KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

THE IMPACT OF FOREIGN DIRECT INVESTMENT ON ECONOMIC GROWTH IN GHANA

A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF

MASTERS OF SCIENCE IN ECONOMICS

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MAY, 2016

DECLARATION

I hereby declare that this research work is part of the requirement toward the attainment of a Master of Science in Economics and that, to the best of my knowledge, it contains no material previously published by another person nor materials which have 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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SUPERVISOR'S DECLARATION

I declare that I have supervised the student in undertaking the study submitted herein and I confirm my permission to present it for assessment.

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DEDICATION

I dedicate this project to the Almighty God for His guidance, directions and wisdom and also to my dear wife, Mrs. Krakraba Millicent and children, Lebene, Dzifa and Bubune.

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ABSTRACT

The issue of economic growth has become a great concern for many economies. The growth of economies has been attributed to many factors. To contribute to this subject, the study empirically investigated the impact of foreign direct investment (FDI) on economic growth using evidence from Ghana. Using time series data spanning from 1980 to 2012, Autoregressive Distributed Lagged model (ARDL) is employed for the study. The study found that there is a significant positive impact of Foreign Direct Investment (FDI) and Gross Domestic Savings (GDS) on economic growth in both short and long run. The study further shows that, inflation significantly impacts negatively on economic growth in the short run but has insignificant negative impact in the long run. Government consumption expenditure significantly impacts positively on economic growth in the short run but has insignificant positive impact in the long run. The results subsequently show that there is unidirectional causality between FDI and economic growth. That is FDI granger causes economic growth in Ghana. Owing to the significant positive impact of FDI on economic growth revealed by the study, policies that seek to attract FDI inflow into the country should be embarked upon to further enhance economic growth of Ghana.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The debate on the impact of Foreign Direct Investment (FDI) especially on economic growth in many countries is not settled and continues to receive attention. Globalization, the increasing role of multinational corporations (MNCs), opening up of economies to international trade and transfer of part of production process from one country to another have increased inflows and outflows of FDI across the world.

Whiles findings from empirical researches have established positive, negative and ambiguous effect of impact of FDI on economic growth using diverse methodologies economic theory generally predicts a positive impact. Many empirical researches including Borensztein, (1995), Alfaro et al., (2006), Wu and Chih-Chiang, (2008), Antwi and Xicang, (2013) and Antwi et al., (2013) have observed a very important role of FDI in growth and development of developing countries especially. Contrary, studies conducted such as Carkovic and Levine (2002); Lyroudi et al. (2004) and Louzi and Abadi (2011) simply could not find any such evidence of a strong linkage between FDI and economic growth. Others have found an ambiguous impact of FDI on relevant macroeconomic variables such as Domestic Investment, Sectoral growth etc (see Alfaro,

2003; Khaliq and Noy, 2007).

Indeed, many economists and policy makers are of the view that FDI creates positive effects in terms productivity for both host and source countries. Technological diffusion, linkages creation between domestic and foreign firms, imitations, employee training, introduction of new production methodologies, and products by MNC‟s are the causes of these externalities. These positive externalities indicates that FDI is very important in economic growth (Alfaro et al., 2006).

In Ghana and many other developing countries, FDI contributes immensely and has been main spur in terms of economic growth and development. This is because FDI has solved two main problems of inadequate technology and skills and financial resources transfer. This has however made FDI an important instrument for many policy makers (Abdulai, 2005). Besides its ability to supplement domestic capital and aiding technological diffusion, FDI also play other major roles in the economy of many countries including but not limited to effects on domestic productivity, output, employment, balance of payment, among others (Alfaro et al., 2006).

Despite these various roles played by FDI in the socio- economic development of many economies, most countries tend to show an ambivalent attitude towards FDI due to perceived negative effects of FDI including negative effect on employment, hindering the growth of domestic industries and deteriorating trade balance. In spite of this ambivalent attitude, many African countries including Ghana tend to view FDI as a way of supplementing their inadequate capital and low technology level and therefore devote a lot of resources both financial and human resource to attracting FDI to their countries.

For example the Ghana investment promotion center (GIPC) was established under the

GIPC Act, 2013 (Act 865) to promote and encourage investments in Ghana. It was also to ensure the creation of attractive incentive framework as well as predictable, transparent, and enabling atmosphere for investments in the country. As a result, FDI inflows have and continue to rise over the past few years. As at 2011, FDI net inflows (Balance of Payment, current US$) in Ghana was $3,222,240,000. For the past 36 years, the figure hovered between $3,222,240,000 in 2011 and $18,260,970 in 1976 (IMF Balance of payment statistics year book 2013). In terms of GDP percentage, FDI net inflow (as percentage of GDP) was 8.22% as at 2011. The highest and lowest values for the past 36 years were 9.52% in 2008 and -0.66% in 1976 respectively.

In spite of the above, documentation of the impact of this high amount of FDI flows in and out of the country has being very minimal over the years. Whiles Frimpong and

Abayie (2006) could not find any causality between growth and FDI from 1970 to 2002 (period of pre SAP and post SAP), other researchers such as Antwi and Xicang (2013); Anokye and Tweneboah (2008); and Sackey et al (2012) found a strong direct link between economic growth and FDI as well as growth of the stock exchange market.

1.2 Statement of problem

Since the 1960s, Ghana has pursued a policy of attracting more foreign direct investment (FDI) to add up to its relatively low capital and technology level. Consequently, Ghana has received and continues to receive high inflow of foreign capital.

Total FDI inflows maintained a steady growth in the 1990‟s and remained at US$3.3 billion from 2011 to 2013. From January to June 2013, Ghana registered 199 new projects valuing GH¢1,099.44 million (US$578.65 million). FDI component of this amount was GH¢1,067.93 million (US$562.07 million). Comparing to the same period in

2012, this shows a decline of 77.70% (GIPC quarterly update, July 2013).

Certainly, Ghana has depended on FDI from the post-independence era till date and this has affected various economy sectors as well as growth and development of the country.

Many studies have investigated the impact of FDI on economic growth. For example, Lyroudi et al, (2004) in United State, Khaliq and Noy, (2007) in Indonesia, Louzi and Abadi, (2011) in Jordan, Maji and Odoba, (2011) in Nigeria and Melnyk et al., (2014) developing countries like Bulgaria, Hungary, Slovenia, Rusia and Ukraine also studied the effect of FDI on economic growth. Nevertheless, results from these studies are inconclusive. For example, Ewe, (2001); Vo and Batten, (2006); Khaliq and Noy, (2007);

Maji and Odoba, (2011); Tintin, (2012); Melnyk et al, (2014) found a direct impact of FDI on economic growth. Contrary, Alfaro, (2003); Adewumi, (2006); Louzi and Abadi, (2011); Djurovic, (2012) and Brenner, (2014) established a negative and ambiguous impact of FDI on economic growth.

It can therefore be construed that there have been some works done but the results from these studies on the effect of FDI on economic growth are varying and inconclusive. It apparently indicates that there is a need for a further study on the effect of FDI and economic growth to ascertain the impact in the case of Ghana and this is what this study seeks to fulfill.

1.3 Objectives of the Study

The principal objective of this thesis is to analyze the impact of foreign direct investment on economic growth in Ghana.

In achieving the main objective, the study also aims to

i. Analyse FDI inflows pattern in Ghana.
ii. Determine short and long run effects of FDI inflows on economic growth.
iii. Determine the causality between FDI and economic growth.

1.4 Research Hypothesis

Based on the main research objective stated above, this study will test empirically the following hypothesis.

$H_o =$ 1. There is no causal link between FDI and economic growth in Ghana.

$H_1 =$ There is a causal link between FDI and economic growth in Ghana.

2. $H_o =$ FDI Inflows exert no significant impact on economic growth in Ghana.

$H_1 =$ FDI Inflows exert significant impact on Economic growth in Ghana.

1.5 Significance of the Study

The study is essential in the sense that economic growth of Ghana in relation to FDI inflows cannot be underestimated. Being a country that has devoted a lot of resources both financial and human resources to attracting FDI in to the country over the past few years, it is beneficial to both governments and policy makers to know the real impact of the FDI being encouraged on economic growth in Ghana. This study therefore provides this very important information to the various stakeholders involved in managing the affairs of the country.

1.6 Scope and delimitation

Many macroeconomic variables including inflation, domestic investment, government expenditure and domestic savings impact on economic growth of Ghana but for the purpose of the study the variable FDI and its impacts on economic growth is considered while the other equally important variables are not looked at in this study. The reason for considering the FDI is due to the fact that, FDI keep on flowing into the country due to the measures such as Free Zone Board (FZB) put in place by the government over the years to attract FDI into the country. The study relies on time series annual data from

1980 to 2012.

1.7 Organization of the study

The thesis consists of five chapters. Chapter One is the introduction and comprises the background, study objectives, research questions, statement of problem, study justification, the scope and the organization of the study. Chapter Two cover the review of both

theoretical and empirical literature. Chapter Three is the methodology and deals with the development of theoretical models and methodologies that are used for the data analysis. The models that are used for the study are also identified and discussed.

Chapter Four also focuses on the data analysis, while the final chapter focuses on the summary of major findings, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter reviews relevant literature. This chapter consists of three parts. The first part contains the review of relevant theoretical literature that forms the basis of the study, the second part deals with the review of relevant past and present empirical literature on the impact of FDI on economic growth and the last part deals with conclusion on the review.

2.1 Theoretical Review

There is no consensus in literature concerning how and to what degree does FDI affects economic growth in many countries. Whiles economic theories used to explain FDI and its determinants usually predict a positive relationship between FDI and economic growth, empirical findings on the topic tend to produce rather ambiguous results. Renewed interest in determinants of growth with the introduction of theories of endogenous growth has however mitigated the ambiguity in the literature by emphasizing on FDI as one of the long run growth determinants.

With accumulation of capital as well as introduction of new foreign technologies and inputs into the production activities in host countries FDI has been envisaged to impact positively

on growth. Several attempts to explain how FDI affects growth have taken inspiration from growth theories. Theory of neoclassical growth, theory of endogenous growth and Harrod-Domar growth model are some of the theories that have been used to explain the phenomenon.

The Solow growth model following Solow (1956) and Swan (1956) is the beginning point for most growth analyses of economies. Other growth models are even better comprehended when compared with Solow model which though move away from Solow model fundamentally.

The Solow model assumes a neoclassical production function which predicts that, an economy‟s output level and growth is a function dependent on the quantity of capital (K), labour (L) and knowledge as well as labour effectiveness (A). These inputs considered in

Solow model are put together to produce output through a function of the form Y(t) = F [K(t), A(t), L(t)], where „Y‟ is output and „t‟ represents time which enters the function indirectly through capital, labour and technology (Romer, 2012).

Solow model forecast that, countries that start with lower level of GDP per capita as a result of lower aggregate capital level in relation position of steady state tend to grow faster assuming a constant returns to scale, positive and smooth substitution elasticity between inputs, diminishing returns to each input and constant and exogenous savings rate. In other words, economies with small capital per worker in relation to long-run capital per worker

are likely to experience growth rate and returns (Salai- i- Martin, 2004; Salai-i-Martin and Barro, 1995).

Since FDI involves the direct inflow of capital including physical capital into the host country which tends to add up to the existing aggregate capital stock of the host country, FDI is assumed to enter the production function through the capital stock (K) and thus promoting economic growth of recipient country.

The assumptions of diminishing returns to capital and prediction of the neoclassical model that, growth is due to exogenous factors including population growth, constant savings rate and technological progress, makes the standard neoclassical growth model theoretically inefficient in exploring the determinants of long-run growth (Salai- i- Martin, 2004). This inefficiency however led to the arrival of endogenous growth model which mainly predict that, growth is due to endogenous factors. Endogenous growth theory has the view that endogenous forces being the main cause of economic growth rather than external forces hence long term growth is the result of technological progress. Borensztein et al, (1995) argued that the technological progress as advocated by the endogenous growth theorist occurs through the capital deepening process in the form of new capital goods introduction. FDI therefore enters the theory by providing new varieties of capital. Models under the endogenous growth models include the AK model and the Romer model.

Emphasizing on human capital importance and technological improvements in growth process, and the fact that, not only physical capital but technology and skill transfers are involved in FDI, the theory implicitly predicts a positive impact of FDI on economic growth especially in developing countries which has lower levels of human capital as well as aggregate capital.

Harrod-Domar model has also been used to explain the growth of an economy. The model which was developed by Harrod (1939) and Domar (1946) combines the Keynesians and the Classical growth theories. The model explains the efficacy and role of investment in economic growth of countries (Maji and Odoba, 2011). The model shows the required investment level that is needed to achieve a certain level of output growth in an economy.

The Harrod-Domar model is specified as; $\frac{\Delta Y}{Y} = g = \frac{s}{k}$ .....(2.1)

Where, g, s and k denote growth rate of national output, saving ratio and 5 capital-output ratio. The model postulates that if saving (s) level is high, firms can borrow more for investment and hence more investment. Increase investment generates an increase in output which leads to economic growth. Again, if the capital output ratio (k) falls, the economy will be able to produce more with fewer inputs as a result of the economy being more productive and this will enhance economic growth.

The implication of the Harrod-Domar model is that, if developing countries want to achieve economic growth then there is a need for the government to promote savings (s)

k and also encourages technological advancement to reduce the capital output ratio, $\frac{k}{y}$.

Technology transfer from developed countries to developing countries is also a form of FDI. From the above, it can be deduced that FDI in the form of technological advancement can lead to economic growth and so government can really encourage technological transfer if economic growth is to be achieved. For this reason, economic growth can be specified as a function of FDI; $Economic\ \ Growth = f(FDI)$.

Recent models of technological diffusion can also be used to explain theoretically the importance of FDI to growth. Technological diffusion theory seek out to elucidate how, why, and at what rate do new technologies and ideas spread through cultures, societies, firms and nations as a whole. Most discussions of technology diffusion focused mainly on the slow speed at which firms adopt new technologies and how such slow response are likely to affect growth of such firms as well as the economy‟s growth in general (see Geroski 2000; Blackman 1999).

Most of these technologies are developed by the most advanced technological countries and large Multi National Companies (MNCs) who are more capable of undertaken Research

and Development (R & D). Developing countries and developed countries in some cases therefore benefit from these technological innovations trough FDI by these

MNCs which results in technological diffusion which finally leads to economic growth. However, according to Borensztein et al., (1995), technological diffusion sometimes takes time to take place resulting in differences in growth of firms and countries. Thus, growth in these countries can be explained in part by these catch up process in the level of technology.

Widely accepted theories of technological diffusion models as observed by Karshenas and Stoneman (1993), includes five categories: (i) epidemic models which is the oldest of diffusion models and based on the premise that, prospective adopters would gain new technology upon obtaining information relating to its existence, (ii) rank models which is based on the assumption that potential adopters of a technology have different intrinsic characteristics (such as firm size) and in turn acquire different (gross) returns from the new technology usage which then generate different preferred adoption dates (iii) order models which is based on the assumption that firms‟ return from adopting new technology depends on its position with respect to the adoption order. High-order adopters turn to achieve greater returns compared to low-order adopters, (iv) stock models based on the assumption that marginal adopters‟ benefit from acquisition decreases with increasing number of previous adopters and (v) probit models which is based on the premise that, all consumers with exception of innovators, the pressure to adopt a new technology increases with number of other adopters.

2.2 Empirical Review

This section deals with the review of relevant empirical studies on the effect of FDI on economic growth and is organized into two sections; the studies that find positive impact and those that find negative or ambiguous effect of FDI on economic growth.

2.2.1 Studies that find a positive impact of FDI on economic growth

Some empirical findings on impact of FDI on economic growth have been asserted to be positive as posited by economic theories.

Melnyk et al., (2014) in their pursuit to find out the effect of FDI on economic growth in 26 developing and transition economies such as Ukraine, Russia, Slovenia, Bulgania etc. Employing panel ordinary least square fixed effects technique for a period of 1998-2010, they established that FDI impacts positively on economic growth considering the selected countries.

Djurovic (2012) undertook a study to investigate the impact of FDI on economic growth in developing economies. Ordinary least square and deductive logic techniques were employed for the analysis for the period of 2000-2010. She reported an independent positive relationship between FDI and economic growth. She added that, FDI impacts positively on economic growth when combined with higher government spending.

Tintin (2012) in finding out the effect of FDI on economic growth conducted a study in 125 countries; 38 developed, 29 least developed and 58 developing countries. Employing panel

ordinary least square and using data from 1980-2010, the results show a positive impact of FDI on economic growth in the selected developed, developing and least developed countries.

Majid and Odoba (2011) in their pursuit to find out the effect of FDI on economic growth in Nigeria from 1986-2006 employed ordinary least square technique for their analysis.

They concluded that FDI impact positively on Nigerian economy.

Louzi and Abadi (2011) in their study in Jordan established a positive effect of FDI on economic growth. Using annual time series data from 1990-2009 and employing OLS and VAR techniques, they reported a dependent positive impact of FDI on economic growth. That is, the impact is realized when it is combined with other factors like high human capital level, political stability and good developed infrastructure facilities.

Adewumi (2006) also investigated the phenomenon in 11 countries. Positive impact of FDI on economic growth was reported employing OLS technique and using annual time series data from 1970-2003. However, it was insignificant.

Vo and Batten (2006) in their pursuit to find out the impact of FDI on economic growth in 79 countries from 1980-2003 employing panel data techniques; fixed and dynamic methods. They established that FDI has a positive but dependent impact on economic growth. The results further show that the combination of FDI and education generate positive economic growth.

Borensztein et al. (1995) analyzed the effect of FDI on economic growth within the context of a cross country regression framework. FDI inflows data from 69 developing countries for the period of 1970 to 1989 was used. Positive and significant relationship between FDI and economic growth was established. They further observed that FDI contributes much to economic growth compared to domestic investment due to transfer of technology.

De Mello (1999) findings also agree with theories which posit positive impact of FDI on economic growth. He further observed that, though FDI is anticipated to boost host country economic growth in the long run through technological diffusion and knowledge spill overs, this can only occur or depends on the extent of complementarity and substitution between domestic investment and FDI. Annual time series and panel data from 1970 to 1990 from sampled OECE and non OECD countries was used.

Berthélemy and Démurger (2000) also studied the impact of FDI on economic growth in China. General Method of Moments (GMM) simultaneous equation estimation model was used. Using 24 Chinese provinces for the period 1985-1996, positive relationship between FDI and economic growth was found and continued that the foreign technology transfer is a major determinants of growth of economies which further leads to more FDI inflows.

Bengoa and Sanchez-Robles (2003) also investigated the relationship between FDI and economic growth for a group of 18 Latin American countries. Panel fixed and random effect

methodology was employed. Using data from 1970 to 1999, positive impact of FDI on economic growth in the host country was established. They added that economic freedom also generates FDI inflows. Economic stability, liberalized markets and adequate human capital are required in host countries in order to have long run capital flows benefits.

Hermes and Lensink (2003) conducted a study to find out the role of financial development in enhancing the theoretically believed direct link between FDI and economic growth. Using data from 67 LDC‟s mostly in Latin America, Asia and South Saharan Africa for the period 1970- 1995, they observed a positive relationship between

FDI and growth in more financially developed market economies. They further observed that, 37 out of the 67 countries have a more developed financial market and they equally experience a positive impact of FDI on economic growth. However, the remaining economies with weak financial markets did not experience positive impact of FDI.

Alfaro et al, (2006) did an inspiring study on the effect of FDI in economic growth. Methodology that emphasize on the importance of local financial market in FDI flows was used. They modelled their work on the assumption of a small economy which is open and the final goods production is carried out by both foreign and domestic firms which compete for both unskilled and skilled labour as well as intermediate goods.

Their results show that, higher growth rate are associated with economies that are financially well developed compared to economies that are not financially well developed. Again, FDI share increase generates more growth in financially well developed countries than countries which are financially under-developed given the extent of foreign presence.

Their study further brought to light the role of domestic conditions including human capital, market structure, and absorptive capacities for a more significant effect of FDI on economic growth.

Koojaroenprasit (2012) used annual time series data from 1980 to 2009 and OLS methodology within a multiple regression framework and observed that, FDI has statistically positive significant effect on economic growth of South Korean. It was observed that employment, export and human capital have positive and significant impact on South Korean growth while domestic investment was found to have no significant impact. He further observes from the results of the study that, the effect of FDI on growth when interacted with export and also human capital given technology and knowledge is a negative one.

2.2.2 Studies that find negative or ambiguous impact of FDI on economic growth

Empirical findings on the effect of FDI on economic growth tend to present rather ambiguous results. Most empirical literature finds frail support for the importance of FDI in growth whiles Micro literature that focused on either firm level studies or country specific studies tend to produce ambiguous results.

Brenner (2014) in his study reported a mix result of the effect of FDI on economic growth. The research was conducted in 112 less and more developed countries excluding oil exporting countries for the period of 1974-2010. Using General Method of Moment

technique he established positive impact of FDI on economic growth in more developed countries compared to negative impact in less developed countries.

Noormamode (2008) reported an ambiguous effect of FDI on economic growth. Vector Autoregressive Regression technique was employed for the study in 58 countries and annual time series data from 1980-2004. She established that the inflow of FDI do not necessarily enhance economic growth and further added that there is uncertainty concerning the impact of FDI on economic growth.

Ciftcioglu et al. (2004) also established a mixed result in their study. They employed panel ordinary least square fixed effects and pooled classical regression technique using nine central and east European countries for the period 1995-2003. They further reported that FDI impacts positively on share of export in GDP, negatively on economic growth, unemployment and the share of manufacturing and agriculture in GDP.

Konings (2001) uses panel data from firms‟ level to find out the impacts of FDI on performance of productivity in local firms in 3 emerging economies namely Poland, Romania and Bulgaria. Using data for the period 1993-1997 and the GMM methodology, he finds no evidence of positive spill overs of FDI on domestic firms. He further observes that, FDI have negative spill over effects on domestic firms in Bulgaria and Romania but no spill over effects on domestic firms in Poland.

Carkovic and Levine (2002; 2005) did an inspiring work on importance of FDI in accelerating economic growth. Using panel data from 72 countries including Ghana as well as the Generalized Moment Method (GMM) panel estimator they observe that, FDI inflows exert a dependent effect on growth which is contrary to theory. These results were based on a cross country data from 1960-1995.

Alfaro (2003) also observes a result that goes contrary to theoretical prediction of positive relationship between FDI and economic growth. System of GMM equations on a cross sectional data from 47 countries was used and covering the period from 1981-1999, he observes that, there is an ambiguous effect of FDI on growth. Further on sectoral level, it was revealed that FDI impact negatively on growth in the primary sector, while there was a positive and ambiguous impact on manufacturing and service sectors growth respectively.

Lyroudi et al., (2004) on their part also investigated the effect of FDI in transition economies such as Russia, Ukraine, Latvia and Albania. Using the Bayesian estimation technique on data from 17 transition economies for the period 1995 -1998, they observe no significant link between FDI economic growth. They further obtained same result when the data was split into high income and low income countries.

Khaliq and Noy (2007) also observed result that questions the proposition of the FDI led growth hypothesis. Sectoral annual FDI flows data for the period 1997-2006 within the context of a panel fixed effects methodology was used to analyze the effect of FDI on

growth. It was found that there is a significant positive effect of FDI on economic growth on aggregate level. On sectoral level, it was observed to be varied with FDI having a negative effect on growth in manufacturing sector in Indonesia.

Lund (2010) also did an investigation on the relationship between FDI and growth using panel data from selected countries in Latin America and East Asia for the period 19802003. An ambiguous link was found between economic growth and FDI in both developing and developed countries. Focusing on the causal relationship between economic growth and FDI and using Pedroni Tests which is a Test of Panel Co-

integration and also conducting a unit root test, he find out that, there is much proof of a GDP to FDI causal relationship in the long run in most countries whiles evidence of a short run FDI to GDP relationship exist especially in higher income countries.

2.2.3 Empirical review on Ghana

Andinuur (2013) in his pursuit to investigate the effect of FDI on economic growth in Ghana used annual time series data from 1980 – 2011. Ordinary least squares and Vector Autoregressive regression techniques were employed for the analysis. The result shows that there is a positive impact of FDI on economic growth.

Asafu-Adjaye (2005) conducted a study in Ghana to establish the relationship between economic growth and FDI. Employing ordinary least square technique and using annual time series data spanning from 1973 to 2003, he established that there is a positive effect of FDI on economic growth.

2.3 Conclusion

Studies that investigated the impact of FDI on economic growth have been re-examined under this sections. Based on the empirical review above, it can be deduced that indeed some studies have been conducted for the period ranging from 1960 – 2011. These studies have been conducted in developing countries, least developed countries as well as developed countries. The results of these studies are however not conclusive and owing to the role of FDI as well as the effect on economic growth, there is the need for further investigation.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter consists of the econometric methods that are employed to achieve the objectives. Specifically, it consists of the model specification, the data source and type and the techniques for estimation.

3.1 Model specification

The study adopts the Harrod-Domar growth model which posits that, an economy‟s growth rate depends on capital output ratio as well as savings. The model is specified as:

$$\frac{\Delta Y}{Y} = k^{s} = g = f\left(k^{s}\right) \quad \text{.....(3.1)}$$

Where g represents growth of national output, s represents the savings ratio and k represents the capital output ratio. From the model specified in equation3.1, it is clear that savings has a positive (direct) relationship with growth. According to the Keynesian (1936) S=I, where S and I denote Savings and I investment respectively. This condition holds under the assumption that no portion of savings is consumed and hence all savings made are invested. For the purposes of this study and in the context of the Ghanaian economy, since FDI is a type of investment, the model can be re-specified as follows:

$$g = f(FDI) \quad \text{.....(3.2)}$$

Again, following empirical and theoretical review, and also Carkovic and Levine (2002) the study includes some control variables (Inflation and government expenditure) to generate a baseline line model as shown below;

$$g = F(FDI, INF, GE, GDS) \quad \text{.....(3.3)}$$

where g represents growth, FDI represents foreign direct investment, INF represents inflation, GE represents government expenditure and GDS represents gross domestic savings.

The model is further transformed in an econometric form as shown below: $\ln g = \alpha_0 + \alpha_1 \ln FDI + \alpha_2 \ln INF + \alpha_3 \ln GE + \alpha_4 \ln GDS + \varepsilon_t$ .....(3.4) where α_i, α, t and

ln represent the parameter estimates, disturbance term, time trend and the natural logarithms. Variables in the model are as already defined and are expressed in log form.

The use of logarithms in the model is significant due to a number of reasons including i) it helps all variables to be measured in the same unit; ii) it helps in reducing econometric problems of heteroskedasticity and autocorrelation in the residuals; iii) taking the natural log of the variables is significant because most time series data are characterized by inherent growth rates which may be constant or varying and not integrated as well, hence no matter the amount of differencing will make it stationary if not transformed and iv) series with no linear trend are turned to linear trend when transformed into logarithm

(Gujarati, 2004 and Asteriou and Hall, 2011).

3.2 Variable description and the expected signs

This section describes the dependent and independents variables.

3.2.1 Economic Growth

The GDP of every economy is simply the total volume of all goods and services produced over specified period of time. GDP is used as a measure of economic growth in this thesis and it is measured in per capita terms. Some studies which investigated the effect of FDI on economic growth have measured economic growth in per capita terms (See Djurovic, 2011, Alfaro, 2003 and Carkovic and Levine 2002). In relation to this thesis, GDP (economic growth) is the dependent variable.

3.2.2 Foreign Direct Investment (FDI)

FDI is the long term involvement of a source country‟s management, joint venture, transfer of technology and expertise in a particular host country. In other words, it refers to the situation whereby individual of a particular country, (source country) obtained ownership of investment in another country (host country) for production control and distribution purposes and other related activities of a firm(s) found in the host country. In this study, FDI is calculated as the net FDI inflows as a percentage of GDP. Studies conducted by Brenner, 2014, Alfaro, 2003 and Carkovic and Levine, 2002 measured FDI as percentage of GDP. Since FDI is envisaged as investment theoretically and considering the trend of inflow into the country over the years which show an increasing trend, the impact on economic growth is expected to be positive. That is, β_1 is expected to be positive.

3.2.3 Inflation

This is the persistent and continuous rise in general price level of goods and services over specified period of time. For this study consumer price index (CPI) is considered for inflation. Studies conducted by Andinuur, 2013, Alfaro, 2003 and Carkovic and Levine, 2002 have measured inflation in terms of CPI. In theory, when there is a rise in price levels, it causes the purchasing power of consumers to decline hence causing domestic production to reduce resulting in negative effect on GDP. Therefore the sign of β_2 is expected to be negative.

3.2.4 Government Expenditure

Government expenditure is simply the spending made on all government transfer payments, investment and consumption. In this study, government expenditure is measured as a

percentage of per capita GDP. Investigation carried out by Djurovic, 2011, Alfaro, 2003 and Carkovic and Levine, 2002 measured government expenditure as percentage of GDP. Following, the Keynesian closed economy theory $Y = C + I + G$, where Y is total output (economic growth), C, I and G denote consumption expenditure, investment government expenditure. It is deduced that government expenditure has a direct relationship with economic growth. Therefore the sign of β_3 is expected to be positive.

3.2.5 Gross Domestic Savings

Gross domestic savings is the savings made domestically. For the purpose of the study, gross domestic savings is measured as a percentage of GDP. The study carried out by Djurovic, 2011, Alfaro, 2003 and Carkovic and Levine, 2002 measured gross domestic savings as percentage of GDP. Following, the Harrod-Domar growth model, savings has a direct relationship with economic growth, hence the sign of β_4 is expected to be positive.

3.3 Type and sources of data

Annual time-series data spanning from a period of 1980 to 2012 will be employed. All data for the variables were obtained from World Bank‟s World Development Indicators (WDI) with the exception of FDI data which was sourced from UNTACD data statistics.

3.4 Estimation Strategy

This section presents the various estimation techniques employed for the study to achieve the set objectives. Basically, it consists of i) Stationarity (Unit Root) test of the individual variables to check the order of integration ii) Cointegration testing to check for an equilibrium long-run relationship and iii) estimation of the parameters in the model.

3.4.1 Stationarity Test (Unit Root test)

This study conducts a stationarity test of the series in each variable to avoid spurious estimates considering that, the study follows recent econometric literature of time series analysis. It is however imperative to conduct stationarity test to determine the integration order to enable the selection of an appropriate estimator. For the purposes of this study, Augmented-Dickey Fuller (ADF) test and Phillip-Perron (PP) test are employed. The use of these two tests is to ensure consistency in the variables.

3.4.1.1 Augmented Dickey Fuller (ADF) Test

Dickey and Fuller (1979) proposed the ADF to determine the time-series properties of variables that are included in models. ADF test helped to establish the integration order among the variables used in the model to prevent any spurious results. The ADF test is represented in the form:

$$\Delta Y_t = \alpha_o + \alpha_1 Y_{t-1} + \sum_{r=1}^{j} \beta_r \Delta Y_{t-1} + \varepsilon_t \quad \text{.....(3.5)}$$

Where, Y denotes the variable whose series are investigated and t, Δ, j, and ε denotes time trend, difference operator, optimal lag-length and error term.

The null hypothesis of nonstationarity is tested against the alternative hypothesis that the particular variable being tested is either stationary or nonstationary. The rejection of null hypothesis implies that the particular series is stationary. Contrary, accepting the null hypothesis implies that the series of that particular variable are nonstationary.

3.4.1.2 Phillip-Perron (PP) test

A generalized form of the ADF test is the PP test. This test was developed to cater for the problems associated with the use of ADF test. While in the ADF test, one has to be sure the residuals are not correlated and they have a constant variance, the PP test allows for fairly mild assumptions in the distribution of the residuals. The PP-test also aids to check and correct the presence of econometric problems of Heteroskedasticity and serial correlation in the residuals. Hence, PP test is a modification of the ADF test to avoid spurious results. The specification of the PP test model is shown below:

$Y_t = Y_{t-1} + \varepsilon_t$ .....(3.6)

In the PP test, one needs not specify the length of lag as it already taken care of. Just like the ADF test, the null hypothesis of nonstationarity is tested as against an alternative hypothesis in the PP test. The non acceptance of the null hypothesis implies stationarity amongst a particular series been tested. An acceptance of the null hypothesis also means there is nonstationarity in the series.

3.4.2 Cointegration Test

Co-integration test is used to confirm the existence of common trend stable long-run link between the variables. Hence if there is no co-integration among a group of series, it will result in wrong estimates of the results thereby resulting in spurious estimate. On the other hand, if long-run equilibrium relationship exists between the variables, then there is a high tendency of producing good estimates from the analysis. Again, even though the series may rise as a result of the trends amongst them, because they are cointegrated, a common trend links them together. Auto-Regressive Distributed Lag (ARDL) Bounds test approach was employed for the study.

This econometric technique was selected due to several reasons including; i) this technique provides unbiased estimate of the long-run as well as valid t-statistics though some independent variables used may be endogenous; ii) despite the integration order of zero, one or mixture of zero and one that the variables may exhibit, ARDL model provides estimated coefficients for the long-run relationship and iii) it is very efficient in small sample cases. A formulation of the ARDL framework is shown below:

$$\Delta Q_t = \alpha_o + \alpha_{1t} + \alpha_2 q_{t-1} + \alpha_3 X_{t-1} + \sum_{t=1}^{j} \alpha_5 \Delta q_{t-1} + \sum_{t=1}^{j} \alpha_i \Delta P_{t-i} + \alpha_t \quad \text{.....(3.7)}$$

Where Q represents the dependent variable, P represents the vector of regressors and t represents the time trend for the sample period.

3.4.3 Error Correction Model (ECM)

After testing for the long-run equilibrium relationship existence among the variables, the test for the short-run dynamic parameters using ECM is the next. ECM aids reconcile the short-run and long-run behaviour of the economic variables incorporated in the model. Again, ECM includes the error-correction term in the independent variables in the estimation procedure in order to recover all the long-run information missing in the original estimation process.

An error correction model in its generalized form is formulated below:

$$\Delta Q_t = \alpha_o + \sum_{t=1}^{k} \beta_1 \Delta Q_{t-i} + \sum_{i=0}^{k} \beta_{2i} \Delta P_{t-i} + \ldots + \lambda ECM_{t-1} + \varepsilon_t \quad \ldots\ldots(3.8)$$

Where λ represents speed of adjustment and ECM represent the residual that is estimated from the estimated co-integration model of equation.

3.4.4 Granger Causality

In order to determine the causal relationship between economic growth (GDP) and foreign direct investment (FDI), the study employed pairwise granger causality text by

Granger (1969) which is relatively simple and widely used vector autoregressive (VAR) model application method that defines causality. The Granger causality test presents the effect of the past values of one variable on the current values of another variable. Specifically, it refers to the effect of past value of economic growth (Y_t) on the current values of foreign direct investment (X_t) and in the same vain the effect of the past values of

foreign direct investment (X_t) on the current values of economic growth (Y_t), all other things being equal. In the presence of cointegration vector, in other to conduct a Granger causality test, VAR model is formulated as follows;

$$\Delta Y_t = \beta_0 + \sum_{t=1}^{p} \beta_1 \Delta X_{t-1} + \sum_{j=1}^{q} \beta_{2i} \Delta Y_{t-1} + \varepsilon_t \quad \text{.....(3.9)}$$

$$\Delta X_t = \beta_0 + \sum_{t=1}^{p} \beta_1 \Delta X_{t-1} + \sum_{j=1}^{q} \beta_{2i} \Delta Y_{t-1} + \varepsilon_t \quad \text{.....(3.10)}$$

where Y_t represents GDP, X_t represents FDI (which are all integrated of order one from the unit root test), p and q are the optimal lag length, represents the time trend and

and represent the error terms.

The following procedures are involved in the Granger causality test. Equation 3.9 and 3.10 are estimated and the coefficients significance are checked. Then deletion test is applied, first in the X lagged terms in equation 3.9 and later the lagged terms in equation 3.10. The results provided by the deletion test helps to come up with a conclusion. Again, in the Granger causality test regression equation above, X does not Granger cause Y, when the lagged differenced parameters of X in equation 3.9 are not statistically different from zero and Y does not Granger cause X, when the lagged differenced parameters of Y in equation 3.10 are not different from zero statistically. These therefore form the null hypothesis:

$H_o : \beta_{21} = \beta_{22} = \beta_{23} = \ldots = \beta_{2q} = 0$, X, does not Granger cause Y.

This implies any of the explanatory variables does not Granger cause GDP.

$H_o : \alpha_{21} = \alpha_{22} = \alpha_{23} = \ldots = \alpha_{2q} = 0$, Y does not Granger cause X

This means that GDP does not Granger cause any of the independent variables.

The results from the test are interpreted as follows: i) rejection of null hypothesis in both cases implies that X Granger causes Y and Y Granger causes X, indicating bidirectional causality; ii) accepting null hypothesis in both cases implies that X does not Granger cause Y likewise Y does not also Granger causes X, hence no causality among the variables; iii) if the first hypothesis is rejected but the second hypothesis is accepted it implies that X Granger causes Y and not vice versa, hence there is unidirectional causality from X to Y; and iv) accepting first hypothesis and rejecting the second hypothesis also implies that there is unidirectional causality from Y to X.

3.4.5 Stability Test

In order to check if the estimation regression equations are stable within the specified sample period (1980 to 2012), a stability test is performed. The study test for autocorrelation and heteroscekdasticity using the Breusch-Godfrey Serial correlation LM test and the Breusch-Pagan-Godfrey test respectively. In both tests the null hypothesis of non-existence of autocorrelation (heteroscekdasticity) is tested against the alternative hypothesis of existence of autocorrelation (heteroscekdasticity). If the probability value shows statistical insignificance with reference to the computed F-statistics then the null hypothesis is accepted and a conclusion can be drawn that there is no autocorrelation

(heteroscekdasticity) in the model. Alternatively, if the probability value shows statistical significance with respect to the computed F-statistics the null hypothesis is rejected and a conclusion is drawn that there exists autocorrelation (heteroscekdasticity) In the model. The study further conducts a Jarcque-Bera test to ascertain the distribution properties of the variables included in the model. That is, to check whether the variables are normally distributed or not.

CHAPTER FOUR

DATA PRESENTATION AND DATA ANALYSIS

4.0 Introduction

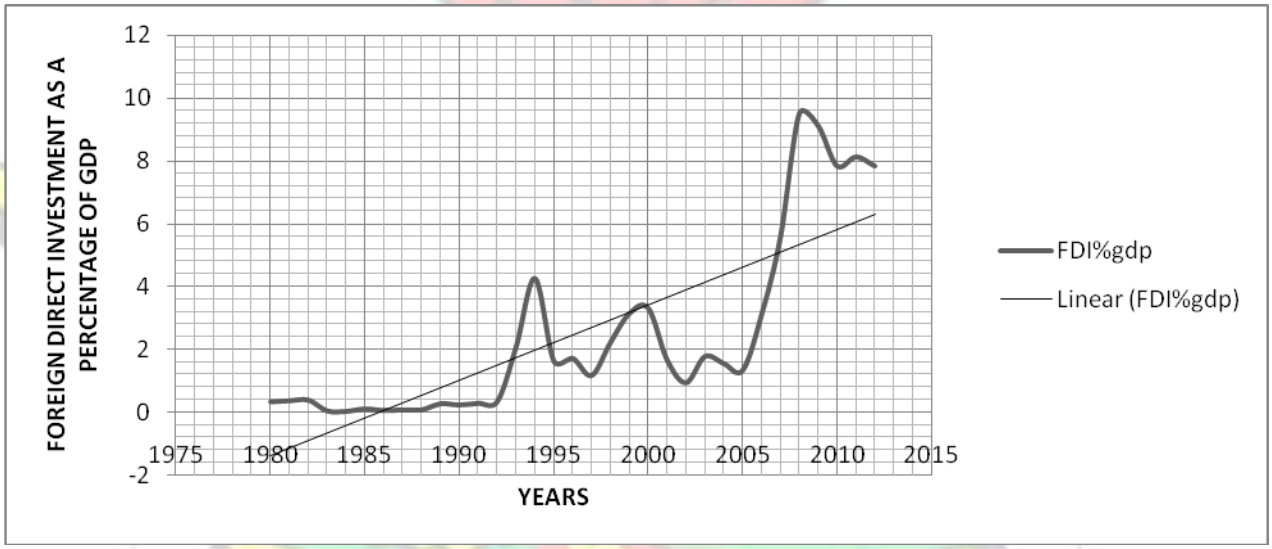
This chapter presents the results obtained from data analysis and their respective interpretations. Specifically, it consists of the trend analysis of FDI inflows, the results of

the unit root test, cointegration results, short and long run results as well as results on the Granger-causality test.

4.1 Pattern of Ghana's FDI inflows from 1980 to 2012

To obtain the first objective of the study, trend in Ghana"s FDI spanning from 1980-2012 is investigated and is depicted in Figure 4.1.

Figure 4.1 FDI inflows pattern as a percentage of GDP in Ghana



Source: Author"s own construction with data from WDI, 2014

A quick glance at trends in FDI inflows in Ghana within the period spanning from 1980 to 2012 shows that, FDI inflows have been on the increase as shown in Figure 4.1. The linear line depicted in the plot confirms the increasing trends in FDI inflows during the specified period.

In 1980"s the Ghanaian economy was faced with major set-backs in most economic

indicators. With a prior knowledge that investors prefer to invest in stable economies than unstable ones such as Ghana at the time, there were low levels of both domestic and foreign investments during the 1980"s. This resulted in low FDI inflows from 1980 to 1990 as show in the diagram. Specifically, FDI inflows were 0.35%, 0.42%, 0.04%,

0.07%, 0.09% and 0.25% of GDP in 1980, 1982, 1984, 1986, 1988 and 1990. In 1983, Ghana instigated the Economic Recovery Program (ERP) and the Structural Adjustment Program (SAP).

These recovery programs involved various macro-economic policies including liberalization policies such as trade liberalization policy and the liberalization of the financial sectors. The second phase of the FINSAP which started in 1992 resulted in a significant rise in FDI flows from 1992 to 1994 as shown in Figure 4.1. FDI inflows increased from 0.35% of the GDP in 1992 to 2.09% of the GDP in 1993 and further to 4.28% of GDP in 1994. The rate of FDI inflows in the country marginally rose after the implementation of FINSAP which caused an increase in domestic factors such as the labour workforce and marginal productivity of investment.

However, between 1996 and 1997, there was a slight decline in FDI inflows as it reduced from 4.2% in 1994 to 1.73% in 1996 and further to 1.18% in 1997. Though in 1998, 1999 and 2000, FDI inflows increased slightly as compared to 1997. Specifically, the figures were 2.23%, 3.15% and 3.33% for 1998, 1999 and 2000 and it declined between 2001 and 2005. Precisely, the figures reduced to 1.68% in 2001, 0.96% in 2002, 1.79% in

2003, 1.57% in 2004 and 1.35% in 2005. This is clearly shown in Figure 4.1. Again, in 2006, it was evident that there was a sharp improvement in FDI inflows from 1.35% in 2005 to 3.12% in 2006. From 2007 to 2009 FDI inflows have been increasing significantly from 5.58% in 2007 to 9.13% in 2009. Though from 2010 to 2012 there were slight fluctuations, from 7.85% in 2010 to 8.14% in 2011 and reduced to 7.86% in 2012 it can be concluded that FDI inflows has been rising in recent years compared to early years.

4.2 Stationarity Test

To ascertain the properties of the series of the variables specified for the study, Augmented Dickey-Fuller (ADF) test as proposed by Dickey and Fuller (1979) and Phillips-Perron (PP) test were employed. The adoption of the two tests is to check for consistency in the unit root results obtained. In both tests, the null hypothesis of nonstationarity which implies the presence of unit root is tested against the alternative hypothesis of stationarity (absence of unit root).

Table 4.1 shows the results of the unit root obtained from the ADF-test. The test consists of models with only constant and constant and trend at levels and at first difference. At the levels, in both cases, only constant and constant and trend, except Inflation ($LnINF$) and Gross Domestic Savings ($LnGDS$) all other variables are non-stationary implying unit root existence in the series. This leads to the acceptance of null hypothesis in the cases of Gross Domestic Product ( ), Foreign Direct Investment ($LnFDI$) and Government Consumption Expenditure ( ).

$LnGDP$

$LnGCEX$

Table 4.1 Test results of ADF-Test

ADF-TEST

Variables	Le vels		First Difference	
	Constant	Constant & Trend	Constant	Constant & Trend
LnGDP	3.097771	-0.047264	-4.667348***	-5.858270***
LnFDI	-0.267206	-2.784175	-4.985416***	-4.997646***
LnGDS	-3.204576**	-3.790988**	-8.137092***	-8.059869***
LnINF	-3.544721**	-5.292265***	-6.254169***	-5.098431***
LnGCEX	-2.090856	-1.069875	-5.081277***	-6.074065***

Source: Author"s own construction
Note: ***, **, *, denote significance at 1%, 5% and 10% respectively

Regarding Inflation and Gross Domestic Savings the null hypothesis of nonstationarity is not accepted indicating the stationary of series of the respective variables at the levels at 5% significant level. Thus they are integrated of order zero, I(0) as shown in Table 4.1.

Again, for models with only constant and constant with trend, $LnGDP$, $LnFDI$, and $LnGCEX$ are all significant at 1% error level at first difference. This implies that in all

three cases the null hypothesis of nonstationarity is not accepted implying the acceptance of the alternative hypothesis of stationarity. Hence the respective variables are order of integration one, *I*(1).

The PP-test results are quite the same as that of the ADF-test results as shown in Table 4.2. At the levels, for the model with only constant with no trend, $LnINF$ and $LnGDS$ are the only variables which exhibit stationarity at 5% significance level implying that the variables are order of integration zero, *I*(0).

Table 4.2 Test results of PP-Test

PP-TEST

Variables	Levels		First Difference	
	Constant	Constant & Trend	Constant	Constant & Trend
$LnGDP$	3.097771	-2.372341	-2.876538**	-3.405034**
$LnFDI$	-0.240648	-2.776747	-4.944218***	-4.954608***
$LnGDS$	-3.204576**	-3.790988**	-10.70423***	-10.87166***
$LnINF$	-3.445455**	-5.437945***	-8.683421***	--8.079651***
$LnGCEX$	-2.090856	-1.062551	-5.155710***	-6.211301***

Source: Author"s own construction
Note: ***, **, *, denote level of significance at 1%, 5% and 10% respectively

Again regarding the model with both constant and trend, only $LnINF$ and $LnGDS$ are significant at 5% significance level therefore I(0). All other variables are nonstationary at levels in both models (constant only; constant with trend).

At first difference, for a model with only constant $LnGDP$ is stationary at 5% error level,

whereas $LnFDI$ and $LnGCEX$ are stationary at 1% error level. This means that $LnGDP$, $LnFDI$ and $LnGCEX$ are order of integration one, I(1). With the model with both constant and trend also, the results are similar to the previous as shown in Table 4.2.

Based on the stationarity results obtained, it can be concluded that the series of the respective variables incorporated in the model are integrated of mixture of order zero and order one. This therefore supports the use of Bounds test within the ARDL frame work to test for cointegration.

4.3 Cointegration Test Results

Having ascertained the presence of both *I*(0) and *I*(1) integration order among the series of the specified variables, the Bounds test approach within the ARDL framework is used to test for cointegration existence among the specific variables included in the model. In other words the bounds test checks for the existence of a stable long-run equilibrium between the variables used in the model and this is depicted in Table 4.3.

Table 4.3 Results of Bounds Test Approach to Cointegration

F-STATISTICS	UPPER BOUND	LOWER BOUND
5.114950**	4.01	2.86

Source: Author‟s own construction
Note: ** represent significance at 5%error level

Results expressed in Table 4.3 shows that all variables used in the model exhibit a stable long run relationship. Result of F-statistics leads to non acceptance of the null hypothesis at 5% level of significance as against the alternative hypothesis of cointegration. Specifically, the results shows that the F-statistics of approximately 5.11 is higher than both the 95% upper bound critical value of 4.01 and the 95% lower bound critical value of 2.86, leading to the rejection of the null hypothesis of no cointegration between the explanatory and dependent variables. This implies evidence of cointegration between the variables hence the presence of stable long-run relationship between the variables.

4.4 Long-run Results

The study proceeded with the test for long run estimates of the model after establishing cointegration among the variables and the result is presented in Table 4.4.

Table 4.4 Long-run Estimated Coefficients

ARDL (1,1,0,0,2) selected based on Schwarz Bayesian Criterion		Dependent variable: *LnGDP*		
Regressor	**Coefficient**	**Standard Error**	**T-Ratio**	**Probability**
Constant	-17.8120	3.3500	-5.3170***	0.0137
LnFDI	2.4098	0.18112	13.3053***	0.0176
LnGDS	0.61119	0.16896	3.6173***	0.0001
LnINF	-0.24699	0.69282	0.35650	0.2385
LnGCEX	0.026075	0.08064	0.32334	0.0945

Note: *** represents significance at 1% level

The estimated result shows that FDI has positive and significant impact on economic growth in the long-run. FDI coefficient is 2.4098 and is significant statistically at 1% level. The coefficient of 2.4098 which is elastic means that the response of economic growth to change in FDI is high. That is, 1 percent increase in FDI inflows is accompanied by 2.4 percentage increase in economic growth and 1 percent decline in FDI inflows results in 2.4 percent decline in economic growth ceteris paribus. This however confirms empirical literature reviewed under the study which postulate direct and positive link between economic growth and FDI.

Available data on Ghana (World Bank, 2014) which is depicted in the trend line in Figure 4.1 also support the positive relationship between FDI and economic growth. For instance, from 2000 to 2008 the increase in the FDI inflow led to increase in economic growth from 1.27% 2000 to 5.69% showing direct association between economic growth and FDI.

The positive effect of FDI on economic growth revealed confirms studies conducted by Melnyk et al (2014), Andinuur (2013), Djurovic (2012), Tintim (2012), Majid and Odoba (2011) and Lonzi and Abadi (2011). However, the positive impact contradict the ambiguous and negative result obtained in the study conducted by Brenner (2014), Lund

(2010) and Noormamode (2008).

The results further show a significant positive effect of GDS on economic growth. GDS coefficient of 0.61119 shows that the elasticity is inelastic which implies that the rate of response of economic growth to change in GDS is low. That is, 1 percent increase in GDS causes economic growth to rise by 0.6 percent and 1 percent decrease in GDS will result in 0.6 fall in economic growth all things being equal and this is statistically significant at 1% level. Hence, economic growth to some extent depend on GDS in

Ghana.

For the inflation (LnINF) and government consumption expenditure (LnGCEX) the result shows negative and positive impact on economic growth respectively. This indicates that when inflation rises economic growth declines and a decline in inflation improves economic growth all things being equal. Again, the positive link between GCEX and economic growth implies that when government consumption expenditure rises, economic growth rises and a decline in government consumption expenditure will lead to a fall in economic growth all things being equal. They are however not significant implying that in Ghana inflation and government consumption expenditure does not necessarily influence economic growth.

4.5 Short-run Results

The study further used Error-Correction Model (ECM) to tests for the short-run estimates for the variables and the result is presented in Table 4.5.

ARDL (1,1,0,0,2) selected based on SBC **Dependent variable: $\Delta LnGDP$**

Table 4.5 Estimated Short-run Coefficients

Regressor	Coefficient	Standard Error	T-Ratio	Probability
$\Delta LnFDI$	2.55200	0.61728	4.13426***	0.0001
$\Delta LnGDS$	3.78091	0.87226	4.33461***	0.0002
$\Delta LnINF$	-0.419682	0.10748	-3.90474***	0.0021
$\Delta LnGCEX$	0.24883	0.11187	2.22427**	0.0358
$\Delta LnGCEX_{-1}$	0.09918	0.02988	3.31893***	0.0031
ECM(-1)	-0.58696	0.098465	-5.96110***	0.0061
R-Bar Squared	0.754395			
F-Statistic	11.11983***			
DW Statistic	2.183915			

Note: ***, ** represents significance level at 1% and 5%.

It is revealed that short run coefficient sign is not different from the analysis of the long run. The short run results show a positive effect of FDI on economic growth and this is statistically significant at 1% level. FDI Coefficient of 2.55 indicates elastic elasticity meaning that the rate of response of economic growth to changes in FDI is high in the short run.

The result further depicts significant positive effect of GDS on economic growth at 1% significance level. Coefficient of 3.78 shows elastic elasticity in the short run comparing to inelastic result exhibited in the long run. This means the responsiveness of economic growth in short run is higher compared to response rate in the long run.

The short run result for inflation shows that inflation significantly impact negatively on economic growth at 1% significance level. In the short run, 1 percent increase in inflation causes economic growth to decline by 0.4 percent and 1 percentage reduction in inflation causes 0.4 percent rise in economic growth. This further implies that inflation influence economic growth in the short run compared to long run insignificant influence.

Regarding government consumption expenditure, the result reveals a positive and significant effect on economic growth both at current period and at lag period of 1 and is significant at 5% and 1% respectively. The long run result on the other hand indicated insignificant positive effect of GCEX on economic growth. This shows that, government consumption expenditure influence economic growth in the short run. However, elasticities at both current and lag period of 1 are inelastic. The coefficient of 0.24883 and 0.099 means that 1 percent rise in government consumption expenditure causes economic growth to rise by 0.2 and 0.01 percent for the current period and lag period respectively.

Again, the R^2 of 0.75 implies that about 75% of the variations in economic growth (dependent variable) is attributed to explanatory variables; FDI, GDS, INF and GCEX. The F-statistic of 11.12 confirms that joint statistics of these variables is statistically significant at 1% level. The DW-statistic (2.183915) is high enough to explain the absence of autocorrelation in the model.

The study result further reveals that, the error correction term of -0.586 is highly significant at 1% level. It is negative and meets the convergence criteria. In other words, the coefficient of -0.586 implies that, approximately 59% of all disequilibria resulting from short term shock will restore the system to its long-run equilibrium level in the following year. These are shown in Table 4.5.

4.6 Diagnostic and Stability Test

In order to check if the regression estimates are stable over the sample period and also to check whether or not there exist time series problems such as serial correlation and heteroskedasticity a diagnostic test is performed. The study conducts a normality test in order to ascertain whether the series exhibits properties of normal distribution. Table 4.6 shows results obtained for the serial correlation and heteroskedasticity test.

From Table 4.6, it is evident that there exists no serial correlation in the residual of the variables used in the study. Based on Breusch-Godfrey LM-Test, the computed Fstatistics of 0.151602 is insignificance with regards to the respective probability value of 0.8603. A conclusion can therefore be drawn that there is non-existence of autocorrelation among the variables.

Table 4.6 Serial correlation and heteroskedasticity test results

		F-STATISTICS	PROBABILITY

SERIAL CORRELATION	Breusch-Godfrey LM-Test	0.151602	0.8603
HETEROSKEDASTICITY	Breusch-Pagan-Godfrey	1.435117	0.2373

Again the Breusch-Pagan-Godfrey shows that the computed F-statistics of 1.435117 is insignificant because it has a probability value of 0.2373. This implies that there is nonexistence the heteroskedasticity in the model. This means that the variances of the residuals are constant (homoscedastic).

The study also conducts a normality test to ascertain whether the series of the variables exhibit a normal distribution. The results are shown in the appendix. The results show a computed Jarque-Bera value of 0.341258 with a probability value of 0.843135. This implies that the series has no normality issues.

4.7 Results obtained from Granger-Causality Test

In achieving the third objective of causality between FDI and economic growth, a Granger-causality test was conducted. This was done to ascertain whether there is causal link between the variables as well as the direction. However, this does not literally mean finding whether FDI necessarily leads to economic growth and vice versa as the basic intuition behind Granger-causality test is more of prediction rather than causation. This proposes that

while the past values can predict future values, the future values cannot cause or predict that of the past values. In this vain, Y Granger causes X when the past values of Y can predict X more than the past values of X.

The first log difference of FDI and GDP are used for the analysis because Granger causality test assumes that all variables used in the test are stationary and the first log difference are stationary. The result is depicted in Table 4.7.

Table 4.7 Granger-Causality test results

Null Hypothesis:	F-Statistic	Probability
LNGDP does not Granger Cause LNFDI	5.73682	0.0233
LNFDI does not Granger Cause LNGDP	0.10595	0.7471

In Table 4.7, the null hypothesis which implies that economic growth ($LnGDP$) does not Granger cause foreign direct investment ($LnFDI$) is not accepted with a probability value of 0.0233 implying rejection at 5% significance level of the null hypothesis. A conclusion can therefore be drawn that $LnGDP$ does Granger causes $LnFDI$. In other words, past $LnGDP$ values can be used to forecast the $LnFDI$ current values. This means that there should be economic growth before there will be $\frac{LnGDP}{LnFDI}$ inflow of foreign direct

investment. That is, when there is economic growth then there is a stable economy ceteris paribus. As a result foreign direct investors will be attracted into the country. Again, the null hypothesis that $LnFDI$ does not granger cause is rejected since the value of probability is as high as 0.7471. This implies that past values cannot be used to predict $LnGDP$ current value.

The implication therefore is that, there is a unidirectional causality with no feedback effect running from economic growth to FDI.

CHAPTER FIVE

SUMMARY OF FINDINGS CONCLUSION AND RECOMMEDATIONS

5.0 Introduction

This chapter presents the summary or major findings, policy recommendations and conclusion of the study.

5.1 Summary of Major Findings

The main objective of the thesis is to empirically investigate the impact of foreign direct investment on economic growth using evidence from Ghana. The study uses annual time series data from the period 1980 to 2012. Autoregressive Distributed Lagged (ARDL) is employed for the analysis.

One of the specific objectives was to analyze the pattern of FDI inflows in Ghana over the specified period. The results show that foreign direct investment inflow into Ghana from 1980 to 2012 has been increasing due to some programmes that were introduced in the early 1980s including Economic Recovery Programme, Financial Sector Adjustment

Programme and Structural Adjustment Programme.

The study also seeks to establish the short and long run impact of FDI on economic growth. The results show that, foreign direct investment (FDI) significantly impact positively on economic growth in the long run. Gross domestic savings (GDS) was also revealed to have significant and positive effect on economic growth. The effects of both FDI and GDS on economic growth are significant at 1% level in the long run. In the long run, government consumption expenditure and inflation were found to have insignificant positive and negative impact on economic growth respectively.

Analysis of the short run results reveals significant impact of FDI, GDS, INF and GCEX on economic growth. FDI, GDS and GCEX impact positively while inflation impacts negatively on economic growth. FDI, GDS and INF impact on economic growth are at 1% significance level. GCEX effect on economic growth however is at 5% significance level at current period and at 1% significance level at lag period one.

Error correction term shown in Table 4.6 shows that, the economy will automatically adjust back to equilibrium in the long run when there are shocks. This means that any disequilibrium in the variables used in the study will be corrected in a year per the obtained result.

For the third objective of determining the causality between FDI and Economic growth, the result reveals a uni-directional causality link from economic growth to foreign direct investment. The study reveals that economic growth granger causes FDI. That is, economic growth best predict FDI in Ghana.

5.2 Conclusion

The main objective of the study was to investigate the impact of FDI on economic growth. The study however had the following specific objectives:

- Analyze the FDI inflows pattern in Ghana over the study period
  Determine short and long run impact of FDI inflows on economic growth
- Determine the causality between Economic growth and FDI.

Owing to some limitations such as data availability and other materials for the study, 1980 to 2012 period was considered using annual time series data from United Nations Conference on Trade and Development (UNCTAD) and World Bank"s World Development Indicators (WDI).

In pursuing the main and specific objectives Autoregressive Distributed Lagged (ARDL) model was employed since the variables are integrated of order zero and one.

Trend of FDI inflow into the country was a rising one from 1980 to 2012. The long run impact of gross domestic savings (GDS) and foreign direct investment (FDI) on economic growth is positive at 1% significance level. Government consumption expenditure (GCEX) has insignificance positive impact while Inflation (INF) also has negative impact on economic growth.

Short run results analysis reveals significant impact of FDI, GDS, INF and GCEX on economic growth. There is a positive effect of FDI, GDS and GCEX on economic growth but inflation however has a negative impact.

Finally, the results from causality test show that economic growth serves as the best predictor for foreign direct investment inflows in Ghana.

5.3 Recommendations

The research is important for the motive that, it seeks to provide theoretical and practical insight into how FDI foster economic growth.

Based on the result obtained and summarized in section 5.1, the following recommendations are made.

First, policies to attract foreign direct investors should be embarked upon to attract foreign direct investors into the country. As these foreign investor are motivated, its attract inflows of FDI. The increase in FDI into the country increases FDI inflow which will subsequently lead to long run economic growth.

Secondly, it is recommended that policies to increase gross domestic savings such as increases in savings rate should be embarked upon to raise capital stock accumulation which will eventually increase investment and finally economic growth of Ghana.

The study finally recommends that foreign direct investors should be given the maximum protection by the government in order to motivate them to continue their investment in the

country. Again, policy makers should stabilize the economy in terms of inflation to attract foreign investors into the country to enhance economic growth since these variables have impact on economic growth.

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APPENDIX

ARDL Bound Test Approach to Cointegration results

Dependent Variable: LNGDP
Method: ARDL
Date: 09/28/15 Time: 16:15
Sample (adjusted): 1982 2012
Included observations: 31 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): LNFDI LNGDS LNINF LNGCEEX
Fixed regressors: C
Number of models evalulated: 162
Selected Model: ARDL(1, 1, 0, 0, 2)

Variable	Coefficient	Std. Error	t- Statistic	Prob.*
	1.028164		12.15171	
LNGDP(-1)		0.084611		0.0000
LNFDI	0.003560	0.007887	0.451366	0.6561
LNFDI(-1)	-0.010925	0.008665	-1.260867	0.2206
LNGDS	0.010229	0.007373	1.387385	0.1792
LNINF	-0.015031	0.011097	-1.354504	0.1893
LNGCEEX	0.044855	0.030826	1.455103	0.1598
LNGCEEX(-1)	0.067700	0.040502	1.671517	0.1088
LNGCEEX(-2)	-0.099182	0.029884	-3.318933	0.0031
C	-0.042606	0.459418	-0.092740	0.9269

	0.798439		
R-squared		Mean dependent var	6.083761
Adjusted R-squared	0.754395	S.D. dependent var	0.211591
S.E. of regression	0.022418	Akaike info criterion	-4.520246
Sum squared resid	0.011056	Schwarz criterion	-4.103928
Log likelihood	79.06382	Hannan-Quinn criter.	-4.384537
F-statistic	11.11983	Durbin-Watson stat	2.183915
Prob(F-statistic)	0.000000		

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

ARDL Bounds Test
Date: 09/28/15 Time: 16:15
Sample: 1982 2012
Included observations: 31

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.114950	4

Critical Value Bounds

Significance	I0 Bou nd	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

ARDL Cointegrating And Long Run Form
Dependent Variable: LNGDP
Selected Model: ARDL(1, 1, 0, 0, 2)
Date: 09/28/15 Time: 16:16
Sample: 1980 2012
Included observations: 31

Cointegrating F orm

Variable	Coefficient	Std. Error	t- Statistic	Prob.
	2.55200			
D(LNFDI)		0.61728	4.13426	0.0001
D(LNGDS)	3.78091	0.87226	4.33461	0.0002
D(LNINF)	-0.419682	0.10748	-3.90474	0.0021
D(LNGCEEX)	0.24883	0.11187	2.22427	0.0358
D(LNGCEEX(-1))	0.099182	0.029884	3.318933	0.0031
CointEq(-1)	-0.58696	0.098465	-5.96110	0.0061

Cointeq = LNGDP - (0.2615 *LNFDI -0.3632 *L NGDS + 0.5337 * LNINF
-0.4748* LNGCEEX + 1.512 8)

Long Run Coeffi cients

Variable	Coefficient	Std. Error	t- Statistic	Prob.

	2.40980			
LNFDI		0.18112	13.3053	0.0176
LNGDS	0.61119	0.16896	3.6173	0.0001
LNINF	-0.24699	0.69282	0.35650	0.2385
LNGCEEX	0.026075	0.08064	0.32334	0.0945
C	-17.81200	3.35000	-5.3170***	0.0137

Diagnostic Test Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.151602	Prob. F(2,20)	0.8603
Obs*R-squared	0.462948	Prob. Chi-Square(2)	0.7934

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic 1.435117 Prob. F(8,22) 0.2373
Obs*R-squared 10.63020 Prob. Chi-Square(8) 0.2235
Scaled explained SS 5.330889 Prob. Chi-Square(8) 0.7217