economy. The study also revealed that inflation, exchange rate volatility and trade openness had negative effects on FDI inflows in the long run.

Nonetheless, the negative effect of fluctuation of exchange rate on FDI inflows was not significant. Again in the long run interest rate had a positive and significant effect on FDI whiles real GDP had a positive but insignificant effect on FDI. These results were similarly revealed in the short run estimates of the empirical model with the exception of interest rate which had a positive but insignificant effect on FDI inflows.

Finally, from the results of the forecast error variance decomposition, the effect of changes in exchange rate on FDI in Ghana is very weak and minimal. Therefore, shocks from Ghana‟s exchange rate have very weak and minimal effect on the amount of foreign direct investment that enters the Ghanaian economy.

5.1 Conclusions of the study

This study sought to develop an empirical model of Foreign Direct Investment and exchange rate in Ghana. Specifically it investigated the effects that exchange rate has on the levels of foreign direct investment in Ghana using yearly time series data from 1980 to 2013. The theories as well as empirical works that characterized foreign direct investment as well as exchange rate were reviewed in this study as well as documented in the literature for both developed and developing economies.

An empirical model was specified which was centered on the review of a wide range of literature on the factors which bring about foreign direct investment. The variables included in foreign direct investment model as having potential effects on it included exchange rate volatility, real GDP, interest rate, inflation, and trade openness.

With the intension to establish the long run and short run effects of exchange rate on FDI in the Ghanaian economy, the ARDL bounds test of cointegration and error correction methodology was preferred to other techniques. In the utilization of this methodology, the study commenced by examining the trends of foreign direct investment as well exchange rate over the years from 1980 to 2013 by plotting a time series graph. This was followed by a summary statistics of the transformed data. The study also employed both the ADF and PP test of stationarity to ascertain the stationarity property of the variables under study. Again, the stability of the model of the study was also tested by CUSUM and CUSUMSQ which is shown in the Appendix. These tests confirmed the long run relationships between the variables and also showed the stability of the coefficients. The study went ahead to examine the long run relationship between the levels of FDI and exchange rate as well as other variables in the model using the bounds test.

After ascertaining the existence of a long run association among the variables, the study proceeded to explore the long run and short run dynamics among variables used in estimation. It finally employed the ECM to determine the speed of adjustment to stability in situations where there is a disturbance in the system in the long run. All test and estimation were conducted using E-views 9.0.

The first objective of the study was to examine the trends in FDI inflows and exchange rate over the period 1980 to 2013. It was discovered that from 1980 to 1992, FDI inflow was sluggish, oscillated from 1993 to 2003 and increased sharply from 2004 to 2009. From 2009 to 2013 there have been fluctuations with a fall in 2013.With the trends in exchange rate, the graph shows an appreciation of the cedi from 1980 to 1982 and then a sharp decline from 1983 to 1984. From 1984 onwards the graph (Figure 4.2) shows that the Ghanaian cedi has been

depreciating consistently over the years. This shows that whiles FDI has been increasing for most part of the years especially after 2004 until it began falling lately, the exchange rate of the cedi in contrast has been depreciating consistently after 1984.

The second and third objective was to determine the short run and long run effects of exchange rate on FDI. The study revealed that, in the long run the exchange rate of the cedi had a negative but insignificant effect on FDI into the Ghanaian economy. This means that exchange rate does not play any role in the receipts of FDI in the country in the long run due government interventions in the long term.

However, in the short run it had a significant and negative effect on FDI. This means that, the level of exchange rate significantly influence the behavior of investors, firms, and businesses in their investment decisions in the Ghanaian economy in the short run. Thus exchange rate plays a major role in the receipts of FDI in the country in the short run. Hence, the behaviour of this variable must be taken into account while establishing and implementing monetary policy and exchange rate policies in the short-term.

Finally, from the fourth objective, the study concludes that shocks from the level of Ghana‟s exchange rate have very weak and minimal effect on the amount of foreign direct investment that enters the Ghanaian economy.

5.2 Recommendations

Taking cognizance of the outcomes from the study, the following policy recommendations are worth noting:

First, from the findings of the study, the negative effect of exchange rate on FDI inflows though not significant in the long run but in the short run means that the high and volatile nature of the exchange rate presents deleterious effects to economic growth and development. This may bring about uncertainty in investors in terms of investing or not investing in the economy. Therefore to accelerate investor confidence, it would be needful for policy makers to develop short run policies that will lead to high FDI inflows in the short run.

Since Ghana is an import dependent country the demand for foreign currency is high compared to the cedi and this brings about the depreciation in the cedi. Therefore to bring about an appreciation of the cedi its demand must increase. The Central Bank of Ghana can achieve this by embarking on contractionary monetary policy in order to reduce money supply in the economy.

As money supply reduces this would bring about an increase in interest rate and hence make domestic interest bearing assets more lucrative. This will cause both local and foreign investors to demand these interest bearing assets which intends brings about an increase in the demand for the cedi. The resultant effect is that all other things being equal there will be an appreciation of the cedi as its demand increases and hence brings about an increase in FDI inflows.

Again, in order to improve the exchange rate stability, the government should implement policies such as import-substitution and export promotion that would reduce importation but rather increase exportation of the country. To achieve this reduction in importation, there is the need to increase production of agriculture commodities that can be supported by national climates so as to reduce the importation of such commodities.

The negative relationship between inflation and FDI inflows shows that, high inflation deters FDI inflows into the Ghanaian economy. Therefore there will be the need for price stability. Monetary authorities such as the bank of Ghana can achieve this by tightening its inflation targeting policy of +/- 8 per cent in order to ensure that the prices of goods and services are relatively stable.

This will guarantee foreign direct investors‟ confidence in their business plan and projection in the economy since prices are relatively stable and hence increase FDI inflows into the country. In addition to this, decreased inflation also shows that the local currency value of investment will not diminish.

Lastly the findings of the study also show that the effect of trade openness on FDI inflows is negative and significant. This shows that as the economy becomes more open in terms of being less restrictive on trade with other countries it will bring about a decrease in FDI inflows. This is not surprising because even though reductions in trade barriers are supposed to promote the attraction of FDIs, most of these policies geared towards the reduction of trade barriers are linked to opening up specific sectors of the economy to investment. These areas may not be of keen interest to foreign direct investors as such it is therefore necessary for the Ghana Investment Promotion Council to welcome policies that will open up the economy to more sectors. For instance the free zone board policy geared towards enhancing FDI inflows can be extended to more sectors of the economy in order to attract foreign direct investors into the economy.

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APPENDICES

APPENDIX 1: ARDL BOUNDS TEST FOR COINTEGRATION AND OLS ESTIMATES

Selected Model: ARDL(1, 1, 2, 0, 0, 0, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNFDI_LEVELS(-1)	0.637079	0.148459	4.291277	0.0003
LNINFL	-0.378795	0.185474	-2.042306	0.0539
LNINFL(-1)	-0.522503	0.174766	-2.989731	0.0070
LNINT	0.176731	0.406146	0.435142	0.6679
LNINT(-1)	1.765696	0.482408	3.660173	0.0015
LNINT(-2)	-1.054770	0.426608	-2.472459	0.0220
LNNEEX_RATE	-0.552847	0.241181	-2.292247	0.0323
LNERV	-0.149923	0.133952	-1.119226	0.2757
LNTO	-1.660903	0.600516	-2.765793	0.0116
LNGDP	0.980273	1.340497	0.731276	0.4727
C	-18.00035	31.92064	-0.563909	0.5788

R-squared	0.979900	Mean dependent var	4.536647
Adjusted R-squared	0.970328	S.D. dependent var	2.234934
S.E. of regression	0.384979	Akaike info criterion	1.195028
Sum squared resid	3.112379	Schwarz criterion	1.698875
Log likelihood	-8.120455	Hannan-Quinn criter.	1.362039
F-statistic	102.3764	Durbin-Watson stat	2.335433
Prob(F-statistic)	0.000000		

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.12	3.23
5%	2.45	3.61

2.5%	2.75	3.99
1%	3.15	4.43

Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNINFL)	-0.470250	0.194850	-2.413390	0.0250
D(LNINT)	-0.022026	0.431004	-0.051104	0.9597
D(LNINT(-1))	1.379203	0.434812	3.171953	0.0046
C	-7.442773	38.00370	-0.195843	0.8466
LNINFL(-1)	-0.805124	0.249057	-3.232688	0.0040
LNINT(-1)	0.608268	0.558679	1.088761	0.2886
LNNEEX_RATE(-1)	-0.414718	0.249649	-1.661206	0.1115
LNERV(-1)	-0.033792	0.142966	-0.236365	0.8154
LNTO(-1)	-0.989064	0.621541	-1.591310	0.1265
LNGDP(-1)	0.519537	1.612596	0.322174	0.7505
LNFDI_LEVELS(-1)	-0.315096	0.188690	-1.669909	0.1098

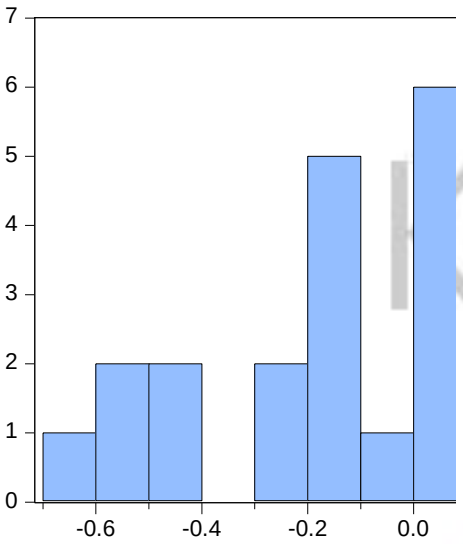
R-squared 0.711770 Mean dependent var 0.165325 Adjusted R-squared 0.574517 S.D. dependent var 0.658990
S.E. of regression 0.429853 Akaike info criterion 1.415539

Sum squared resid	3.880243	Schwarz criterion	1.919386
Log likelihood	-11.64862	Hannan-Quinn criter.	1.582550

APPENDIX 2:Model Diagnostic and Stability test for Estimated model

F-statistic	5.185843	Durbin-Watson stat	1.966941
Prob(F-statistic)	0.000739		

Cointeq = LNFDI_LEVELS - (-2.4835*LNINFL + 2.4459*LNINT -1.5233
*LNNEEX_RATE -0.4131*LNERV -4.5765*LNTO + 2.7011*LNGDP
-49.5985)



Series: Residuals	
Sample 1982 2013	
Observations 32	
Mean	5.33e-15
Median	0.045338
Maximum	0.705346
Minimum	-0.611025
Std. Dev.	0.316859
Skewness	-0.168798
Kurtosis	2.684947
Jarque-Bera	0.284306
Probability	0.867489

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.027116	Prob. F(2,19)	0.3771
Obs*R-squared	3.122195	Prob. Chi-Square(2)	0.2099

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 12/01/15 Time: 13:38
Sample: 1982 2013
Included observations: 32
Presample missing value lagged r
zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFDI_LEVELS(-1)	0.111193	0.167345	0.664452	0.5144
LNINFL	-0.036710	0.190505	-0.192698	0.8492
LNINFL(-1)	0.000432	0.174895	0.002471	0.9981
LNINT	0.058195	0.408216	0.142559	0.8881
LNINT(-1)	-0.010810	0.486223	-0.022233	0.9825
LNINT(-2)	-0.176696	0.443541	-0.398375	0.6948
LNNEEX_RATE	-0.061852	0.245047	-0.252410	0.8034
LNERV	-0.022920	0.134738	-0.170110	0.8667
LNTO	-0.041415	0.604350	-0.068528	0.9461
LNGDP	-0.642531	1.413397	-0.454601	0.6545
C	15.03320	33.60217	0.447388	0.6597
RESID(-1)	-0.417857	0.292845	-1.426887	0.1698
RESID(-2)	-0.182232	0.266764	-0.683118	0.5028

R-squared	0.097569	Mean dependent var	5.33E-15
Adjusted R-squared	-0.472388	S.D. dependent var	0.316859
S.E. of regression	0.384482	Akaike info criterion	1.217366
Sum squared resid	2.808708	Schwarz criterion	1.812821
Log likelihood	-6.477854	Hannan-Quinn criter.	1.414742
F-statistic	0.171186	Durbin-Watson stat	2.016789
Prob(F-statistic)	0.998390		

Ramsey RESET Test
Equation: UNTITLED
Specification: LNFDI_LEVELS LNFDI_LEVELS(-1) LNINFL LNINFL(-1) LNINT LNINT(-1) LNINT(-2) LNNEEX_RATE LNERV LNTO LNGDP C
Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	1.031615	20	0.3146
F-statistic	1.064230	(1, 20)	0.3146

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.157247	1	0.157247
Restricted SSR	3.112379	21	0.148209
Unrestricted SSR	2.955132	20	0.147757

Unrestricted Test Equation:
Dependent Variable: LNFDI_LEVELS
Method: ARDL
Date: 12/01/15 Time: 13:44
Sample: 1982 2013
Included observations: 32
Maximum dependent lags: 2 (Automatic selection Model selection method: Akaike inf(criterion (AIC) Dynamic regressors (2 lags, automatic):
Fixed regressors: C

Variable	Coefficient	Std. Error	t-Statistic	Prob.*

Log likelihood	-7.290950	Hannan-Quinn criter.	1.387878
F-statistic	93.45083	Durbin-Watson stat	2.370210
Prob(F-statistic)	0.000000		

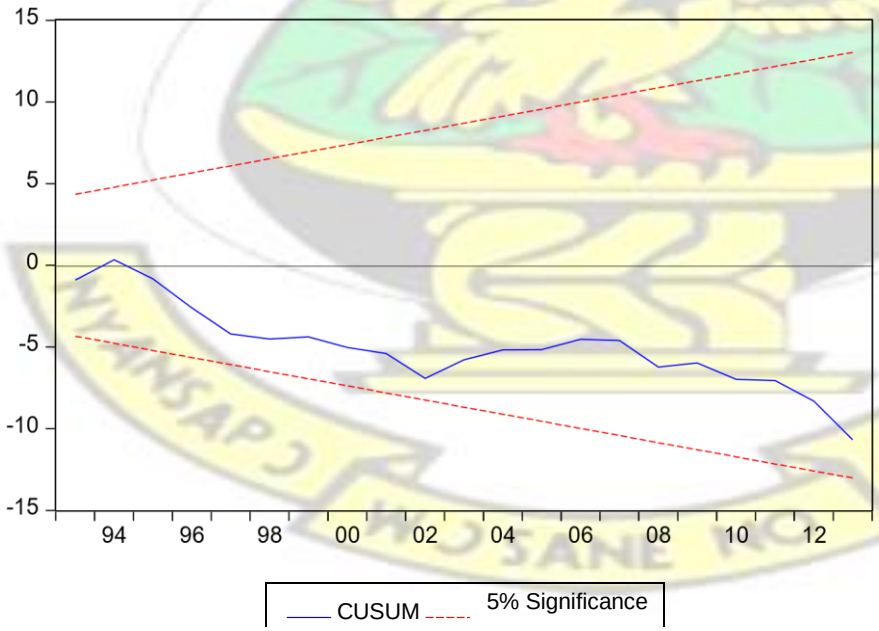
LNFDI_LEVELS(-1)	0.785634	0.206663	3.801521	0.0011
LNINFL	-0.466161	0.203637	-2.289179	0.0331
LNINFL(-1)	-0.598833	0.189538	-3.159437	0.0049
LNINT	0.377352	0.449746	0.839034	0.4114
LNINT(-1)	1.968800	0.520355	3.783571	0.0012
LNINT(-2)	-1.510869	0.613930	-2.460979	0.0231
LNNEEX_RATE	-0.535608	0.241393	-2.218824	0.0382
LNERV	-0.200724	0.142526	-1.408339	0.1744
LNTO	-1.858194	0.629360	-2.952512	0.0079
LNGDP	1.806707	1.559880	1.158235	0.2604
C	-36.44214	36.54304	-0.997239	0.3306
FITTED^2	-0.027857	0.027004	-1.031615	0.3146

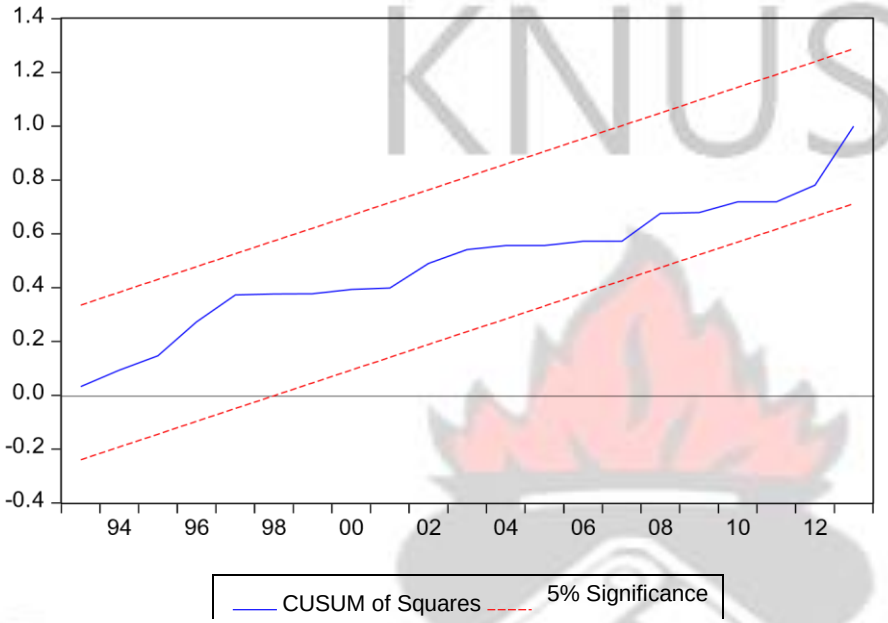
R-squared	0.980915	Mean dependent var	4.536647
Adjusted R-squared	0.970419	S.D. dependent var	2.234934
S.E. of regression	0.384391	Akaike info criterion	1.205684
Sum squared resid	2.955132	Schwarz criterion	1.755335

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

Variance Inflation Factors
Date: 12/01/15 Time: 13:46
Sample: 1980 2013
Included observations: 32

Variable	Coefficient Variance
LNFDI_LEVELS(-1)	0.022040
LNINFL	0.034401
LNINFL(-1)	0.030543
LNINT	0.164955
LNINT(-1)	0.232717
LNINT(-2)	0.181994
LNNEEX_RATE	0.058168
LNERV	0.017943
LNTO	0.360620
LNGDP	1.796933





APPENDIX 3: ADF UNIT ROOT TEST (With only constant and with both constant and trend)

ADF UNIT ROOT TEST

Null Hypothesis: D(LNREEX_RATE) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.862770	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: LNGDP has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		3.047471	1.0000
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	
	10% level	-2.621007	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: LNGDP has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
			0.9957
Augmented Dickey -Fuller test statistic		0.090518	
Test critical values:	1% level	-4.284580	
	5% level	-3.562882	
	10% level	-3.215267	

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

Null Hypothesis: D(LNGDP) has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.727193	0.0007
Test critical values:	1% level	-3.670170	
	5% level	-2.963972	

10% level	-2.621007	

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

Null Hypothesis: LNTO has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.388219	0.5760
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Null Hypothesis: LNTO has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.437311	0.8305
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

Augmented Dickey-Fuller Test Equation
Null Hypothesis: D(LNTO) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.601966	0.0009
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

*MacKinnon (1996) one-sided p-values.
Null Hypothesis: LNINFL has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
		-3.525199	0.0135
Augmented Dickey -Fuller test statistic			
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Null Hypothesis: LNINT has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
		-1.900681	0.3280
Augmented Dickey -Fuller test statistic			
Test critical values:	1% level	-3.646342	
	5% level	-2.954021	
	10% level	-2.615817	

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

Null Hypothesis: LNINT has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.054051	0.5512
Test critical values:	1% level	-4.262735	
	5% level	-3.552973	
	10% level	-3.209642	

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

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

Null Hypothesis: D(LNINT) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.191880	0.0000
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	