

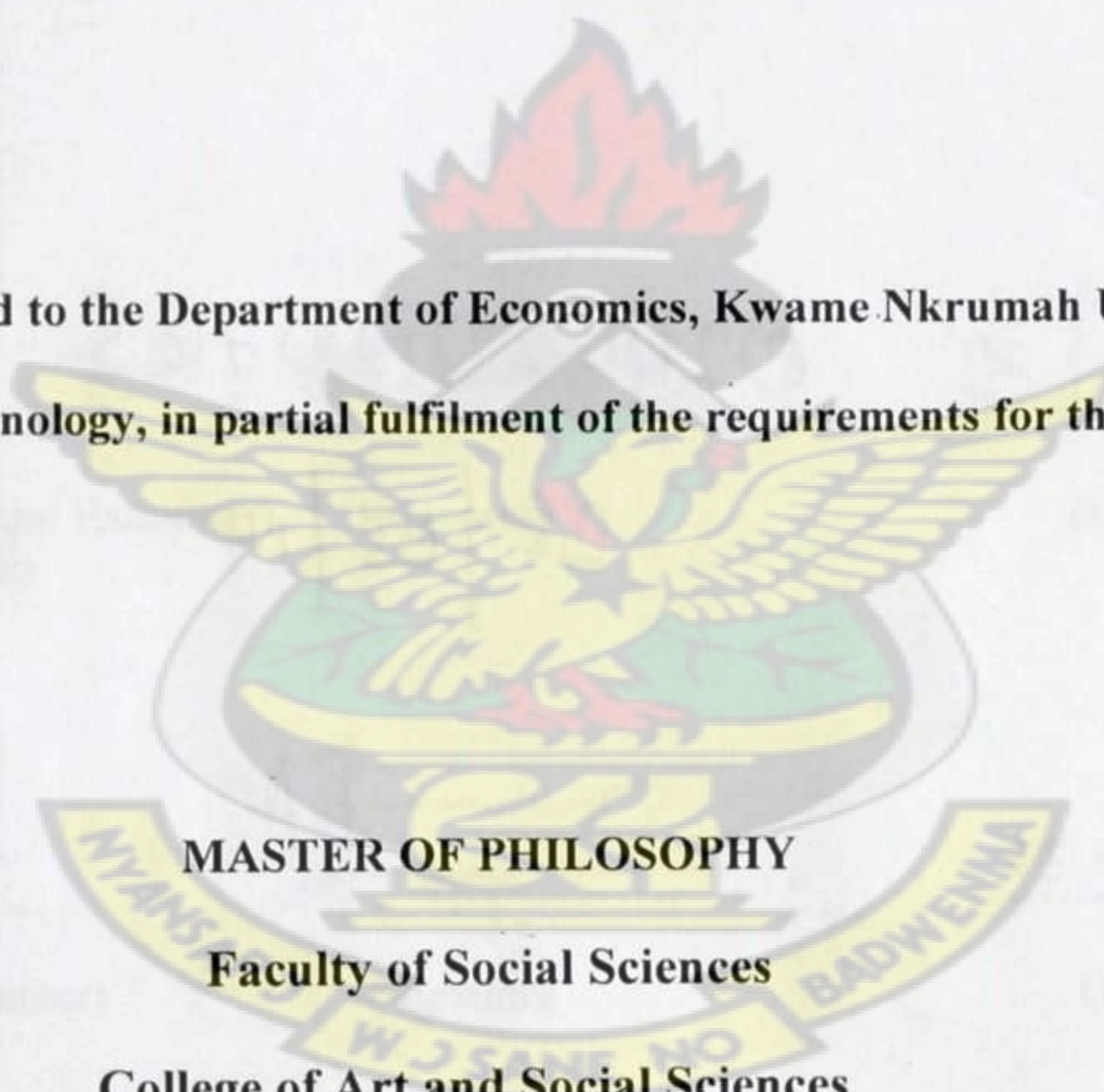
**FDI, TRADE AND GROWTH: EVIDENCE FOR GHANA, 1970-2010**

**BY**

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**A Thesis Submitted to the Department of Economics, Kwame Nkrumah University of  
Science and Technology, in partial fulfilment of the requirements for the degree of**



**MASTER OF PHILOSOPHY**

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## DECLARATION

I hereby declare that this thesis herein submitted in partial fulfilment of the requirements for the award of the Master of Philosophy (Economics) degree is my own production and has been duly undertaken under supervision except where due acknowledgement has been made in the text.

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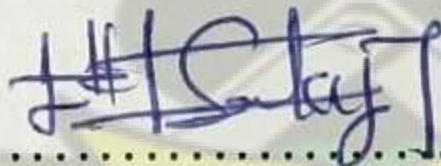
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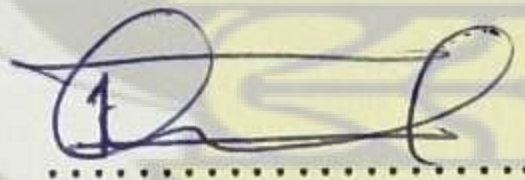
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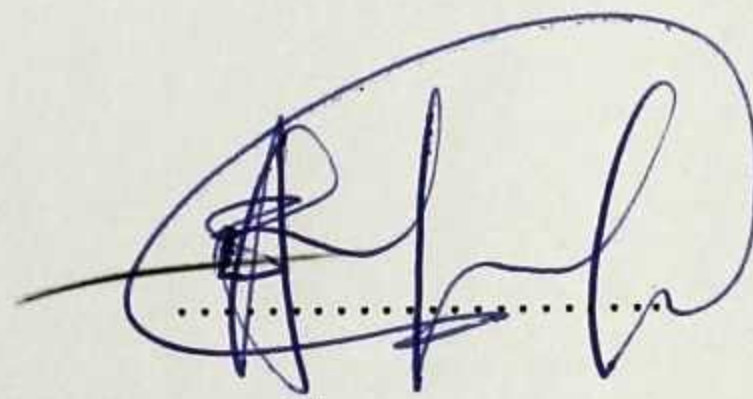
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## DEDICATION

This work is dedicated to my dear parents Mr. John Commadore and Mrs. Nancy Commadore for their invaluable support throughout the pursuit of this award..

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This work draws on the insight and hard work of some distinguished individuals. But for their support and encouragement, this study would not have come to fruition. I am most grateful to the almighty God for His guidance and protection throughout my life and for making this thesis a success.

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As it is trite knowledge that no human is infallible, I accept full responsibility for any error of fact or interpretation in this study.



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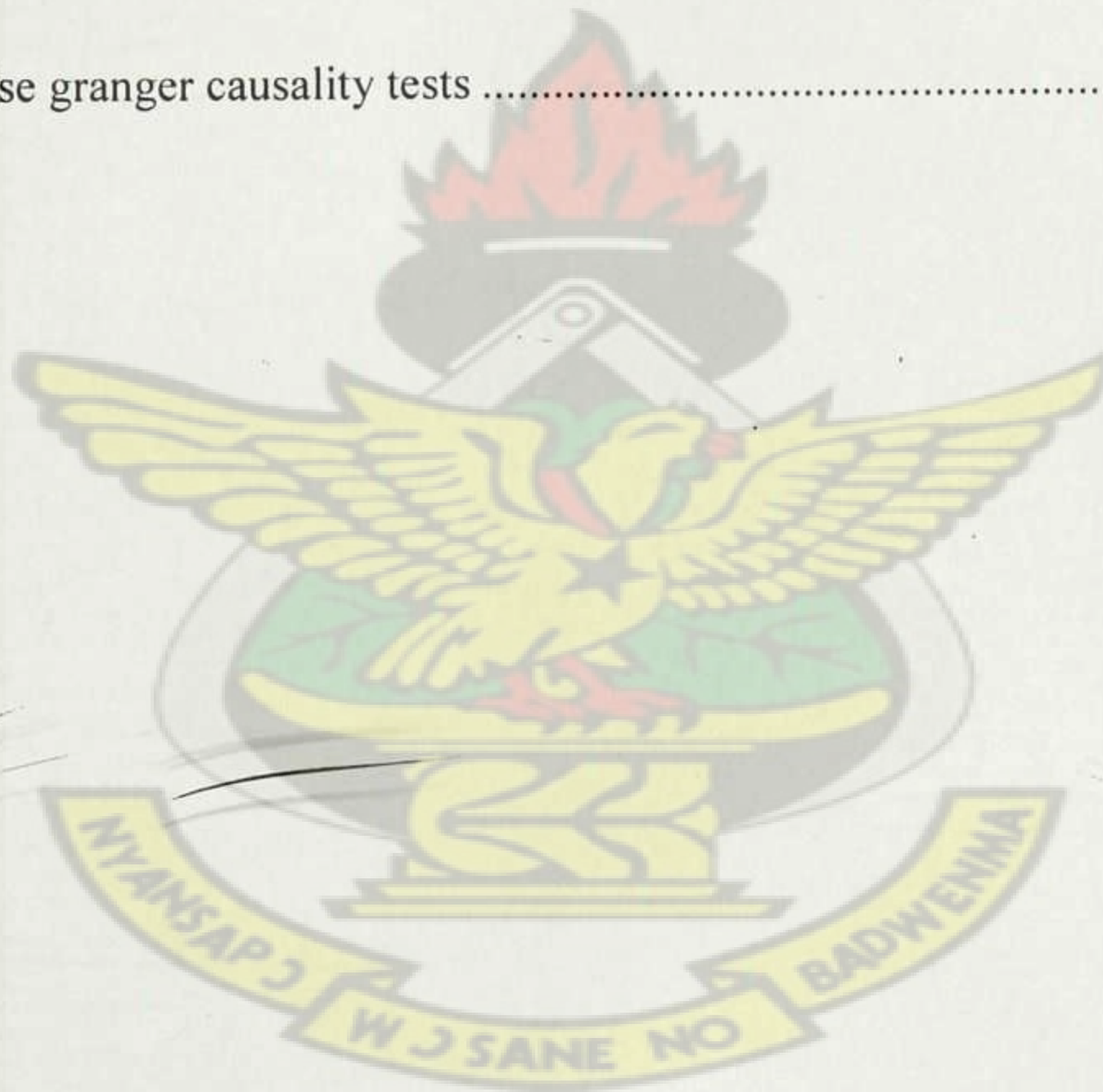
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## ABSTRACT

Since the execution of the Economic Recovery Program in the early 1980s, Ghana has adopted the two-pronged strategy of attracting Foreign Direct Investment (FDI) and concurrently liberalizing her trading system in an effort to hasten its economic growth process. Despite the strenuous efforts by successive governments to attract FDI by liberalizing investment rules, reducing trade barriers and improving the business climate, Ghana has not received as much FDI relative to other countries in the region, the trade balance keeps worsening, more so the economy is growing at below the expected average rate of 8%. This study therefore empirically examined the impact of FDI and trade on economic growth of the Ghanaian economy from 1970 to 2010 adopting the autoregressive distributed lag (ARDL) bounds test technique. The empirical results provide little evidence in support of the validity of the famous Bhagwati's hypothesis in the Ghanaian context. The role of FDI in propelling growth in the Ghanaian economy still remains ambiguous whilst trade openness has a positive and significant impact on economic growth in both the long and the short run. Unidirectional causal relationships running from growth to FDI and trade, as well as from FDI to trade was also realised. The study therefore recommends the channelling of FDI into areas of comparative advantage such as export-oriented industrial/ agricultural sectors of the economy and the promulgation of a clear-cut national policy for FDI. The study further propose the harmonisation of trade and FDI strategies in future long-term development plans and more importantly that policy makers should not wholly depend on foreign capital to spur economic growth but rather promote joint ventures between domestic capital owners and foreign investors as this will be more welfare enhancing to the Ghanaian economy.



## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the study

The nexus between foreign direct investment (FDI), trade and economic growth has in recent decades dominated the academic and policy literature of developing countries. The growing interest in this subject matter is motioned by the prominent place assumed by 'FDI-stimulating policies' in the strategies of developing countries and the need to better understand the channels through which FDI works to impact economic growth positively (Lemi and Asefa, 2003). The growing interest has also been seen as a reaction to the steady decline in official development assistance (ODA) and the fast pace of globalisation of the world economy (Asafu-Adjaye, 2005).

The past few decades has therefore seen considerable efforts by policymakers in developing countries to attract external resources in an attempt to finance savings gaps and to promote economic growth and economic development (Dornbusch, 1998). In addition to financing saving gaps, FDI introduces superior cutting-edge technology and managerial skills into the domestic economy and this has spill over effects on other sectors, thus fostering export growth and development. FDI also increases the efficiency and productivity for import substitution firms, which will enhance competition. Last but not least, FDI creates employment opportunities which directly increase GDP through factor incomes and indirectly through the multiplier effect. FDI has thus been perceived as a stronger motivation to economic growth in recipient countries relative to other types of capital inflows (The Economist, 2001).

Notwithstanding the fact that the contribution of FDI towards economic growth is widely debated, according to Musila and Sigué (2006) most empirical works concur that the benefits



outstrips its cost on the economy. The uncommon opposing arguments range from the fact that; it reduces savings and crowds out domestic investment; it is usually characterized by excessive repatriation of profits; Multinational Corporations (MNCs) merely target the domestic market of the host country and not necessarily increase exports; FDI strategies usually cause distortions in the economic policies of the host country to benefit the foreign investors; and it infuses social and cultural norms not appropriate to the host country thus slackening social as well as economic growth of recipient countries (Razzaque and Ahmed, 2000; Ram and Zhang, 2002 ; Ramirez, 2006).

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Huge FDI inflows alone cannot sustainably guarantee growth in an economy as a myriad of factors is critical in its efficacy in contributing to the development of recipient countries. Paramount among such factors is the host nation's trade policy, which has been identified as a catalyst for FDI productivity spill overs in an economy. It is against this background that the famous "Baghwati's hypothesis" contends that "with due adjustments for differences among countries.....both the magnitude of FDI flows and their efficacy in promoting economic growth will be greater over the long run in countries pursuing the export promotion (EP) strategy than in countries pursuing the import substitution (IS) strategy" (Bhagwati, 1978,1985).

It is therefore not surprising that the extent to which trade and FDI explains economic growth in developing countries has in recent times dominated debates among policy makers as well as development and international economists (see Dawson, 2006; Estrada et al., 2006). According to the World Bank (1994) countries with more liberalized trading systems relatively outperform less liberalized economies. Case in point is that of China and India who hitherto the mid-1970s inhabited majority of the world's poor, were able to chalk significant success in reducing poverty and thus subsequently hastening their economic development process during the 1980s



when they eventually reduced barriers to foreign investment (Bhagwati and Srinivasan, 2002). The experience of these newly industrialized economies re-echoes the potency of the collaboration of FDI and trade openness in reducing poverty and thus stimulating economic development (UNCTAD, 2005).

In reaction to the phenomenal economic performance of the so-called Asian tigers, in mid-1980s, most developing countries that hitherto had lots of capital controls and other trade restrictive policies liberalized their economies in an effort to attract FDI and thus consequently accelerating economic growth (Javed, et al. 2012). This eventually saw a global policy shift from import substitution policies to export-led growth policies; which are perceived as a more attractive environment for FDI (Favara, 2006).

Ghana like most other developing countries that followed suit, has since the Economic Recovery Program pursued innumerable economic reforms and liberalization of trade regimes in a bid to make her competitive in the international financial market. Among these policy interventions are the Petroleum Exploration and Production Law 1984 (PNDCL 84); the Minerals and Mining Law, 1986 (PNDCL 153) as amended by the Minerals and Mining Amendment Act, 1994 (Act 475); Ghana Investment Promotion Centre (GIPC) Act, 1994 (Act 478); the Free Zones Act, 1995 which saw the establishment of the Ghana Free Zones Board to assist and monitor the activities of the export processing Zones (EPZ) as well as attract foreign direct investment. Through these policies, Ghana has succeeded in boosting investor confidence by creating a much more liberalized FDI regime and promoting the idea of public-private partnership, privatizing public institutions. In recent times, there have been far-reaching efforts to actively promote trade and investment through the Ministry of Trade's Gateway project, the Trade Sector Support Program, the National Export Strategy and signing of other trade conventions like the African Growth and Opportunities Act (AGOA) in 2000, the Cotonou



Agreement between the African, Caribbean and Pacific (ACP) group of States and the EU, the Interim Economic Partnership Agreement (IEPA) in 2007 among others.

Through these policies, Ghana has experienced a persistent increase in inward FDI flows over the past two decades. FDI inflows into the Ghanaian economy increased tremendously over the past two decades with an annual average figure of US \$118 million for the periods 1990-2000. After the late 1990s, FDI inflow further rose from US \$89.3 million in 2001 to US\$2.527 billion in 2010 with an all-time high value recorded in 2010 (contributing to 8.0% of GDP) following the huge amounts of capital requirement needed to facilitate the oil production (World Development Indicators, 2011). Traditionally, Europe, the United Kingdom, the United States and Italy are the largest sources of FDI flows to Ghana, mainly into mining and other resource-based activities. It is worth mentioning the increasing significance of Asian investors specifically from China, India and Malaysia in the recent bout of privatization in Ghana. On the global front, Ghana's ranking in terms of inward FDI potential index was 110 in 2005 rose to 104 in 2009 (World Investment Report, 2011). According to UNCTAD's trade policy review (2006), the key factors determining the course of FDI into Ghana include its political and economic stability, and competitive wages.

Ghana's trade system has also been fairly liberalized since the execution of the IMF and World Bank's Structural Adjustment Program (SAP) in the early 1980s. The post-SAP period saw the execution of various import substitution policies and this subsequently witnessed a continuous decline in both ratios of export and import volumes to GDP from 20.7% to 3.6% and 18.5% to 3.3% respectively in the periods of 1970-1980 (World Bank, 1985). By the completion of the Economic Recovery Program (ERP), the country's international financial reputation had tremendously improved; export values had risen from US\$773.4 million (13.49% of GDP) in 1986 to US\$1234.70 million (22.63% of GDP) in 1994. The contribution of non-traditional exports sector was also quite significant with a 5.8% annual average increase in its share in



exports between 1986 and 1995. As a result of the trade liberalization policies, import volumes also increased from US\$712.5 million in 1986 (12.43% of GDP) to US\$1728.0 million in 1993 (28.51% of GDP) (World Development Indicators, 2001). Indeed, like China and India, this Ghanaian experience largely substantiates the fact that trade openness tends to contribute to economic growth.

With respect to the terms of trade, Ghana being a heavy net importer has experienced persistent decline in its terms of trade since 1996 and this has had adverse implications for the economy. On the average, imports contributed 60% of total trade between the periods of 1990 and 2010 whereas exports contributed to about 40% in the same period (UNCTAD, 2010). The periods of 2003 to 2011 for instance saw an annual average trade deficit of US\$ 688.4 million with an all-time high of US\$131.7 million in December of 2003. A record low of US\$ 1604.3 million was however registered in September of 2008 (World Development Indicators, 2011). The nation's trade openness has however increased considerably since the 1980s with total trade increasing from some 20% of GDP in 1980 to 103% in 2006. By the year 2010, total trade as a percentage of GDP for the Ghanaian economy stood at 71 %.( World Development Indicators, 2011).

## 1.2 Problem statement

Since the execution of the Economic Recovery Program in the 1980s, Ghana has adopted the two-pronged strategy of attracting FDI and concurrently liberalizing her trade system in an attempt to maximize its gains from trade. There have been strenuous efforts to attract FDI by successive governments such that Ghana has astoundingly improved the business environment for both domestic and foreign investors (UNCTAD, 2003).

Despite liberalizing investment rules, reducing trade barriers and improving the business climate, Ghana has not received as much FDI as expected by the government (Aryeetey, et al. 2008). Although Ghana's absolute FDI levels has increased in recent times, in relation to other



peer African countries the figures are pretty gloomy. Between the period of 2000 and 2008, Ghana has attracted only between 0.05% and 0.1% of total FDI to all developing countries and as share of FDI to sub-Saharan African countries in the same period, it received between 0.5% and 2% of FDI flows (UNCTAD 2008). Indeed, the unbalanced distribution of FDI inflows in favour of the mining sub-sector has failed to generate the necessary linkages to the wider economy for anticipated economic growth (Frimpong and Oteng-Abayie, 2006).

More importantly, Ghana's balance of trade has been worsening since 1996 with the annual average share of external trade balance (exports minus imports) in GDP adversely increasing from -12.4% for the periods of 1990-99 to -17.5% for the periods of 2000-09. The periods of 2003 to 2011 for instance recorded an average trade deficit of US\$ 688.4 million per annum with a record low of US\$ 1604.3 million being registered in September of 2008 (World Development Indicators, 2011).

Concerns about the potential of the economy to grow at the expected rates still remains mixed. Until 2008, the economy still grew below the average expected rate of 8% which has been the key policy objective of the various National Development Plans drawn within the past two decades. The average real GDP growth for the 1980 to 1989 and 1990 to 1999 periods was only 2.6% and 4.3% respectively while that of the period of 2000 to 2009 recorded an annual average growth of 5.8%. Assessing the economy at the more efficient level of real GDP growth per capita, the periods of 1980-89, 1990-99 and 2000-09 recorded an average growth of -1.1%, 1.6% and 3.5% respectively (African Development Indicators, 2011). Though this suggests an improvement in the Ghanaian economy, the slow growth of the economy only compounds the growing concerns about Ghana's ability to meet the targets of the Millennium Development Goals (MDGs) and more importantly its national policy plan by 2015.



The widening trade deficit as a result of increased trading in import-substituted goods, the relative abysmal inward FDI performance coupled with the inability of the Ghanaian economy to grow at expected rates notwithstanding the innumerable policies and strategies executed by successive governments over the past three decades casts a lot of doubts about the extent to which the numerous trade and investment liberalization policies have manifested into the economic fortunes of the Ghanaian economy.

### 1.3 Objectives of the study

The primary objective of this study is to empirically examine the impact of FDI and trade on economic growth in pre and post economic liberalization periods of the Ghanaian economy using the autoregressive distributed lag (ARDL) bounds test technique. Pursuant to this aim, the following objectives have been set:

- to assess the long run relationships and interactions between FDI, trade and economic growth.
- to investigate the role of other critical macroeconomic variables in Ghana's economic growth model.
- to examine the nature of causalities and magnitude of changes in FDI and trade on economic growth.

### 1.4 Hypothesis of the Study

In an effort to adequately meet the objectives of the study, the following hypothesis would be tested:

1.  $H_0$ : FDI has no significant impact on economic growth in Ghana.

$H_1$ : FDI has a significant impact on economic growth in Ghana.



2.  $H_0$ : Trade has no significant impact on economic growth in Ghana.  
 $H_1$ : Trade has a significant impact on economic growth in Ghana.
3.  $H_0$ : FDI-trade interaction has no significant impact on economic growth in Ghana.  
 $H_1$ : FDI-trade interaction has a significant impact on economic growth in Ghana.
4.  $H_0$ : Economic liberalization has no significant impact on economic growth in Ghana.  
 $H_1$ : Economic liberalization has a significant impact on economic growth in Ghana.
5.  $H_0$ : Domestic capital and labour have no significant impact economic growth in Ghana.  
 $H_1$ : Domestic capital and labour have a significant impact economic growth in Ghana.

### 1.5 Significance of the Study

The main thrust of the study is to examine the impact of FDI and trade on economic growth in pre and post economic liberalization periods of the Ghanaian economy. This study attempts to contribute to the empirics of the impact of FDI and trade openness in three ways.

Firstly, it contributes to this literature by focusing solely on the Ghanaian economy using up-to-date data. Over the years, there have been too much emphasis on the role of FDI with less efforts to better comprehend the how FDI and trade liberalization may interact to explain growth. According to Mansouri (2007) the extent to which FDI boosts economic growth is highly dependent on the trade regime adopted in the county so that all things being equal, the more liberal the trade regime of a country is, the more likely it is to perform better in attracting and using FDI to hasten its economic growth. Given that the closest work in concept done in relation to the subject matter in Ghana, only made use of data from the 1970- 2002, this study will thus throw more light on how trade and foreign investment policies have impacted on economic growth of Ghana over the past few decades. New evidence was thus expected. This study thus extends the work of Frimpong and Oteng-Abayie (2006) in two ways; by introducing



new data and; by introducing and interaction term to cater for the joint impact of FDI and trade on economic growth.

Secondly, the study attempts to critically analyse the channels through which FDI impacts on trade and how this leads to economic transformation and development. The joint impact of the FDI and trade will thus be established. More so, a more recent econometric technique by way of the (ARDL) bounds testing approach to cointegration as developed by Pesaran et al (2001) will be adopted for the analysis.

Furthermore, the study contributes to the Ghana's empirics on FDI and trade at the global level by probing into how Ghana's unique FDI and trade - growth relationship compares with other peer countries. It is therefore hoped that the study would add to the body of knowledge of FDI, trade and growth relationships in Ghana and thus serve as the basis for further research in academia and policy formulation. Knowledge of the direct and indirect effects of the interaction of FDI and trade will go a long way to guide the adoption of key policies to channel FDI into productive areas of the economy which would eventually hasten the economic growth process of the country and subsequently aid the country in meeting the Millennium Development Goals (MDGs) and more importantly the goals of Vision 2015.

**1.6 The scope of the study**

Generally, the study seeks to investigate the impact of FDI and trade on economic growth in pre and post economic liberalization periods of the Ghanaian economy. In this regard, the study captures theoretical and empirical discussions of FDI, trade and economic growth. The study further highlights FDI as well as trade policy and performance in Ghana. Annual time series data spanning the periods 1970-2010 for which data is available will be used for the analysis. Thus the sample size will be forty-one (41) years. The period of study has the advantage of obtaining adequate degrees of freedom for the analysis. This is because it is long



enough to adequately account for the various trade and investment policy reforms in the early 1980s, the recent torrential floods of FDI inflows, the global financial crisis, the oil discovery process and the fast paced economic growth of Ghana inter alia key economic events. To this end, relevant data were sourced from the UNCTAD statistics 2010 and the World Bank's Development Indicators (2011) for the analysis.

### **1.7 Limitations of the Study**

The purpose of this study is to empirically examine the impact of FDI and trade on economic growth in pre and post economic liberalization periods of the Ghanaian economy. But for the fact that official FDI data only starts from 1970, the scope of the research would have encapsulated the Ghanaian economy from independence. Despite this shortfall, the sample size of the study which covers a significant period of post-independence Ghana, is enough to come out with reliable results. More so, the heavy reliance of the study on secondary data from diverse source also poses a threat to the findings of the work as limitations arising from such sources are unavoidable.

Furthermore, due to the unavailability of some variables, proxies of those variables were used which may have a bearing on the result. Finally, only growth models or production function with the same dependent variables were used for the analysis, using other models with varied dependent variables could have given different results.

### **1.8 Organization of the Study**

The study is structured as follows. It proceeds by critically reviewing relevant literature on the subject matter as it relates to the global economy, developing countries and the Ghanaian economy. Chapter three captures the methodology and explores the theoretical and econometric frameworks adopted for the study and provide an in-depth overview of the estimation procedures. The presentation and analysis of empirical results is captured in chapter four,



whilst chapter five summarizes the study, and draws conclusions and provides key economic policy recommendations.

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## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter generally reviews relevant literature on the subject matter as it relates to the global economy, developing countries and the Ghanaian economy. The chapter is broadly divided into two sections. The first section explores theoretical and empirical literature in relation to FDI, trade and growth. The second section presents an overview of Ghana's trade and growth landscape inter-alia FDI and trade stimulation policies. To this end, existing materials on historical trends in FDI inflow and trade as well as factors that account for their patterns are critically explored.

#### **2.2 Theoretical perspectives on FDI, trade and growth**

##### **2.2.1 FDI defined**

According to United Nations Conference on Trade and Development (UNCTAD) World Investment Report (2008), FDI is defined as “an investment involving a long term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or foreign affiliate)”.

The International Monetary Fund's Balance of Payment Manual (1993) which is the detailed benchmark definition of FDI according to OECD (1996) also defines FDI as “an investment made to acquire lasting interest in enterprises operating outside of the economy of the investor”.

In an attempt to introduce some quantitative elements to the definition, IMF further defines FDI as “direct” when an investor holds 10% or more of voting stock in an enterprise operating in an economy other than that of the investor. It therefore embodies the sum of equity



capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments (World Development Indicators, 2011)

Lipsey (2002) defines FDI as a particular form of flow of capital across international boundaries from home countries to host countries. These flows give rise to a particular form of international assets for the home countries, specifically, the value of holdings in entities, typically corporations, controlled by a home country.

Finally, according to Shim et al. (1995) foreign direct investment refers to long-term participation by country "A" in management, joint venture, transfer of technology and expertise in country "B".

The definitions above clearly imply that FDI does not merely constitute the movement of capital from one country to another, but also has a lot to do with the injection such funds into an operating business ventures in the recipient country over a period of time. It is important to note that for such funds to be considered as FDI, according to the IMF, the investor must hold 10% or more voting stock in the enterprise operating in the host economy.

### **2.2.2 FDI theories**

A plethora of theories have been propounded to explain the impact of FDI on the host economy. Extensive reviews of the main FDI theories range from the product life cycle theories of Vernon (1966), the internationalisation theories of Rugman (1981) and Dunning's (1993) eclectic paradigm inter alia other theories. The theoretical literature on FDI and its effect on an economy suggest that the applicable theories lend themselves to classification into two main traditional schools of thought: The Modernisation and Dependency schools. There is however the third school; Integrative school which integrates the concepts of the traditional schools that are applicable to current FDI analysis. The study however focuses on the two main traditional theories due to their sole emphasis on the impact of FDI as well as trade on economic growth.



- **The Modernisation Theories**

The basic tenet underlying this school of thought stems from the neoclassical and endogenous growth theories. The school of thought is thus reflected in the perfect market approach as exemplified in the neoclassical and other perfect market theories while its imperfect market approach is culminated in the theory of the firm as well as in the industrial organization theory and internalization theory. They maintain an optimistic stance with respect to the potency of FDI in promoting economic growth in developing countries largely because FDI augments the already scarce capital resources in these countries. FDI as a vehicle for transfer of technology thus contributes to long-run growth in larger measure than domestic investment (Easterly, 1994). More so, FDI introduces superior technology, new ideas, and managerial expertise from the advanced countries to the developing world and this invariably sets the recipient country to 'take off' into self-sustaining growth and development (Rostow, 1960; Adams, 2009). Thus through FDI, the basic requirements such as quality human capital, stable economy, and access to open markets which are essential to the economic growth of any economy is provided.

Modernization theory therefore views the collaboration of FDI inflows and international trade as positive forces to economic growth because they stimulate specialization, create efficient division of labour, industrialization and urbanization (Burkhart and De Soysa, 2003). Inkles (1974) thus asserted that 'the factory can be a school for modernization of the economy'. Though the school views FDI as a catalyst for sustainable growth and development in the recipient countries it also contends that for FDI to effectively play its role, the economy must firstly rid itself of superfluous state interventions and secondly, liberalise its trade as well as foreign investment policies. In the long run, the process is expected to equalize input prices, real wages and economic levels around the world (Rostow, 1980). This standpoint is culminated in the big bang theories in Europe and the structural adjustment norms in Latin America and Africa (Wilhelms and Dean-Witter, 1998). More so, some studies confirmed the modernization



thesis directly or indirectly by demonstrating that FDI promotes economic growth independently (Firebaugh, 1996; De Soysa and Oneal, 1999), or conditionally on the level of human capital, the quality of local financial markets and the economic sector receiving FDI. (Borenzstein et al., 1998; Alfaro et al., 2004; Alfaro, 2003).

As already established, the modernisation school of thought on FDI was very much inclined to both the neoclassical and perfect market theories that assumed perfect competition. Since perfect market theories oversimplify reality, the market theory of the modernisation school of thought was extended taking into account the structural rigidities, which invariably impede economic growth and thus prevents recipient economies from taking full advantage of FDI inflows (Brecher and Alejandro, 1977; Bhagwati and Tironi, 1980).

#### • **Dependency Theories**

The dependency school entails dependencia (neo-Marxist) and structuralist theories (Wilhelms and Dean-Witter, 1998). Following the failure of modernization theories due to the slow growth of the developing world despite the large capital transfers, dependency theory argued that the teleological, deterministic view of modernization theory was flawed. This saw the advent of the so called 'dependency theories' which contended that economic ties between the developed and the developing world were precipitated by neo-colonial interests that perpetuated a system of 'unequal exchange' thus creating economic underdevelopment in developing countries (Burkhart and De Soysa, 2003).

To this end, the dependency school of thought advocate a negative relationship between FDI inflow and economic growth and thus perceived FDI inflows as threatening to the sustainable growth and development of recipient countries since international trade and investments rather promotes the Machiavellian interests of Multi-National Corporations (MNCs) in host economies. According to their argument, the modern MNC was an exploitative one that



ventured into weaker markets in pursuit of monopoly profits and consequently ended up extracting more than it brought in. In that regard, FDI (MNCs) was a mechanism of the capitalist world to ingeniously exploit poorer societies. The hierarchical organisational structures of the modern MNC was therefore perceived as a replacement of the defunct 'primitive' forms of exploitation such as capitalist slavery, capitalist serfhood, and formal colonialism (Bornschieer and Chase-Dunn, 1985)

Another argument advanced by the school of thought was that FDI inflows rather led to "underutilization of productive forces" in recipient countries largely because it ultimately creates a monopoly controlled market structure. The notion behind this assertion was that a foreign controlled-economy will not grow in an articulated manner due to weak "multiplier effect" in creating the productive linkages into other sectors (Amin, 1974; Bornschieer and Chase-Dunn, 1985; Adams, 2009). This was in fact spurred by the direct involvement of some MNCs in politics in the most insidious ways in host economies in an attempt to influence policy that allows monopolistic profit. Studies like that of Rhagavan (2000) therefore argue that FDI may have a negative effect on growth if the inflow of FDI leads to increased monopolization of local industries. This assertion is hinged on the fact that once powerful MNCs make a long-term commitment to a country, they politically align themselves (Armijo 1999).

Softer dependency theories further contend that instead of FDI stimulating broad-based development it rather created enclave economies since 'dependent development' benefited narrow elites in the recipient economies. They therefore conclude that massive inward FDI of MNCs and reliance on international trade rather widened the income inequality gap within the host economy (Cardoso and Faletto ,1979; Evans 1979). Dependency theorists therefore advocate that FDI destructs local entrepreneurship, crowd out domestic firms, increase



unemployment, stifle technological innovation and strengthen the recipient country's authoritarian regimes (Wallerstein, 1974; Held, 1991; Dixon and Boswell, 1996; Moran, 1996; Feenstra and Hanson, 1997; Rodrik, 1997).

In sum, the two main theories on FDI express differing opinions on how FDI inflow affects the economic fortunes of developing countries. Overall, the literature on the FDI-growth nexus offers contradictory theoretical predictions. It is not surprising that evidence to suggest that massive inward FDI coupled with trade liberalisation spurs higher economic growth still remain mixed and inconclusive especially for developing countries (Srinivasan and Baghwati, 1999; Frankel and Romer, 1999; Dollar and Kraay, 2000). The implications are that FDI has both costs and benefits and that FDI is necessary but not a sufficient condition for economic growth (Adams, 2009). Notwithstanding the fact that the contribution of FDI towards economic growth is widely argued, most empirical works concur that the benefits out strips its cost on the economy (Musila and Sigué, 2006).

### 2.2.3 Trade theories

International trade issues by and large focus on explaining trade flows between nations, the nature and extent of gains or losses to an economy as well as the effects of trade policies on an economy. Theoretical perspectives on trade and trade liberalisation under this study will thus focus on the classical trade theory; factor proportion theory; and the product life cycle theories of trade. Other relevant trade theories like the famous Baghwati's hypothesis and the export-led growth hypothesis (ELGH) are also reviewed.

It is worth noting that explanations to international trade and patterns among countries preceded the birth of economics as a science in 1776. The mercantilist period (pre-economic science) witnessed the emergence of articles in relation to international trade. Key among these was that of David Hume who connected the advent of international trade to the desire of nations to amass



as much wealth (gold) as possible. This was particularly vital in taking control of other nations since it aids in armament. Given such trade patterns among nations, some nations tend to benefit more than others thus creating a situation of gainers/winners and losers with some nations generating surpluses while others suffered deficits.

- **Classical trade theory**

Spearheaded by Smith (1776) and Ricardo (1817), the classical trade theory argues that the extent to which a country exports and imports relates to its trading pattern with other nations. The early reasoning that free trade could be beneficial for countries was based on the concept of absolute advantages in production propounded by Adam Smith in his book; *Wealth of Nations*.

Adam Smith (1776) fundamentally altered the course of international trade analysis that pertained before the *Wealth of Nations* by arguing that international trade will not last if it perpetually creates a situation where one party loses by way of deficits. For international trade to last, it must remain mutually beneficial to all parties involved. In that regard, his theory of absolute advantage postulates that if two countries are endowed with diverse natural resources, then it is advantageous for each to embark on specialization in the goods and services which they have an economic advantage, after which they can trade to meet their needs and requirements.

The Ricardian model on comparative advantage also elucidates trade as a “win-win situation” where participatory countries benefit despite differences in technology or wages. He did this in his two goods-two countries-one factor of production example. The specialization concept under the model increases welfare in both nations by means of improvements in production and consumption efficiency. When countries specialize in their comparative advantage good, it leads to an improvement in world production efficiency. After trade, general wages and incomes between countries are also better off.



To this end, classical trade theory argues that for countries to benefit from trade, they should produce goods and services in which it has an advantage for consumption indigenously, and subsequently exports the surplus while importing those goods and services for which they have an economic disadvantage. Economic advantages/disadvantages of a country are thus embodied in its resource endowments, labour, capital, technology or entrepreneurship. As stated by Adiningsih, et al. (2008) international trade as proposed by Smith and Ricardo ensure that each party engaged in trade benefits from it and this eventually enhances production efficiency and welfare at the global level. Suranovic (2009) also posits that the increased world production efficiency ensures that the terms of trade between the trading countries exhibits a higher consumption pattern for each good in each country with specialization and trade than was possible under autarky.

Following this line of argument, one can conclude that increased international trade fuelled by FDI inflows and effective trade liberalisation policies ultimately improves efficiency which in turn spurs technological progress in the host economy. In sum, the classical trade theory suggests that the basis for international trade emanates from the differences in production characteristics and resource endowments between countries and this has formed the foundation for subsequent trade theories that are rooted in the differences in endowments countries have. One slack of the theory however is its inability to explain what causes differences in relative economic advantages (Morgan and Katsikeas 1997).

- **Factor proportion theory**

Contrary to the classical trade theory, the factor proportion theory seeks to explain the differences in economic advantages that give rise to international trade in the first place. In that regard, the theory extensively emphasizes on the idea of economic advantage by considering the



role of endowment and costs of factors of production in international trade. The basic precept underlying this theory is that countries will tend to specialize in the production of goods and services that makes use of their most abundant resources. In other words, countries are more likely to produce and consequently export goods and services that harness relatively large amounts of abundant domestic resources, while they import goods and services that require relatively large amounts of factors of production that are relatively scarce (Heckscher and Ohlin, 1933).

The standard Heckscher-Ohlin (H-O) theorem propounded by Eli Heckscher and his student Bertil Ohlin in the 1920s therefore states that "each country exports the good intensive in the country's abundant factor...". That is each country exports that good which it produces relatively better than the other country. Thus, it will be more efficient for a country that is capital-abundant to export the capital-intensive good while the country which is labour-abundant exports the labour-intensive good. In this model a country's advantage in production arises solely from its relative factor abundance.

The model further argues that trade improves welfare for participatory nations since countries attain higher levels of aggregated utility (welfare) as compared to autarky and that countries are better off with free trade. This implies that countries engaged in free trade are both better off. Suranovic (2009) therefore classifies the aggregate welfare gains from international trade into two distinct effects; production efficiency gains and consumption efficiency gains. Considering the fact that the shift from autarky to free trade entails some redistributive effects where the country's relatively abundant factor gains from trade, while the country's relatively scarce factor loses from it, one distinguishing factor is brought to light by this theory in that the benefits from trade will not necessarily be received by all individuals. According to Krugman and Obstfeld (2006), though in the long run, a country's scarce factors lose from trade



and the abundant factor extensively benefits as a result, the gains evidently outweigh the losses, and “overall” gains from trade should be expected.

Contrary to the dictates of the H-O theory, Leontief (1951) in his famous *Leontief paradox* found that US import substitutes were about 30 per cent more capital intensive than US exports notwithstanding the fact that the US was the most capital abundant nation. According to Salvatore (1990), though subsequent refinements by way of Vernon’s product life cycle resolved the paradox, recent empirical studies partially supported the theory.

It is worth noting that both the classical trade and the factor proportion theories have been deficient in explaining recent patterns of international trade (Morgan and Katsikeas, 1997). The tremendous technological progress and the surge in multinational enterprises witnessed in the 1960s called for new theories of international trade that could account for the changing trends (Leontief, 1966). The factor proportion theories still remains relevant since it overtly explains how differences in resource endowments are sufficient to cause trade and it shows what impacts will arise entirely due to these differences. The theories therefore point to the fact that despite the low capital endowments of developing countries they can still trade however massive inward FDI when effectively utilised could maximize the potential benefits from trading in the global market thus stimulating sustainable growth and development.

- **Product life cycle theory**

Following the technological progress and the rise in multinational enterprises in the 1960s international trade theories fell short of explaining trade patterns. This saw the dawn of the product life cycle theories that became useful in explaining and predicting international trade patterns in the face of multinational enterprises. With Vernon (1966, 1971) and Wells (1968, 1969) as its key advocates, the product life theory basically advances a trade cycle. Additionally, the theory explains how a product invariably becomes a country’s export and goes



through the life cycle and eventually becomes an import good, that is the comparative advantage shifts to nations with cheap labour.

Per the cycle, a country's exports are strengthened as a result of product innovation by the nation with highly skilled labour and technology. Then in an effort to take advantage of lower costs of production, production starts in foreign subsidiaries. The domino effect is the increased competitiveness of the said product by the foreign subsidiary on the international export markets. The final process of the product life cycle is an emergence of import competition in the parent firm's domestic market.

The international product life cycle theory thus extensively emphasizes the critical role played by technological innovation and market expansion in current patterns of international trade. While technology is facilitated by the creation and innovation of products, market size and structure remains prominent in the extent and type of international trade (Morgan and Katsikeas, 1997).

While the product life theory is quite insightful in explaining international trading patterns, it fails to account for inherent impact of government involvement and regulations in the system. This therefore saw the advent of other new theories of trade that accounted for some of these factors. However, according to Morgan and Katsikeas (1997), the several assumptions of these theories often undermine their potential significance and contribution to international business. Some of the assumptions range from the fact that; perfect information for international trade opportunities exist; traditional importing and exporting are the only mechanisms for transferring goods and services across national boundaries; factors of production are immobile between countries (Bradley, 1991).

In conclusion, the product life theory is particularly relevant in explaining international trade as well as investment patterns. Theoretically, it links the three variables under this study; FDI,



trade and economic growth. As a result of the superior technology required for product innovation most MNCs undertake the research and development (R&Ds) in their home economies, only to extend production to their foreign subsidiaries in the developing world through the FDI mechanism. With the goods being produced efficiently due to the relative lower cost of factors of production, the product from the developed world becomes competitive on the global market implying high export performance. Following from the dictates of export-led growth hypothesis, this ultimately stimulates economic growth of the recipient country. The motivation of the topic was therefore derived from this theory.

- **The export-led growth hypothesis**

Theoretically, the nexus between trade and economic growth has been well documented and articulated by various economists since the Adam Smith's inquiry into the nature and causes of the wealth of nations (1776). The logic underlying this relationship stems from the fact that economies need to export goods and services in order to amass enough revenue to finance purchases of goods and services that cannot be efficiently produced in the domestic economy (Coutts and Godley, 1992).

The export-led growth hypothesis clearly elucidates the direct and intuitively obvious effects of trade (exports) on economic growth. *Ceteris paribus*, if revenue from exports increases, the gross domestic product of a nation will rise. Following from the elementary relationship between exports and economic growth, several economic theorists have explored several ways through which international trade can influence economic growth. As the Ricardian model posits, exports can increase productivity as well as hasten economic growth if investment is channelled to the most efficient sectors (comparative advantage sectors) of the economy (Kunst and Marin, 1989). Thus since the exposure to international markets requires improved efficiency so as to optimize benefits from trade, it supports product and process innovation



activities, while increasing specialization encourage exploitation of economies of scale (Temple, 1994).

Similarly, exports provide revenue by way of foreign exchange. This in turn finances imports that invariably assimilate knowledge of foreign technology and managerial expertise, in so doing promoting cross-border knowledge spill overs (Grossman and Helpman 1991). In other words, export performance spurs economic growth in a country's economy in the form of technological spillovers and other related favourable externalities (Marin, 1992). The sources of these knowledge spill overs include, on the one hand, direct access to foreign knowledge through interactions with foreign buyers and, on the other hand, incentives for labour training and more efficient management due to increased international competition (Chuang, 1998).

Despite the wide range of potential benefits that an export-oriented strategy gives to countries, several arguments have been advanced by some economists that the positive productive effects do not automatically apply to developing countries. In that regard, one critical issue raised is predominantly crude nature of exports of developing countries. With such high dependency on primary exports, less attention is given to the manufacturing sector; which is unfortunately the sector that can generate the required externalities to spur economic growth. The dependence on primary export sector is not adequate to stimulate growth since the sector lacks the necessary linkages to have spill over effects on the economy (Herzer, 2007). More so, the production of primary exports is highly subjected to diminishing returns since they are mostly land-based. In that regard, there is a cap to employment in production set by the point where the marginal product of labour falls to the minimum subsistence wage. This problem however does not arise in the manufacturing sector where less fixed factors of production are involved, and production may be subject to increasing returns. In practice, it is more likely that the real resource gains from specialisation may be offset by the real income losses from unemployment for countries



specialising in diminishing returns commodities. Thus complete specialisation and free trade would not be optimal for developing countries.

Additionally, the absorptive capacity of non-export sectors in developing countries are quite low since most of the firms use very backward production technology and the workers are mostly low-skilled and are unable to make extensive use of knowledge spill overs. To this end, Edwards (1993) argued that a certain level of technology and human capital in the export sector itself as well as the non-export sector may be necessary to acquire and benefit from foreign technology.

Finally, according to World Bank (2009), many developing countries are characterised by excessive business and labour regulations that hinders the flexibility of factor prices and the mobility of factors between sectors. In the presence of severe factor-market imperfections, an increase in exports may lead to productivity losses (Edwards, 1988).

The considerations above suggest that the growth enhancing effects of exports is not automatic as it depends on factors like; the type exports being exported, the absorptive capacity of the export sector and the degree of business and labour regulations. The implications are that the effects of exports on economic growth vary from one country to the other and that in the short run through increased specialisation the economy can be improved. However, the ability of exports to stimulate growth in the long run largely depends on the capacity of the export sector to create positive spill overs on other sector. Thus it is possible to have positive short-run, but negative long-run effects.

- **Bhagwati's hypothesis**



While a plethora of evidence today suggests that FDI inflow does indeed stimulate higher economic growth through trade, the premise is found to be not always true when the trade policies of the economy are considered.

The study of the relationship between FDI inflows and economic growth in the face of trade regimes, is commonly credited to Bhagwati's well-known hypothesis which invariably states that "with due adjustments for differences among countries for their economic size, political attitude towards FDI and stability, both the magnitude of FDI flows and their efficacy will be greater in countries pursuing the export promotion (EP) strategy than in countries pursuing the import substitution strategy (IS)" (J. Bhagwati, 1978). Thus, the potency with which FDI inflow can invariably promote economic growth is increased by export promotion policy and decreased by import substitution policy.

According to Bhagwati (1978), the growth enhancing effects of FDI is highly dependent on the incentives offered by the recipient country through its trade policies so that countries with a relatively liberalised trade regime attract more FDI (volume effect). Also, the efficiency effect suggests that such countries see increases in efficiency (*i.e.* productivity spillovers) resulting directly from FDI (Balasubramanyam *et. al.*, 1996). In essence the hypothesis sheds more light on the fact that higher trade barriers which are synonymous with import substitution strategies may attract a relatively lower FDI since they inefficiently protect the local market against imports of competitors. The positive contribution of a liberalised trade regime towards economic growth is hinged on the fact that liberalization increases specialization and division of the labour thus consequently improving productivity and export potentials as well as economic performance. More so, due to the relatively greater efficiency of liberalising trade per the experience of the East Asian countries, many of the developing countries followed suit with the export-led strategies in the 1980s.



The hypothesis has thus sparked curiosity among most international as well as development economist on how crucial trade regimes of an economy impacts on not only the efficacy of FDI but the ability of the economy to attract FDI. Empirical works like that of Balasubramanayam et al. (1996) thus focused on testing the validity of the hypothesis for some 46 developing countries; their results indicated a higher association between FDI inflows and faster growth for 10 to 18 export-led strategy developing countries. Additionally, they argued that FDI rather than domestic investment drives growth in export promoting countries. Other empirical works by Lloyd and MacLaren (2000); Jonsson and Subramanian (2001) on Asian economies also braced the hypothesis.

Furthermore, the OECD (1998) lent their support to the hypothesis through their cross country studies, which revealed that the growth-enhancing feature of FDI is more potent in an environment characterized by a liberalised trade regime and macroeconomic stability. In a related report, the World Bank(1993) also found that countries with more liberalised trade systems relatively outperformed economically less liberalised countries (World Bank, 1993). It is interesting to note however that some few economists like Harrison (1996) and Rodriguez& Rodrik (2001) still have some reservations with regards the trade openness-led growth nexus due to the negative impact it sometimes imposes on developing countries who become vulnerable after liberalising.

The motivation of this study therefore is to investigate the validity of the Baghwati's hypothesis in the case of the Ghanaian economy which has had quite a significant inward FDI and has experienced both liberalised and restricted trade regimes, since gaining independence in the late 1950s.



### 2.3 Empirical Literature

This section critically reviews earlier works on the relationship between FDI inflows, trade and economic growth in both the developed and developing countries. In an effort to holistically analyse how Ghana's FDI and trade- growth empirics compares with other country studies this section would be classified under the following three headings: (a) Studies analysing the relationship between FDI inflows and economic growth (b) Studies analysing the relationship between FDI and trade (c) Studies analysing the relationship between FDI inflows, trade and growth.

- **Studies analysing the relationship between FDI inflows and economic growth.**

Despite the fact that theoretical literature by way of the neoclassical and new growth models emphasis the wide range of economic benefits of increasing FDI inflows, empirical evidence on the causal relationships between FDI inflow and economic growth at the macro level still remains contradictory, with results ranging from unidirectional causality, bidirectional causality, or even no causal relationship between FDI and economic growth. There also exists contrasting evidence in the cross country and country specific studies on the FDI-led growth hypothesis.

At the cross-country level, Balasubramanyam et al. (1996) employed the OLS method to estimate the relationship between economic growth and FDI inflows using data for 46 developing countries for the periods of 1970 to 1985. Their results indicated that FDI has significant positive spill-overs on economic growth in countries adopting export promoting policies whereas countries dominated with import substituting policies had weaker positive effects.

In another comprehensive study for 69 developing countries during the two periods of 1970 - 1979 and 1980 - 1989, Borensztién et al. (1998) found that FDI has a positive effect on economic growth, but the magnitude of the relationship depends on the quality of the



human capital of the host country. He thus asserted that FDI is an important vehicle for the transfer of technology with a minimum threshold of human capital stock in the host country and thus contributes relatively more to economic growth than domestic investment.

De Mello (1999) investigated the relationship between FDI and economic growth for a sample of 32 OECD and non-OECD countries. Using time series and panel data analysis for the period 1970-90, his results supported the hypothesis that FDI has a positive impact on growth whenever FDI augments domestic investment.

Similarly, Li and Liu (2005) using a panel of data for the period of 1970-1999 for 84 countries applied the simultaneous equation system approach and were successful in providing substantial evidence of a clear linkage between FDI and economic growth. Khawar (2005) examined the influence of FDI on GDP per capita from 1970 to 1992 and confirmed a strong positive association between FDI and economic growth. He also observed that an increase in FDI induces to a relatively large increase in GDP per capita growth, especially when compared to other variables like domestic investment.

Contrary to the results from the country studies by Balasubramanyam et al. (1996); Borensztein et al. (1998); De Mello, (1999), Li and Liu (2005) and Khawar (2005), other studies like the UNCTAD (1999) found no clear relationship between FDI and economic growth of selected countries. Their analysis indicated that the relationship between the variables were either positive or negative depending on the variables that enter the regressions. It is no wonder that Dutt (1997) could not empirically detect any linkage between foreign investment and per capita growth rates.

Similarly, Carkovic and Levine (2002) using a panel data of 72 developed and developing countries analysed the relationship between FDI inflows and economic growth. In employing a cross-sectional OLS analysis, a dynamic panel data analysis and the Generalized-Method-of-



Moments (GMM) methodology, they found no robust link running from inward FDI to host country economic growth. They thus concluded that FDI inflows do not exert an independent influence on economic growth and that its impact on growth is dependent of other growth determinants.

In a related work, Ram and Zhang (2002) using cross-sectional regression framework based on data for the 1990s, found that FDI boosts host economies' income growth rates. However, they asserted that the results are not robust to all their model specifications.

Recent works however focus on establishing the relationship between FDI and economic growth at the country level since the relationship varies from country to country depending on factors like domestic investment, macroeconomic stability, human capital, and infrastructure and trade policies (Bhattacharya et.al, 2011).

Other country-specific studies that have examined the link between FDI and economic growth adopting a range of methodological approaches found no reciprocal causality relationship between economic growth and FDI (Kabarsi et al. ,2000; Chakraborty and Basu, 2002; Ouattara, 2005; Ayanwale, 2007; Karimi, Mhammad sharif and Yusop ,2007; Frimpong and Oteng – Abayie ,2006). Other works in developing countries like Nigeria (Akinlo, 2004; Amaghionyeodiwe and Osinubi, 2010) and Ghana (Gyapong and Karikari, 1999) could not establish a positive linkage between FDI and economic growth.

Chakraborty and Basu (2002) investigated the existence of a causal relationship between FDI and output growth in India using the Johansen cointegration test and the vector error-correction approach. Using annual time series data from 1974-1996, they found a one way causality from real GDP to FDI. The share of import duty in the tax revenue which they used to proxy trade openness was found to be insignificant in neither the FDI inflow nor GDP models. FDI



liberalisation which was proxied by a dummy was however statistically significant in FDI inflows (Chakraborty and Basu, 2002).

Empirical evidence from Nigeria points to a mixed experience for the impact of FDI on economic growth. Akinlo (2004) examined the nexus between FDI and economic growth in the Nigerian economy (where the extractive industries are the highest recipients of FDI inflows). Utilizing the Johansen cointegration test and the error-correction model, his results revealed that FDI to the extractives sector does not enhance growth as much as FDI in the manufacturing sector. In a related study, Ayanwale, (2007) also confirmed that the overall effect of FDI on the economy is negative notwithstanding the fact that the components of FDI positively impact on economic growth (Ayanwale, 2007). Contrary to these works in Nigeria, Amaghionyeodiwe and Osinubi (2010) in using time series data for the period 1970 to 2005 applied the Johansen test for cointegration to show that Foreign Private Investment has a positive significant effect on economic growth of Nigeria. Obwona (2001) also examined the impact of FDI on growth in Uganda. His results revealed a positive but insignificant relationship between FDI and economic growth of the Ugandan economy.

Chang (2007) also used the Johansen cointegration test, the multivariate error correction model, and the Granger causality tests to examine the causal relationship between FDI and economic growth for the Taiwanese economy. His results revealed no causal relationship between FDI inflows and economic growth.

In Ghana, few studies have been conducted to establish the relationship between FDI and economic growth. Gyapong and Karikari (1999) examined causal relationships between FDI and economic performance in Ghana and Ivory Coast for the 1960 to 1980 periods. Employing the correlation, causality, and cointegration tests, their results indicated that the impact of higher economic performance on FDI depends crucially on the strategy of the investment



in the country. Specifically, export-oriented FDI responds positively to higher economic performance because such investments are consistent with trade policies that are usually promoted when the economy grows. To this end, Ivory Coast which had a superior economic performance enhanced the inflow of export-oriented FDI; but, in Ghana, where FDI took the form of market development in response to an import-substitution strategy, the effect was ambiguous with a negative relationship between exports and FDI being detected because protection switches demand to domestic products and imposes an implicit tax on exports..

Asafu-Adjaye (2005) in using time series data from 1970 to 2003 investigated the extent to which FDI impacts on economic growth found out that in the short-run, there was no statistically significant effect of FDI on economic growth. However, in the long-run, FDI exerted a significant positive influence on economic growth.

In a major study to investigate the causal link between FDI and GDP growth for Ghana in the pre- and post-SAP periods, Frimpong and Oteng-Abayie (2006) employed the more robust Toda-Yamamoto (1995) granger no causality test. Using annual time-series data from 1970 to 2002 their results showed no evidence of either growth driven FDI or FDI-led growth for the total sample period and the pre-SAP period. There was however evidence of FDI-led growth during the post-SAP period where the economy has enjoyed a relative political stability and economic freedom. According to them, the absence of FDI-led growth in the pre-SAP as well as the entire block periods can be explained by the fact that FDI inflows to the country have been generally minimal and probably under the threshold needed to generate growth. More so, over 70% of FDI inflows to Ghana which has gone into the mining sector is not capable of creating the necessary linkages that could fuel the growth process of the economy.



From the literature it is evident that the relationship between FDI and economic growth differs from one country to another implying that the relationship is not automatic. Thus a country's ability to take advantage of the positive effects of FDI depends on local conditions such as the educational level, development of the local financial markets, the trade policies of the country (Borensztein et al, 1998; Alfaro et al (2004), Mansouri, 2005) . This implies that the absorptive capacity is crucial here.

- **Studies analysing the relationship between FDI and trade.**

There are few attempts to relate FDI to trade in developing countries. Following from Mundell (1957), FDI was perceived as a substitute to trade. This proposition was however highly disputed by Agmon (1979) and this saw the surge in empirical works aimed at investigating the complementarities that exists between FDI and trade. Later works like that of Helpman (1984), Helpman and Krugman (1985) and Grossman and Helpman (1991) therefore hypothesised that the complementary relationship is normally found for vertical FDI cases. Recent works however thoroughly explore the relationship between FDI and trade by taking a more cohesive approach.

With respect to cross country studies, Asiedu (2002) in his study on the determinant of FDI in 32 sub-Saharan African (SSA) countries and 39 non SSA developing countries found a positive effect of trade openness on FDI. Additionally, he found that FDI and trade are complements. However, the marginal benefit from increased trade openness was found to be less for the SSA countries. The studies of Kandiero and Chitiga (2003) also investigated the impact of openness to trade on the FDI inflow for some selected African countries over these four periods: 1980-1985, 1985-1990, 1990-1995 and 1995-2001. Their results showed that FDI responds well to increased trade openness in the whole economy and especially in the services sector.



Additionally, they found out that further reduction in tariff and nontariff barriers such as licensing or cumbersome procedures increases FDI inflow.

Contrary to the cross country studies above, Razafimahefa and Hamori (2005) in a related study on some selected developing countries in SSA, Latin America and Asia found trade openness to have a positive but insignificant relationship with FDI inflows.

At the country level, Zhang and Felmingham (2001) evaluates the causal links between inward FDI and export performance of China at the national and provincial level. Using the cointegration and the error correction modelling (ECM) techniques on time series data from 1986 to 1999, their results revealed bidirectional causal relationship between inward FDI and Exports at a national level. The provincial studies also revealed similar results of two-way causality for the coastal and western China.

Baliamoune-Lutz (2004) examines the causal relationship between FDI, Exports and economic growth in Morocco for the periods of 1973 to 1999 adopting the Granger causality test. The result indicates a two – way causal relationship between FDI and exports in the Moroccan economy.

Astatike and Assefa (2005) investigated the nature and determinants of foreign direct investment in Ethiopia using time series data from 1974 to 2001. Their findings show that growth rate of real GDP, export orientation, and liberalisation, among others, have positive impact on FDI. Likewise, Salisu (2003) also found that whereas the openness to trade had a positive and significant effect on FDI, both per capita income and growth rate of GDP were statistically insignificant determinants of FDI in Nigeria.

Dasgupta (2007) investigated the impacts of international trade and investment related macro-economic variables, namely, exports, imports and FDI inflows on the outflows of FDI from



India. Utilising Maximum Likelihood method of Johansen approach to cointegration on time series data for the Indian economy from 1970 to 2005, he found a unidirectional causality relationship running from export and import to FDI outflows. There was however no causality from FDI inflows to the corresponding outflows for the Indian economy.

In Ghana, Abosi (2008) examined the main factors that drive foreigners' decision to undertake direct investment in Ghana. Utilising the ordinary least squares as well as the error correction model on time series data from 1975-2005, he found out that gross domestic product per capita and openness of the economy to trade had a significantly positive influence on foreign direct investment between 1975 and 2005. In a related work, Tsikata et al. (2000) also found export-orientation as a significant determinant of FDI inflows to Ghana.

In general, the empirical evidence supports the theoretical argument in favour of favourable liberal trade regimes as important determinants of FDI as inferred from the causal relationships.

- **Studies analysing the relationship between FDI inflows, Trade and Growth**

Whilst there is a vast collection of empirical literature on the FDI-growth and trade-growth nexus, there are very few when assessing the impact of the interaction of FDI and trade on economic growth which this study seeks to examine. Few studies like Balasubramanyam et al. (1996); Karbasi et al. (2005). Mansouri (2005) and Mah (2010) focused on this approach. This section however reviews the empirical literature from developing countries that tend to assess the three variables of concern collectively.

At the cross-country level, Khan and Leng (1997) investigated the correlation between FDI inflow, exports and economic growth for Singapore, Taiwan and South Korea. Using aggregate level data for the period of 1965 to 1995, their results showed no evidence to support the causal relationship between FDI and Exports in Taiwan and South Korea. A causal relationship from exports to FDI inflow was however found for Singapore.



Athukorala and Chand (2000) analysed the determinants of productivity of international production of United States manufacturing affiliates in 44 developed and developing countries. Their results supported Bhagwati's hypothesis and thus revealed that productivity gains from international production was greater under a more liberalised trade policy regime compared to a restrictive regime.

Karbasi et al (2007) also examined the role of FDI and trade on economic growth using cross-section data of 42 developing countries over three decades. Adopting the framework of endogenous growth theory they found out that FDI, trade, human capital, and domestic investment contribute significantly to the economic growth for developing countries. They further revealed that FDI's contribution to growth is facilitated by its positive interaction with human capital, sound macroeconomic policies and institutional stability. To this end they found out that the interaction of FDI and trade yields a positive and statistically significant impact on economic growth while the individual effects of FDI and trade were positive but not significant.

In a related work, Ahmed et al. (2008) examine the effect of exports, imports and FDI on economic growth of selected SSA countries namely Ghana, Kenya, Nigeria, South Africa and Zambia using the Pedroni estimation procedure which apparently allows for heterogeneity across individual countries. The results indicated that exports and FDI have a positive and statistically significant impact on economic growth of the countries. Causality tests conducted provided some evidence of existence of a two-stage causal chain of exports, imports and income. The estimation results indicated a bi-directional Granger causality between FDI and exports in Ghana, Kenya and Nigeria. South Africa and Zambia however had granger causality running from FDI to exports. In the Ghanaian case, there was a one way causal relationship from GDP to exports.



Similarly, Ullah et al. (2012) investigated the relationship between FDI, trade and economic growth for some selected South Asian countries namely Bangladesh, India, Pakistan and Sri Lanka using annual time series data from 1973 to 2010. After employing the Granger Causality approach their results supported the export-led growth more as compared to FDI-led growth in all selected South Asian countries. A unidirectional causality relationship was found from GDP to imports. Likewise, the results indicated a one-way causal relationship from GDP to trade openness. The results however indicated a bi-directional causal relationship between FDI and trade Openness for all the selected countries.

There is also no consensus in the results from empirical studies done at the country level. This in fact mirrors the results of the cross country studies.

Liu et al (2002) examined the causal relationship between FDI inflow, trade and economic growth in the Chinese economy using quarterly data for exports, imports, FDI and growth from 1981 to 1997. The results indicated a bi-directional causal relationship between FDI inflow and exports. In a related work, Zhang (2005) also found a superior influence of FDI on export performance in China at the industrial level.

Kohpaiboon (2004) analysed the role of trade policy regimes in conditioning the impact of FDI on growth performance of Thailand. The study sought to investigate how FDI interaction with trade openness impacts on economic growth, using data for the period 1970-1999. Adopting the Johansen Co-integration approach, his results supported the 'Baghwati's' hypothesis that, other things being equal, the growth impact of FDI tends to be greater under an export promotion (EP) trade regime compared to an import-substitution (IS) regime. He found that the interaction between FDI and trade openness had a positive and significant impact on economic growth in Thailand.



Mansouri (2005) also sought to analytically and empirically test the impact of FDI-trade regime interactions on economic growth of Morocco. He employed the aggregate production function as the theoretical framework and the Johansen's Maximum likelihood procedure to examine the long run relationship between the variables for the periods of 1975 to 2002. His results indicated that FDI has entered with a negative but statistically insignificant impact on economic growth in the short run while the FDI-trade interaction impact is seen to boost economic growth in the long run. Thus FDI flows to Morocco are growth-enhancing when they are accompanied with trade liberalization.

Alalaya (2008) examined the causal relationship between FDI, trade and economic growth for Jordan using time series data from 1990 to 2008. Adopting the ARDL model for cointegration, he found a one-way causal relationship running from trade and FDI to economic growth. Additionally, the study found the speed of adjustment in the model to be 0.587 which seems relatively high and significant.

Baharom et al. (2008) empirically confirmed that trade openness has a positive and statistically significant long run as well as short run relationship with economic growth in the Malaysian economy. They further revealed that FDI inflow only has a positive and significant association with economic growth in the short run. The long run analysis demonstrated a statistically significant negative association.

Belloumi (2012) also examined the dynamic causal relationships between FDI, trade and economic growth in Tunisia. Applying the bounds testing (ARDL) approach to cointegration on time series data for the period from 1970 to 2008, he found out that FDI, trade and economic growth were bound together in the long-run when foreign direct investment is the explained variable. His results further revealed that there is no significant causality



whatsoever between these variables and growth in the short run however a unidirectional causality from FDI to trade was found.

N'guessan and Yue (2012) examined the long-run impact of FDI and trade openness on economic growth in Cote d'Ivoire using data from 1980-2007 and adopting the more recent bounds testing cointegration approach (Pesaran et al, 2001) and the VAR Granger causality/block exogeneity. Utilising Wald tests, they found a long run relationship between the FDI, trade openness and output in Cote d'Ivoire. The causality tests revealed a unidirectional causal relationship from FDI, trade openness to output and from output, FDI to trade openness thus both FDI and trade openness were found to be significant in explaining output growth in Cote d'Ivoire.

In relation to Ghana, although a lot of empirical studies have been done on the individual impact of FDI and trade on economic growth however; few studies have attempted to assess how the FDI-trade interaction impacts on economic growth in Ghana. Frimpong and Oteng (2006) adopted the bounds test approach to examine the FDI, trade and growth relationships in Ghana for times series data from (1970 -2002). Their results contrarily indicated a negative impact of FDI on growth but a positive and significant trade – growth relationship.

Finally, a related work by Tandoh et al. (2012), concluded that trade openness, and exchange rates from 1980 to 2007 period are positively and statistically significant in determining growth in the short run, but negative and significant in the long run. However FDI was found to be negatively and statistically associated in the short run with growth, but positively associated in the long run with economic growth in Ghana.

To this point, there have been diverse and somehow conflicting empirical evidence in both cross-country and country level studies on both the FDI-growth and trade-growth nexus



analysis. While most studies confirmed a one-way causal relationship from FDI, trade to economic growth only in the short run, only few cross country studies found a bi-directional causal association. Largely, differences in methodological approaches, definitions, and data used, data measurements, time frame among other factors can be major factors accounting for the differing results. However one common trend is observed, in that most of the results from Africa mostly suggest a one-way causality from FDI, trade openness to output.

From the few empirical works done on the nexus between FDI, trade and economic growth in Ghana, it is evident there was too much focus on the individual impacts of FDI and trade on economic growth in Ghana. The results from past works are still mixed and this clearly mirrors the happenings on the global front. One can therefore conclude that little or none has been done to ascertain how the interaction of FDI and trade impact inures to the economic growth performance of the Ghanaian economy. This study therefore seeks to bridge this literature gap by testing the validity of Baghwati's hypothesis for the Ghanaian economy.

## **2.4 Overview of the Ghanaian economy**

### **2.4.1 Ghana's growth experience**

As at the time of independence, Ghana was a better-placed developing country with its level of economic development at par with the "Asian tigers" such as Thailand and South Korea. Strategically positioned as the world's leading producer of cocoa, the nation's per capita income was generally high (Aryeetey, et al. 2000). The growth of the economy was generally stable and the national economic health was fraught with balance of payments deficits, a sound budgetary situation and a well-functioning public administrative system (Aryeetey and Fosu, 2005 and Akoena, et al. 2007).

Shortly after gaining independence in the late 1950s, Ghana was fraught with political unrests from the mid-1960s through to the 1970s. This inhibited the growth of the economy as the



annual average growth rate of GDP per capita was repressed to -0.3% and -0.7%, for the periods of 1960 to 1969 and 1970 to 1979 respectively. The situation was further compounded in the 1980s as the average growth rate of GDP per capita further dipped to -1 % (World Development Indicators, 2012). Thus, the per capita GDP growth rate fluctuated continually from 1970 – 1980 with minimum level of -14% and the highest rate of 6.7% in 1975 and 1978 respectively. Aryeetey and Fosu (2005) therefore posited that ‘growth was turbulent during much of the period after mid-1960s and only began to stabilize after 1984’. External factors which led to decline range from the severe droughts in the early 1980s, decline in the global commodity prices of traditional exports, high interest rates on international financial markets to the impact of the repatriation of Ghanaians from Nigeria in that period which consequently stalled the country’s growth by reducing the per capita GDP.

The period after 1983 witnessed a fairly stabilized economy with a continuous increase and stable GDP per capita growth to date. This was precipitated by the implementation of the World Bank and the International Monetary Fund’s (IMF) Economic Recovery Programme (ERP) in 1983 and later Structural Adjustment Programme (SAP) in the Ghanaian economy. Aimed at reversing the economic turmoil and restoring the country's international economic standing of the Ghanaian economy, the ERP helped the country make the transition from a control system of economic management to a market economy despite the criticisms that it ignored the plight of those not involved in the export sector. Indeed, after three consecutive years of experiencing negative GDP per capita growth rate i.e. from 1980 to 1983, Ghana steadily experienced positive growth rate of GDP per capita annually. From 1984 to 2010, the GDP per capita growth rate has averaged about 2.4% per annum with the highest and lowest growth rates being recorded in 2008 (5.8%) and 1994 (0.49%) respectively. O’Connell and Ndulu (2000) therefore attributed the sluggish per capita GDP growth rate (below the 4%) since the Economic Recovery Programme to low productivity in the economy.



In recounting the growth experience of the Ghanaian economy, it is relevant to mention some of the development plans rolled out by successive governments in the past two decades in an attempt to propel Ghana from a lower income country to an upper middle income country. Paramount among such plans is the Vision 2020 programme (1993) which had the primary aim of transforming the economy into an upper middle income country by 2020 (Aryeetey and Fosu, 2005). Under this programme, the economy was expected to grow at an average of 8% for the period if the target is to be met (IEA Economic review, 1992). This has not been quite the case as there was a huge deviation from between the targets and the actual indicators. For instance with the expectations that between the periods of 1996 to 2000, the economy would grow between 7.1% and 8.3% per annum, actual growth was between 4.2% and 5%. According to Baafi (2010) this ultimately translated into low per capita GDP growth and poor sectorial growth.

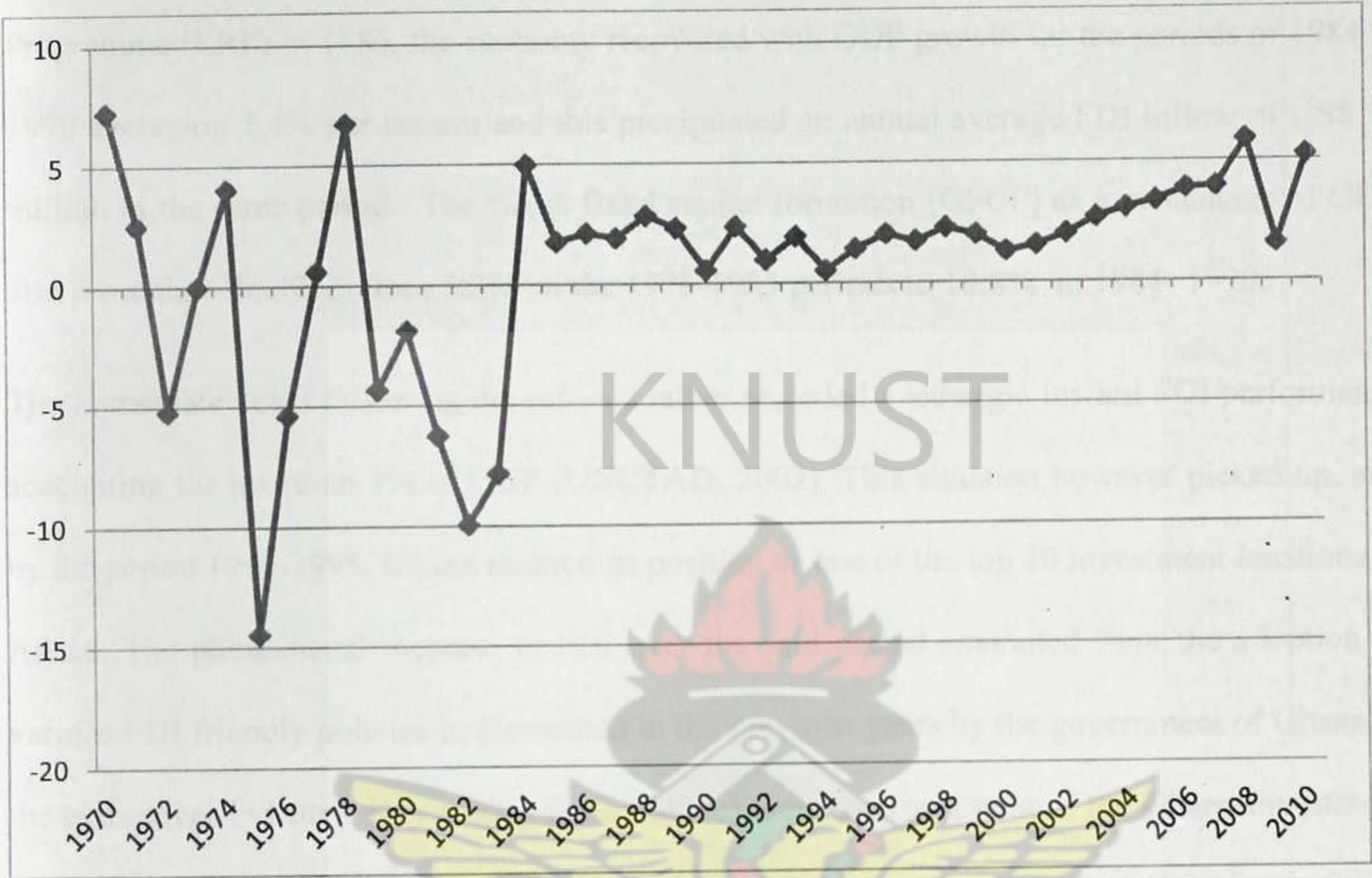
Growth since 2001 has been rising slowly at an average rate of 3.2% per annum with few dips in 2004 and 2009. This consistent rise in the growth rate is attributed to the recovery of agricultural production and general improvement in economic management, particularly in the area of fiscal and monetary policies (AfDB/OECD, 2003). Other contributing factors include the fact that by 2004, Ghana through the HIPC initiative had received a total debt relief of approximately \$3.5 billion and the discovery of oil and its tremendous impact on the economy. This led to rise in real output growth since 2001, with sustained increases from 4.2% in 2001 to 6.4% in 2008 (Databank Economic Analyst monthly Report, March 24, 2009).

Ghana has therefore been one of the best performing countries in the sub-region for the past decade, economically, socially and politically. Despite the fact that Ghana's average annual growth rate of GDP per capita was 3.2%, which was one of the highest growth rates in Africa, according to Aryeetey and McKay (2005) this is insufficient to drive the economy towards the



achievement of the Millennium Development Goals (MDGs). Figure 2.1 shows the trend of per capita GDP growth rate of Ghana from 1970 - 2010.

Figure 2.1 Trends in Ghana’s GDP per capita growth rate (1970-2010)



Source: Compiled from the World Development Indicators (2011)

#### 2.4.2 Ghana’s FDI landscape and investment reforms

Touted as one of the first countries in Africa to execute economic reforms in the early 1980’s, Ghana has generally been an avid recipient of FDI in the sub region. The switch from pro import-substitution policies to export-led policies in the 1980s invariably directed the fortunes of the country with regards foreign capital inflows. The period prior to the 1970’s saw the execution of more strenuous import-substitution policies by the government of Ghana in an effort to strengthen the internal stability of the economy. Initially, the annual FDI inflows rose to as high as \$68 million for about two years, but heavily plummeted in the subsequent years,



with negative numbers (net outflows) being recorded by the late 1970s. By the mid-1980s, FDI inflows into the Ghanaian economy were hovering at under \$5 million (0.12% of GDP).

Following the intervention of the IMF and the World Bank by way of the Economic Recovery Programme (ERP) in 1983, the economy recovered with GDP growth for the periods of 1984 to 1990 averaging 5.4% per annum and this precipitated an annual average FDI inflow of US\$ 13 million in the same period. The Gross fixed capital formation (GFCF) as a percentage of GDP also more than doubled from 5.2% in the 1978-1983 periods to 10.8% in 1984- 1990.

The immediate years following the reforms rather recorded a lethargic inward FDI performance accounting for less than 1% of GDP (UNCTAD, 2003). This situation however picked up, and by the period 1991-1995, Ghana secured its position as one of the top 10 investment locations in Africa. The phenomenal increase in FDI over the said period emanated from the adoption of various FDI friendly policies implemented in the previous years by the government of Ghana in the extractives industry. Key among these policies were the enactment of the Ghana Investment Promotion Centre (GIPC) Act, 1994 (Act 478) within the framework of the Vision 2020, Minerals and Mining Amendment Act, 1994 (Act 475), and the execution of Ghana's premier divestiture program among other programs in the late 1980s which overtly attracted significant amount of FDI into the economy. Others included the investment code (1995) which ultimately eliminated the need for prior project approval, eased company establishment and provided incentives and guarantees to investors. Out of the investment code birthed the *Gateway Strategy* which had the main goal of "attracting a critical mass of export-oriented firms to kick start export-led growth as well as facilitate trade by removing the constraints to the development of exports and investment" (World Bank, 1998).

Ghana finally announced its presence in the international investment market in 1994 when the government partially sold AGC to South African mining firm Lonmin (Arbenser, 2004). Until



2003, the deal was one of Africa's largest privatisation deals and this placed Ghana in the spotlight for international investment as it raked an FDI inflow of US \$233 million into the economy (United Nations, 2003). Other key divestitures in the same decade were those of Accra Breweries and Standard Chartered Bank in 1994 and Telekom Malaysia's acquisition of 30% stake of the defunct Ghana Telecom in 1996.

Ghana's position amongst the top recipients of FDI was short lived as it dropped in its ranks as a top 10 recipient of FDI in the continent and barely made it the ranks of top 20 (UNCTAD, 2002). This was due to the fierce competition for FDI by other developing countries that had comparatively better economic experience at the time. Attempts to further attract more FDI into the economy through the divestiture programs in 1998 proved futile as the country had already either completely or partially divested stakes in its largest banks, mining, manufacturing and service companies. More so, the strained relationship between government and its largest privatized company (Ashanti Goldfields) gravely informed foreign investor perceptions of Ghana's privatization programme. In an attempt to revamp the interest of foreign investors Ghana embarked on various investment missions abroad and hosted major international events that focus on foreign direct investment in Ghana. Key among these events were the 5th African-American Summit and the 3rd Pan African Investment Summit held in May and September 1999 respectively which was meant to generate renewed interest in Ghana.

Following the country's peaceful elections and transfer of power in 2001, the new government declared HIPC and launched the "Golden era of business" which reassured foreign investors about the strong pro-business attitude of the new government and this saw a sluggish increase in FDI inflow into the Ghanaian economy. The sluggish increase was due to the steady decline of FDI at the global front which eventually triggered the low inflows to Ghana.



Generally, the growth of inward FDI to Ghana has been hinged on its stable political terrain and various trade liberalisation policies rolled out by successive governments to attract foreign capital inflow. Though, the year 2004 to 2005 saw a dip of 4.6% in FDI inflows, this subsequently sky-rocketed to 19.4% in 2006 and further to 22.3% in 2007 following the sale of 70% of the government's stake in Ghana Telecom to Vodafone for \$900 million, and the influx of banks and other telecoms. Ghana's hosting of the 2008 African cup of nations football tournament, was also crucial in increasing the nation's investment prospects globally (WorldBank, 2009). Inward FDI in recent times has thus been very pronounced with its all-time highest being recorded in 2010 (contributing to 8.0% of GDP) as a result of the huge amounts of capital requirement needed to facilitate the oil production (World Bank Development Indicators, 2011). With the key focus of successive civilian governments to instil confidence among foreign investors and create an attractive environment for FDI in recent times, Ghana has succeeded in restoring its position as a FDI front runner on the continent. According to UNCTAD's trade policy review (2006) the key factors determining the course of FDI into Ghana include its political and economic stability, and competitive wages.

One apparent feature of the FDI trend in Ghana according to Tsikata et al (2000) is the three-way nexus of economic growth, investment and political stability, since the 1972 coup. For instance, notwithstanding the fact the economy grew at 2.3% in the said year, FDI inflows fell by as much as 60% (from \$30.6 million in 1971 to \$11.5 million in 1972). The second coup in 1979 once again saw economic growth fall to as low as -3.2%; and this saw an outflow of \$2.8 million of FDI outside the country. Subsequent years witnessed an abysmal performance of the economy with a negative growth rate of 3.5% in 1981 to 6.9% in 1982 with FDI inflow surprisingly remaining constant at \$16.3 million (Tsikata, et al., 2000).



The unique feature of Ghana's FDI trend further emerged in 1992 in the switch from military rule to constitutional rule. FDI inflow thus increased from \$20million in 1991 to \$22.5million in 1992. The peaceful transition of political power by the erstwhile Rawlings government after 18 years of rule in 2000 and the change in government in 2008 witnessed similar recurring features in the FDI trend of the economy. The recent case saw a fall in the GDP ..growth rate from 8 % in 2008 to 5% in 2009 and a corresponding fall decline of almost 48% decline in FDI inflows (\$ 2.7 billion in 2008 to \$ 1.4 billion in 2009).

Another loud feature observed under the FDI trend of Ghana is its high association with large government divestiture programs. While the increase of \$16billion in 2007 to \$26 billion in 2008 in FDI inflows in the West African Sub region is precipitated by the upsurge of new projects in Nigeria's oil industry, the role of existing MNCs in upgrading projects – mostly mining industry-in Burkina Faso, Mali and Nigeria the Ghanaian case seem to have taken a different course as it is mostly dependent on large M&A's that took place within the period. For instance, the acquisition of 70% stake in Ghana Telecommunications Co Ltd by the Vodafone Group (UK) for \$900M. (UNCTAD, 2009).

#### **2.4.2.1 Sectorial distribution of FDI Inflows to Ghana**

Generally, the sectorial difference in FDI inflow into the Ghanaian economy is quite apparent with a bulk of it skewed towards the mining sector. A study by Abdulai (2005) to assess the trends and sectorial distribution of FDI flows in Ghana suggests that though a significant share of FDI inflows has come into the banking, telecommunication and oil and gas sectors, FDI is still overly concentrated in the mining sectors of the economy. The mining and services sector attracts a significant portion of the country's FDI due to the mining law and privatization programme in late 1980s and mid 1990s (Abosi, 2008). To this end, over the past two decades,



some 70 percent of total FDI inflows went into the mining sector with the telecommunications and banking industry being the key recipients in the service sector (UNCTAD, 2008).

Geographically, the greater Accra continues to account for the lion's share of FDI flows. This is due to the high concentration of social and other investment infrastructure compared to other regions. Like the capitals of most African developing countries in the sub, as at 2004, Accra accounted for about 79% of total investment projects. The Ashanti region follows with 7%. Western region accounts for 4.4% with the three northern regions cumulatively receiving a meagre 1.36% of total investment projects in the country (GIPC, 2004). For the periods of 2006- 2010, 85% of the projects registered were located in the Greater Accra Region with no project recorded in the Upper West Region for the period under review (GIPC, 2004).

#### **2.4.2.2 Global FDI performance**

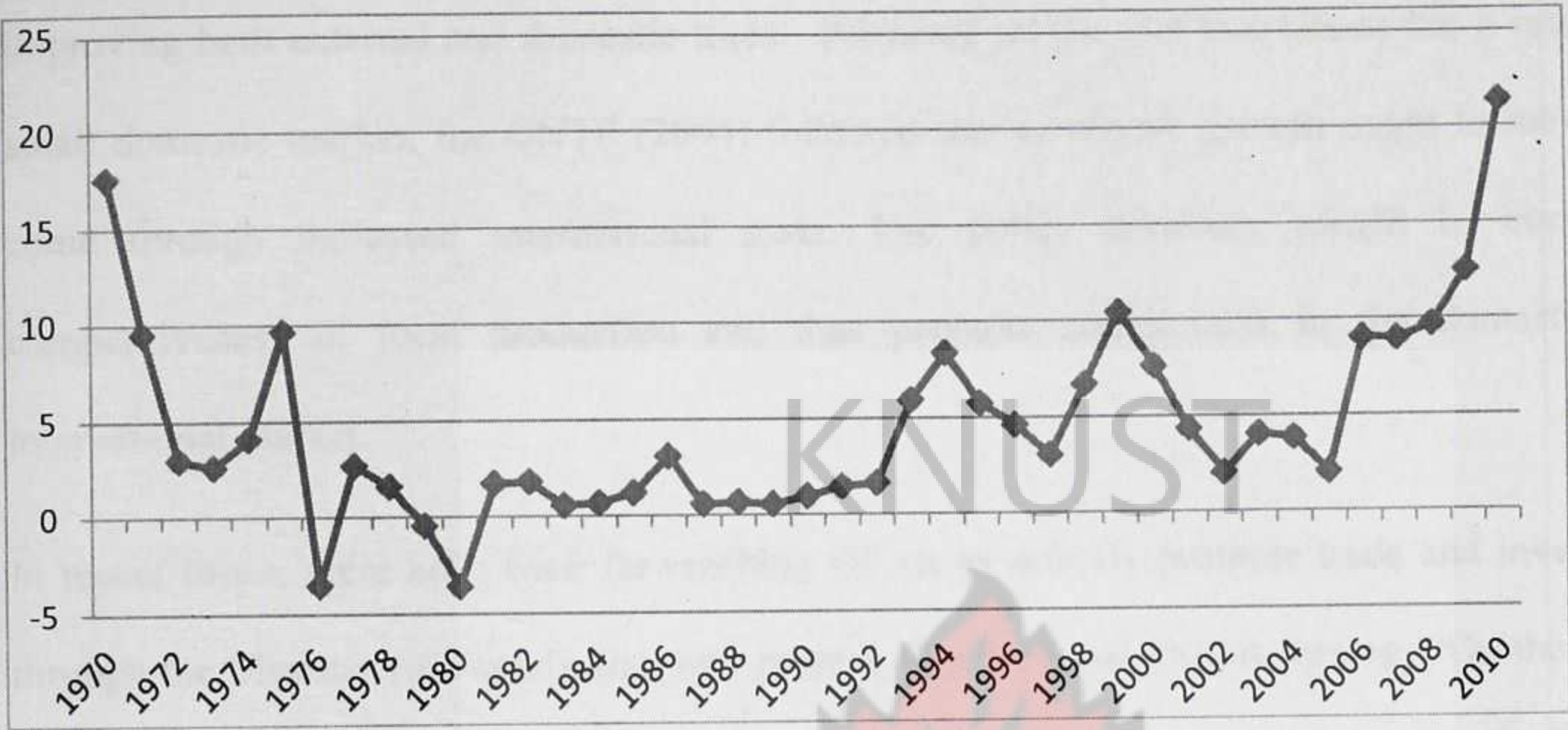
In terms of inward FDI potential index, Ghana ranked 109, 110, 106, 105 and 104 out of 141 countries in 2005, 2006, 2007, 2008 and 2009 respectively. It is however worth noting that the country made significant incursions in the global inward FDI performance index, ranking 86<sup>th</sup> and 62<sup>nd</sup> out of 141 countries in 1990 and 1995 respectively. The nation further rose to the 58<sup>th</sup>, 34<sup>th</sup>, 12<sup>th</sup> and 11<sup>th</sup> in the 2007, 2008, 2009 and 2010 respectively (World Investment Report, 2011).

Despite the phenomenal performance of the economy in the global inward FDI performance index and the absolute inward FDI, Ghana's share of total inward FDI to the economic region is quite low. Since 1970 to 2010, Ghana has attracted on average, only 4.6% of total inward FDI to the region with its all-time highest of 21.4% being recorded in 2010 (figure 2.2). A bulk of the inward FDI still goes to Nigeria. The case of the Ghanaian economy becomes is further exacerbated when compared to sub-Saharan countries or other developing countries in the world. Since 2000, Ghana has attracted only between 0.5 percent and 2 percent of the share of



inward FDI to sub-Saharan African countries. At the global level, Ghana has attracted only between 0.05 percent and 0.1 percent of total FDI to all developing countries (UNCTAD 2008)

Figure 2.2 Inward FDI to Ghana as a percentage of total FDI to ECOWAS countries



Source: Compiled from the UNCTAD 2012 Database

2.4.3 Ghana’s trade performance and policy reforms

Since the economic reforms in the mid 1980’s, trade has consistently played a critical role in the Ghanaian economy contributing significantly to the growth of the economy. With an average contribution of 53% of GDP per annum, the highest and lowest trade values in the Ghanaian economy recorded were 6% and 116% of GDP in 1982 and 2000 respectively.

The promulgation of the ERP in 1983 earmarked the initiation of an era of stabilization and adjustment. Trade policies were quite crucial in the promulgation of the flagship strategies of ERP and SAPs as they encompassed several trade policies such as tariff adjustments, liberalization of foreign exchange and import liberalization (Kraev, 2004). The stimulation of exports for an export-led growth economy was therefore a fundamental target of the programs.

Since the advent of the ERP, a number of development strategies by successive governments have incorporated trade as their overriding objective. Development strategies like the Ghana



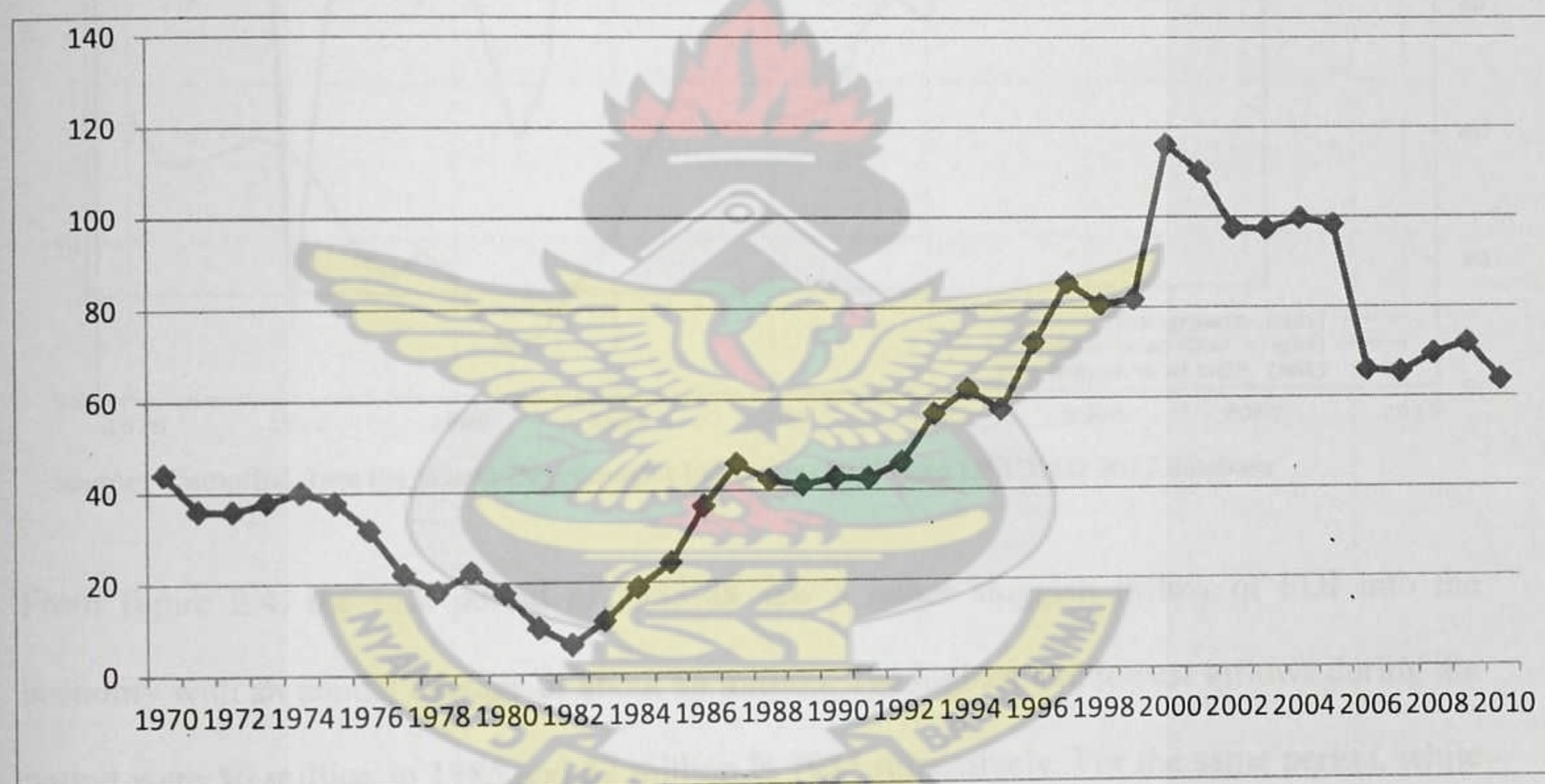
Poverty Reduction Strategy I and II (2003 – 2009) have incorporated “strategies for increasing production and gainful employment” based on inter alia encouraging the development of the trade sector by improving agricultural production, developing marketing channels for agricultural produce and promoting non-traditional exports. Ghana’s Trade Policy (GNTP) which was later translated into the Trade Sector Support Program (TSSP) in 2005 focused on improving both external and domestic trade. Premised on the fact that Ghana has a relatively small domestic market, the GNTP (2004) followed that economic growth ought to inevitably come through increased international trade. The policy therefore sought to boost the competitiveness of local production and thus promote competition in the domestic and international market.

In recent times, there have been far-reaching efforts to actively promote trade and investment through the Ministry of Trade’s Gateway project, The National Export Strategy. On the global scale, Ghana has committed herself self to other international conventions like the African Growth and Opportunities Act (AGOA) in 2000, the Cotonou Agreement between the African, Caribbean and Pacific (ACP) group of States and the EU, the Interim Economic Partnership Agreement (IEPA) in 2007 and the on-going Doha Development Round. This in effects binds the government of Ghana to liberalise its trade policy arrangements in some way. For instance as a member of the Economic Community of West African States (ECOWAS), Ghana has adopted the group’s Common External Tariff (CET) in 2008 for trade arrangements between Ghana and partner countries. As at 2009, the country’s current MFN Tariff Trade Restrictiveness Index (TTRI) was 9.0 percent which is below both the low-income country group and Sub-Saharan Africa (SSA) averages of 11.6% and 11.3%, respectively, thus reflecting a relatively more open trade regime. Ghana therefore ranked 89th of 125 countries (where 1st is least restrictive).



On the whole, Ghana's import still far outstrips exports and the export market is still dominated by primary commodities, namely gold and cocoa. The country's terms of trade declined rapidly between 1989 and 1993 as a result of falling gold and cocoa prices and stabilised till 1996. After 1996, the terms of trade has been worsening by the year with the annual average share of external trade balance (exports minus imports) in GDP adversely increasing from -12.4% to -17.5% from the periods of 1990-99 to 2000-09. The periods of 2003 to 2011 recorded an average trade deficit of US \$ 688.4 million per annum with a record low of US\$ 1604.3 million being registered in September of 2008 (World development Indicators, 2011).

**Figure 2.3 Trade openness in the Ghanaian economy from 1970 to 2010**



Source: Compiled from the UNCTAD 2012 Database

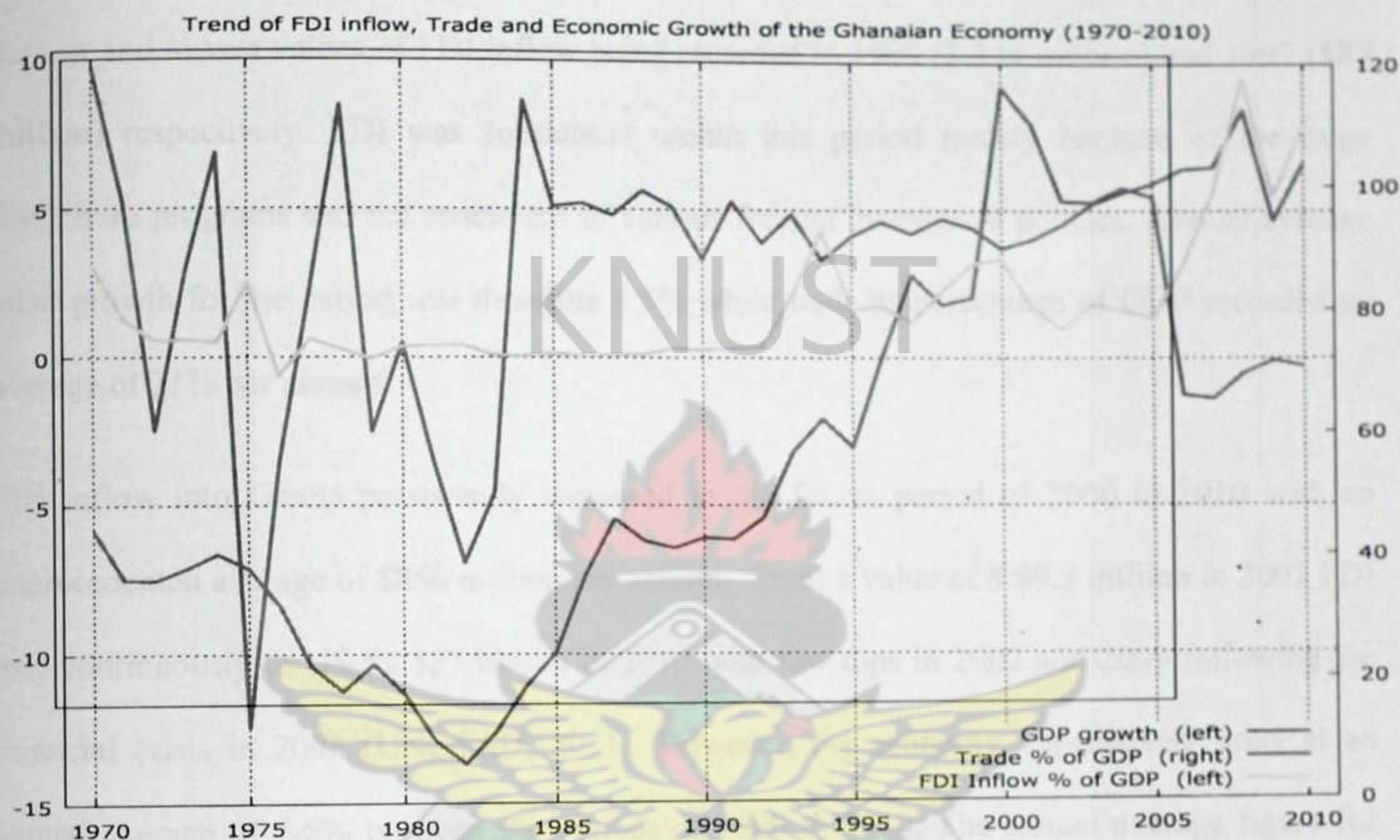
#### 2.4.4 Ghana's inward FDI, trade and growth statistics.

Following Tsikata et al (2000), the historical trend of FDI, trade and economic growth can be divided into three main phases. The first phase (1983-1988) which was characterized by sluggish inflows, the second phase (1989-1992) which had moderate inflows and the third period which was post constitutional rule which saw huge influx of FDI. Due to the availability



of data, a fourth period which captures the periods of 2000 to 2010 which witnessed an unprecedented persistent increase in FDI inflows into the country and subsequently improved the image of the Ghanaian economy in the international financial markets would be included.

**Figure 2.4**



Source: Compiled from the World Development Indicators (2011) and UNCTAD 2012 database

From figure 2.4, the first period of 1983-88 saw a rather sluggish inflow of FDI into the economy with an annual average of about \$4 million. The highest and lowest inflows during the period were \$6 million in 1985 and \$2 million in 1984 respectively. For the same period, while the annual average FDI as a percentage of GDP was 0.08%. That of trade as a percentage of GDP was 30% while the economy grew at an average of 4.1% per annum.

The second period which Tsikata et al (2000) described as the moderate FDI inflow period recorded an average of about \$18 million per annum (0.3% of GDP) with the highest and lowest inflows of \$23 million in 1992 and \$14.8 million in 1990 respectively. Trade as



a percentage of GDP for the same period recorded an average of 43% per annum whereas the economy grew at an annual average of 4.4%.

The immediate periods after constitutional rule which was the third period had significant but oscillatory inflows of FDI. The period witnessed an annual average of 135 \$million with the highest and lowest values of FDI inflow being recorded in 1999 (\$ 244 million) and 1997 (\$82 million) respectively. FDI was substantial within this period mainly because of the huge divestiture programs and the enactment of various foreign investment policies. Annual average GDP growth for the period was therefore 4.3% while trade as percentage of GDP recorded an average of 71% per annum.

FDI inflow into Ghana persistently increased in the fourth period of 2000 to 2010 with an unprecedented average of \$856 million per annum. From a value of \$ 89.3 million in 2001 FDI rose continuously to US \$2.527 billion in 2010 with few dips in 2002 and 2009 following the financial crisis in 2008 (UNCTAD, 2011). However, the economy impressively grew at an annual average of 5.6% between the periods of 2000 to 2010. The annual average figure for trade as a percentage of GDP for the same period was 87% indicating the high rate of trade liberalisation in the Ghanaian economy.

Table 2.1 Summary of FDI, trade and economic growth data for Ghana (1970-2010)

|                        | 1970-82 | 1983-88 | 1989-92 | 1993-99 | 2000-10 |
|------------------------|---------|---------|---------|---------|---------|
| GDP growth rate (%)    | 0.35    | 4.1     | 4.4     | 4.3     | 5.6     |
| FDI net inflow (% GDP) | 0.74    | 0.08    | 0.3     | 2.3     | 3.8     |
| Trade (% GDP)          | 28      | 30      | 43      | 71      | 87      |

Source: World Bank, 2012 World Development Indicators. The data on FDI inflows are from UNCTAD



## CHAPTER THREE

### METHODOLOGY

#### 3.1 Introduction

The chapter briefly discusses the methodology employed under this study. Highlights under the chapter include the types and sources of data, the theoretical and econometric frameworks, and an in-depth overview of the estimation procedures as well as justification of the variables used.

#### 3.2 Model specification

Economic growth theory by way of neoclassical growth and endogenous growth models allow us to identify key variables that influence the growth of any economy within the framework of the aggregate production functions. Following Kohpaiboon (2004), Mansouri (2005), Frimpong and Oteng-Abayie (2006), Herzer et.al (2006), Abdullah et.al (2009) and Kargbo (2012) the study adopts the aggregate production function (APF) approach as its theoretical framework. The baseline APF model is stated in equation (3.1)

$$Y_t = A_t K_t^\alpha L_t^\beta \quad (3.1)$$

where  $Y$  is real GDP,  $A$  is total factor productivity, and  $L$  and  $K$  are labour and capital respectively. Following the assumptions of Lipsey (2001) and Bhagwati (1985), it can be concluded that the impact of FDI on economic growth operates through  $(A_t)$  and  $(A_t)$  in turn depends on the trade policy regime. FDI and trade thus impact on economic growth through  $A_t$ . Implying that  $(A_t)$  is a function of FDI and trade ( $TRP$ ) as in equation (3.2) below

$$A_t = g(FDI, TR, FDI * TR) \quad (3.2)$$

Substituting equation (3.2) into equation (3.1) yields the equation below.

$$Y_t = F(K_t, L_t, FDI_t, TR_t, FDI_t * TR_t) \quad (3.3)$$



In an effort to capture the impact of economic liberalisation regimes and the political environment on economic growth a dummy variable  $D_t$  and a polity variable  $Pol$  are included in the model. The resulting equation being:

$$Y_t = F(K_t, L_t, FDI_t, TR_t, D_t, Pol, FDI_t * TR_t) \quad (3.4)$$

Taking the natural logs of both sides of equation (4) above yields the specified model below:

$$\ln Y_t = \beta_0 + \beta_1 K_t + \beta_2 \ln L_t + \beta_3 FDI_t + \beta_4 TR_t + \beta_5 D_t + \beta_6 Pol_t + \beta_7 FDI * TR_t + \varepsilon_t \quad (3.5)$$

where the  $\beta_s$  are the parameters to be estimated,  $\varepsilon_t$  represents the error term,  $Y_t$  is real GDP,  $K_t$  is the capital stock, which is proxied by the share of gross domestic investment in GDP,  $FDI_t$  is the value of real gross foreign direct investment flows as a share of GDP,  $D_t$  is the dummy variable for economic liberalization,  $Pol_t$  measures the political system and  $FDI*TR$  represents the FDI-trade interaction as measured by the product of  $FDI$  and  $TR$ .  $\ln$  is the natural logarithmic operator.

### 3.3 Data type and sources

The study makes extensive use of secondary data since it is accurate for the analysis and readily available, thus making it convenient to use (Ghauri, et al., 2002). The key variables used for the analysis includes real GDP, FDI inflow, volume of total labour force, the real value of gross domestic investment, trade openness and the polity2 score obtained from Polity IV index. The data for FDI was sourced from the UNCTAD database. The rest of the data are sourced from the World Bank's Development Indicators (2011).

To examine the relationship between FDI, trade and growth, annual time series data spanning the periods 1970-2010 for which data is available is used. Thus the sample size will be forty-one (41) years. The period of study has the advantage of obtaining adequate degrees of



freedom for the analysis since it is long enough to adequately account for the various trade and investment policy reforms in the early 1980s, the torrential floods of FDI inflows in recent times, the global financial crisis, the oil discovery process and the fast paced economic growth of Ghana inter alia key economic events. Furthermore, there is availability of data for the variables of interest. Given the fact that the ARDL technique is adopted for the study, the Microfit statistical package (version 5.0) was therefore used for the analysis.

### 3.4 Justification and definition of variables

- **Economic Growth ( $Y_t$ )**

Economic growth is basically defined as the growth in the total or per capita output of an economy often measured by an increase in real GDP and caused by an increase in the supply of factors of production or their productivity (Rutherford, 2002). Economic growth can also be implied as an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. Though variables like real output per capita and growth in real gross domestic product can be used to measure economic growth, this study would proxy economic growth with growth in real GDP. The choice of this variable is hinged on the fact that it is widely recognised as a good measure of the economic value of a nation's output and income. It is also a key objective for development economists as it inherently accounts for impact of inflation on the total value of goods and services in an economy. To this end, the real GDP variable will be the dependent variable in the model.

- **Gross domestic investment ( $K_t$ )**

Since physical capital stock is widely regarded as a critical factor in the production process on both theoretical and empirical grounds, the framework of an aggregate production function depicts quality capital as both a condition and a consequence of economic growth (Mincer, 1981). In other words, in as much as quality capital is key to the economic progress of any



economy, the quality of capital tends to improve as a result of economic growth through innovation. A rise in a nation's capital investments thus directly impacts on its GDP in the sense that higher capital accumulation by way of investments invariably increases capital per worker and this embodies technological improvements, acquisition of sufficient skills and training to efficiently use new capital inputs. This would consequently lead to a higher level of productivity after a time lag.

Following from previous empirical works, this study will proxy the amount of capital stock with the Real GDP as a percentage of GDP in an attempt to avoid double counting (Kumar & Pradhan, 2002; Nath, 2005; Adams 2009). In that regard, FDI net inflows are subtracted from gross fixed capital formation to calculate gross domestic investment in the economy. This is because gross fixed capital formation embodies FDI inflows and therefore it is not theoretically prudent to use it in addition to the FDI variable in the model. More so, the inclusion of this variable helps examine the impact of domestic investment on the economy. Since both theoretical and empirical evidence suggest a positive relationship between economic growth and capital stock, the coefficient of gross domestic investment is expected to be positive (Romer, 1986; Lucas, 1988; Rebelo, 1991; Hoover and Perez, 2004).

- **Labour force ( $L_t$ )**

The size and quality of the labour force is very critical in the assessment of any country's potential economic growth model. Labour force is the total labour stock or currently active population of all persons who fulfil the requirements for inclusion among the employed or unemployed during a specified period (Shim et al., 1995). Total labour force thus comprises people of ages 15 and older who meet the International Labour Organization definition of the economically active population: all people who supply labour for the production of goods and services during a specified period. It therefore includes both the employed and the unemployed.



Theoretically, the classical growth model suggests a positive relationship between economic growth and the stock of productive labour in any economy. The stock of labour force in a host country is crucial for absorbing foreign knowledge and a critical determinant of whether potential spill overs will be realized (Karbasi et al 2007). Ceteris paribus, the higher the labour force, the higher the supply of labour and hence, output (Todaro, 2006). Thus on theoretical grounds, the variable ought to be included in the model so as to avoid misspecification error. Stock of labour is expected to be positively correlated with real GDP per capita, therefore its coefficient is expected to be positive.

- **Foreign Direct Investment ( $FDI_t$ )**

According to Shim et.al (1995), foreign direct investment refers to long term participation by country "A" in management, joint venture, transfer of technology and expertise in country "B". It is also the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It therefore embodies the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments (World Development Indicators, 2011). For the purposes of this study and to maintain some level of consistency in the data used, the FDI time series will depict that of net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors as a percentage of GDP.

FDI is particularly relevant in the economic growth model due to the crucial role it plays in the economy of developing countries for which the Ghanaian economy is no exception. FDI augments domestic investment by serving as a source of the capital, technology, managerial skills and market access needed to propel developing countries towards economic growth and development. Empirical evidence therefore suggests a positive relationship between FDI



and economic growth (Obwona, 2001; Frimpong and Oteng-Abayie, 2006; Abdullah et.al, 2009 and Kargbo, 2012). To this end, the coefficient of FDI is expected to be positive.

- **Trade openness ( $TR_t$ )**

Trade openness is usually defined as the sum of exports and imports of goods and services measured as a share of gross domestic product. A high trade openness value reflects a high incidence of trade, which implies high volumes of exports and imports as well as relatively low trade barriers of the country. The goods and services traded are sometimes in the form of inputs and outputs of FDI related projects. This implies that while high trade openness is relevant to export oriented FDI, import-substitution FDI also gains from lower trade barriers against imported inputs (Wilhelm et. al, 1998). Thus, the growth-enhancing effects as well as magnitude of FDI is highly dependent on the incentives offered by the recipient country through its trade policies which is eventually represented in its trade openness values (Bhagwati, 1978). This explains the relevance of the trade openness variable to the economic growth model of Ghana that has implemented both export oriented and import substitution trade policies in the past. To this end, the coefficient of trade openness is expected to be positive. High trade volume is particularly important to export-oriented FDI. While import-substitution FDI gains from trade barriers against competing imported products, it benefits from low trade barriers against imported inputs.

- **Economic liberalisation ( $D_t$ )**

The economic liberalisation dummy variable control for period-specific effects of the trade regimes in Ghana (for  $D = 1$  from 1969-1972 and 1983-2010;  $D = 0$  from 1973-1982).. Though empirical literature like that of Magnus and Oteng-Abayie (2006) found economic liberalisation to be highly statistically insignificant in their growth model that of Aryeetey and Fosu, (2005) points to the positive and significant role for the periods of 1969 to 1996.



- **Political liberalisation**

In addition to the independent variables discussed, the model controls for the political environment of the economy as this has a bearing on the quantity and efficacy of FDI in an economy. Therefore a measure of political risk is included in the model. The variable therefore measures the extent of autocracy or democracy in a country and it ranges from -10 (strongly autocratic) to +10 (strongly democratic).

### **3.5 Estimation procedure**

#### **3.5.1 Unit root tests**

Given the fact that all macroeconomic data acquired for the study are time series, there is the possibility of non-stationarity of the variables. Therefore as a first step in the estimation process, the study tested for the stationarity of the endogenous and exogenous variables within the framework of Augmented-Dickey-Fuller (ADF) test procedure (Dickey and Fuller, 1979), Philips-Perron (1988) and the Augmented Dickey Fuller-GLS test (Elliot, Rothenberg and Stock, 1996). This is in an attempt to holistically ascertain the stationarity of each of the variables. A variable is considered stationary if its mean and variance are constant over time and the covariance between the two time periods depends only on the distance between the two time periods and not the actual time at which the covariance is computed. Unit root tests are meant to avoid a spurious regression, which is a common problem with macroeconomic time series data (Gujarati, 2007). In addition, it is a pre-requisite for testing long run relationship between two or more time series data as well as Granger causality tests (Engle and Granger, 1987). The (ARDL) bounds test technique for instance requires that the variables to be considered are not integrated of order more than 1 and the unit root tests helps confirm this. To this end, the stationarity properties of each of the variables under consideration were tested with and without a time trend and intercept. The automatic lag length selection per the Schwarz Bayesian



Criterion (SBC) and the Newey-West bandwidth with a maximum lag length of 9 were employed for the ADF and Philips-Perron tests respectively.

The hypotheses to be tested are:

$$H_0: \gamma = 0 \text{ (not stationary and has a unit root)}$$

$$H_1: \gamma \neq 0 \text{ (stationary and has a no unit root)}$$

In the context of the ADF test, if the calculated ADF test statistic is greater than the MacKinnon critical values, the null hypothesis ( $H_0$ ) is rejected which implies that the variable under consideration is stationary and integrated of order zero, that is,  $I(0)$  otherwise accept  $H_0$  which implies that the series in question is not stationary (Gujarati, 2004). Similarly, the corresponding probability values generated for the test statistics would guide outcome of the Philips Perron and the Augmented Dickey Fuller-GLS tests.

### 3.5.2 The ARDL bounds test approach

Having established that the time series properties of each of the variables in the specified model are integrated of order zero or one, the study further tested for cointegration among the variables of interest. From the related literature a number of methods were applied. Common among these techniques are the residual based Engle-Granger (1987) test, Johansen (1988), Johansen-Juselius (1990) and Gregory and Hansen (1996). In recent times however, autoregressive distributed lag (ARDL) approach, developed by Pesaran and Shin (1995 and 1998), Pesaran et al. (1996) and Pesaran et al. (2001) has gained prominence. Since the Engle-Granger (1987) approach is limited to a bivariate model and hence not appropriate for models constituting more than two variables, this study will adopt the autoregressive distributed lag (ARDL) bounds technique meticulously investigate the longrun run relationships between the variables under consideration.



As already established, the autoregressive distributed lag (ARDL) bounds test technique which was developed by Pesaran et. al (2001) will also be adopted for the cointegrations tests. The choice of this method of analysis was borne from the fact that it is relatively simple and thus allows for the estimation of cointegration relationship using the ordinary least square (OLS) methods. Secondly, unlike the conventional Johansen ML test, this technique is capable of testing for the existence of a long-run relationship irrespective of whether the variables are of different order of integration (Pesaran and Pesaran 1997). The approach is relatively flexible since it invariably avoids the Augmented Dicky Fuller unit root and autocorrelation function tests for testing the order of integration. Further more it is more efficient in finite and small sample study and applicable even in the case where the regressors are endogenous (Haug, 2002). Indeed, Banerjee et al. (1993) confirms that the attractiveness of ARDL approach when carrying out cointegration in small samples is the fact that it is more efficient than other vector autoregressive (VAR) methods. This is further endorsed by Pesaran and Shin (1999) and Pesaran, et al. (2001). Finally, it further allows for unrestricted number of lags for both the dependent and independent variables (Pesaran et. al 2001).

Under the assumption that there exist longrun relationships among the variables, the vector error correction model (VECM) can be specified as;

$$\begin{aligned} \Delta \ln Y_t = & \beta_0 + \beta_1 \ln Y_{t-1} + \beta_2 K_{t-1} + \beta_3 \ln L_{t-1} + \beta_4 FDI_{t-1} + \beta_5 TR_{t-1} + \beta_6 Pol_{t-1} + \beta_7 FDI*TR_{t-1} \\ & + \sum_{i=1}^q \beta_8 \Delta \ln Y_{t-i} + \sum_{i=0}^{q_1} \beta_9 \Delta K_{t-i} + \sum_{i=0}^{q_2} \beta_{10} \Delta \ln L_{t-i} + \sum_{i=0}^{q_3} \beta_{11} \Delta FDI_{t-i} + \sum_{i=0}^{q_4} \beta_{12} \Delta TR_{t-i} + \sum_{i=0}^{q_5} \beta_{13} \Delta Pol_{t-i} \\ & + \sum_{i=0}^{q_6} \beta_{14} \Delta FDI*TR_{t-i} + \beta_{15} D_t + \varepsilon_t \end{aligned} \quad (3.6)$$

where  $\beta_1$  to  $\beta_7$  are the long run multipliers,  $\beta_0$  is the drift,  $\beta_8$  to  $\beta_{14}$ ,  $q$  and  $p$  are the order of lags and  $\varepsilon_t$  are white noise errors which are independent and identically distributed (iid) and all



other variables are as previously defined. All the variables are expressed in their natural logarithms and it can be viewed as an ARDL of order (q, q<sub>1</sub>, q<sub>2</sub>, q<sub>3</sub>, q<sub>4</sub>, q<sub>5</sub>, q<sub>6</sub>, q<sub>7</sub>).

- **Bounds testing procedure**

The ARDL bounds testing procedure fundamentally involves testing for cointegration, estimating the long run model and then finally estimating the error correction model.

The first step in the technique requires establishing the existence of a long-run relationship among the variables by estimating equation (3.6) by the ordinary least squares (OLS) method and conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables. In that regard, the null and alternative hypotheses to be tested are:

$$H_0 : \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0 \quad (\text{no long-run relationship})$$

$$H_1 : \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0 \quad (\text{long-run relationship})$$

More so, we denote the test which normalizes on real GDP by [ $F_y (Y|L, K, FDI, TR, POL, D, (FDI*TR))$ ]. After the estimation of the model, the computed F –statistic is then compared to the simulated critical F-values generated by the the Microfit 5.0 statistical package.

Since the lower bound critical values assume that the variables are I(0), whereas the upper critical values assume that the explanatory variables are I(1)), the null hypothesis is rejected if the computed F-statistic is greater than the upper bound value. This implies a long-run relationship between the variables. On the other hand, if the computed F- static is less than the lower bound value, then we accept the null hypothesis and conclude that there is no long-run relationship between the variables. If however, the computed F-statistic falls between the lower and upper bound value the results becomes ambiguous and in this case, more information will be required to arrive at a conclusive inference (Pesaran et al., 2001). Also, following Kremers et



al. (1992) and Bannerjee et al. (1998) the error correction term will be a useful way of establishing cointegration.

Once the long run relationship between the variables has been established, the long run model for  $Y$  can then be estimated as:

$$\ln Y_t = \beta_0 + \beta_1 \ln Y_{t-1} + \beta_2 K_{t-1} + \beta_3 \ln L_{t-1} + \beta_4 FDI_{t-1} + \beta_5 TR_{t-1} + \beta_6 Pol_{t-1} + \beta_7 FDI*TR_{t-1} + \beta_8 D_t + \varepsilon_t \quad (3.7)$$

where all variables are as previously defined and  $\beta_i$  is the long run parameters. The final step involves estimating the error correction in equation (3.8) to generate the short run dynamic parameters.

$$\begin{aligned} \Delta \ln Y_t = & \delta_0 + \sum_{i=1}^q \delta_1 \Delta \ln Y_{t-i} + \sum_{i=0}^{q_1} \delta_2 \Delta K_{t-i} + \sum_{i=0}^{q_2} \delta_3 \Delta \ln L_{t-i} + \sum_{i=0}^{q_3} \delta_4 \Delta FDI_{t-i} \\ & + \sum_{i=0}^{q_4} \delta_5 \Delta TR_{t-i} + \sum_{i=0}^{q_5} \delta_6 \Delta Pol + \sum_{i=0}^{q_6} \delta_7 \Delta FDI*TR_{t-i} + \delta_8 D_t + \psi ecm_{t-1} + \varepsilon_t \end{aligned} \quad (3.8)$$

where all variables are as previously defined and  $\delta_i$  are the short-run dynamic coefficients, and  $\psi ecm_{t-1}$  is the speed of adjustment to restore equilibrium in the dynamic model following a disturbance. The ecm coefficient shows how slowly/quickly variable returns to equilibrium and it is expected to be negative and significant in this context.

Since the ARDL model is estimated by OLS, it is imperative to test if the model satisfies the classical assumptions of least squares. To this end, diagnostic and stability tests is further conducted in the ARDL framework to assess the goodness of fit of the model. The diagnostic results generated from the Microfit 5.0 output for the ARDL estimations is then used to test for the presence of heteroscedasticity, serial correlation, normality and functional form of the model under consideration. This is in a bid to ascertain the adequacy of the model as well as its predictive power. The cumulative sum of recursive residuals (CUSUM) and the cumulative sum



of squares of the recursive residuals (CUSUMSQ) tests by Brown et al., (1975) is then used in the stability tests of the regression parameters within the 5 percent critical bounds.

- **Granger causality test**

In line with the objectives of the study, granger causality tests is also done to assess the causal relationship between the variables. Since regression analysis only deals with the dependence of one variable on other variables it does not necessarily imply causation or prediction (Gujarati, 2007). This study adopts the widely used Granger causality test to assess the presence and the direction of causality between the variables under consideration. The direction of causality determines the direction of the relationship among variables. In that regard, there might be one-way causality, two-way causality or no causality between the variables.

The Granger causality test states that, if a variable  $x$  Granger causes variable  $y$ , the mean square error (MSE) of forecast of  $y$  based on the past values of  $x$  are lower than that of a forecast that uses only past values of  $y$ . To test for causality between FDI inflows, trade and economic growth, the traditional Granger-type causality developed by Granger (1988) tests will be used to identify the direction of causality.



## CHAPTER FOUR

### ANALYSIS AND DISCUSSION OF EMPIRICAL RESULTS

#### 4.0 Introduction

This chapter presents and analyses the empirical results of the study. The chapter is organised into three broad sections. The first section discusses the time series properties, and the tests for cointegration. Section two critically elucidates the results of the estimated long run and the error correction model (ECM) for the selected ARDL models. Using the objectives and hypothesis of the study as a hindsight, the last section investigates the causal relationships that exists between the variables of concern. The chapter concludes with the discussion and summary of the results.

#### 4.1 Discussion of time series properties

##### 4.1.1 Results of unit root test

Following the basic tenets of econometric theory, it is indeed trite knowledge that there is a high possibility of non-stationarity in macroeconomic time series data. More so, the ARDL bounds test requires that none of the variables are integrated of order more than 1 beyond which the bounds test to cointegration is not valid. Therefore as a first step in the estimation process, the study investigated the stationarity properties of both endogenous and exogenous variables. The tests was done within the framework of Augmented-Dickey-Fuller (ADF) test procedure (Dickey and Fuller, 1979), Phillips-Perron test (Phillips and Perron, 1988) and the Augmented Dickey Fuller-generalised least square (GLS) test (Elliot, Rothenberg and Stock, 1996) Each of the variables was thus tested in the levels and in the first difference forms as well as with and without a time trend. The automatic lag length selection per the Schwarz Bayesian Criterion (SBC) and the Newey-West bandwidth with a maximum lag length of 9 were used for the ADF and Philips-Perron tests respectively. Table 4.1 presents the results of the unit root tests for each of the variables.



Table 4.1 Results of the unit root tests

(a) Augmented-Dickey-Fuller (ADF) unit root tests on variables

|               | Levels    |                   | First difference |                  |
|---------------|-----------|-------------------|------------------|------------------|
|               | Intercept | Intercept + trend | Intercept        | Intercept+ trend |
| <i>LnRGDP</i> | 1.9121    | -4.133**          | -4.408***        |                  |
| <i>GDI</i>    | -4.662*** | -4.553***         |                  |                  |
| <i>LnL</i>    | 0.226     | -1.850            | -6.591***        | -6.607***        |
| <i>FDI</i>    | -0.758    | -2.016            | -8.064***        | -8.470***        |
| <i>TR</i>     | -1.513    | -1.796            | -6.560***        | -7.060***        |

\* (\*\*) [\*\*\*] denotes rejection of the null hypothesis of unit root at 10% (5%) [1%] significance level. All results are obtained using E-views 7.0 econometric package.

(b) Philips-Perron (PP) Unit Root Tests on Variables

|               | Levels    |                   | First difference |                  |
|---------------|-----------|-------------------|------------------|------------------|
|               | Intercept | Intercept + trend | Intercept        | Intercept+ trend |
| <i>LnRGDP</i> | 2.365     | -0.816            | -4.408***        | -6.344***        |
| <i>GDI</i>    | -4.617*** | -4.504***         |                  |                  |
| <i>LnL</i>    | 0.226     | -1.814            | -6.593***        | -6.604***        |
| <i>FDI</i>    | -0.757    | -1.742            | -8.094***        | -9.993***        |
| <i>TR</i>     | -1.257    | -1.796            | -6.560***        | -7.379***        |

\* (\*\*) [\*\*\*] denotes rejection of the null hypothesis of unit root at 10% (5%) [1%] significance level. All results are obtained using E-views 7.0 econometric package.



**(c) Augmented Dickey Fuller-GLS (DF-GLS) Unit Root Tests on Variables**

|               | Levels    |                   | First difference |                  |
|---------------|-----------|-------------------|------------------|------------------|
|               | Intercept | Intercept + trend | Intercept        | Intercept+ trend |
| <i>LnRGDP</i> | 1.551     | -1.176            | -4.260***        | -5.193***        |
| <i>GDI</i>    | -3.412*** | -4.341***         |                  |                  |
| <i>LnL</i>    | 1.515     | -1.764            | -6.676***        | -6.673***        |
| <i>FDI</i>    | -0.995    | -2.053            | -7.519***        | -8.135***        |
| <i>TR</i>     | -1.393    | -1.771            | -6.676***        | -6.792***        |

\* (\*\*) [\*\*\*] denotes rejection of the null hypothesis of unit root at 10% (5%) [1%] significance level. All results are obtained using E-views 7.0 econometric package.

From the second and third columns of Table 4.1, it is quite evident that with the exception of gross domestic investment (*GDI*) which is found to be stationary at 1% significance level, none of the variables estimated in their levels was found to be stationary in any of unit root tests. Thus generally, with the exception of gross domestic investment, all the other variables under consideration are integrated of order one or higher. In other words, at the levels, the null hypothesis of non-stationarity was not rejected for all other variables of interest except for gross domestic investment. This result is generally consistent with all unit root tests. Implying that gross domestic investment (*GDI*) is indeed integrated of order zero, i.e  $I(0)$ .

It must however be noted that, the dependent variable (*lnRGDP*) with time trend was also found to be stationary at the levels within the framework of the ADF test. The Philips-Perron(PP) and the Augmented Dickey Fuller-GLS (DF-GLS) however proved otherwise. This conflict was expected hence the adoption of alternative unit root tests so as to holistically ascertain the stationarity of variables. Upon first differencing all the other variables of interest, stationarity was attained. Thus given that all the other variables became stationary after the first differencing, the implications are that they are integrated of order one, i.e  $I(1)$ .



In light of the outcome of the unit root tests, it can thus be concluded that the key condition of stationarity of variables prior to the application to the ARDL bounds cointegration approach have been duly satisfied.

#### 4.1.2 Results of the ARDL (bounds) test for cointegration

Having established that the time series properties of each of the variables in the specified model are integrated of order  $I(0)$  and  $I(1)$ , as a next step, the study investigated the existence of a stable and non-spurious, cointegration relationship among the included variables over the sample period. In that regard, the study adopted the autoregressive distributed lag (ARDL) bounds test technique.

As a first step in applying the ARDL bounds test approach, one has to establish the existence of long-run relationship among variables. Cointegration is therefore expected if the long-run coefficients of all lagged level variables are found to be jointly significant (Pesaran *et al.*, 2001). The F-test statistic being the appropriate statistic is therefore adopted in the test of the null hypothesis of no cointegration.

Table 4.2 presents the results of the estimated bounds test cointegration analysis when real GDP is normalised  $[F_y, (Y|L, K, FDI, TR, POL, D)]$  on the key independent variables. Model I which is ARDL (1, 3, 0, 0, 2, 3) presents the basic specified model with the explanatory variables of, labour, domestic investment, FDI and trade while controlling for the political as well as the economic liberalisation regimes. Model II thus ARDL (1, 3, 0, 0, 0, 3, 0) on the other hand builds on model I by including the interaction of FDI with trade openness. The test results are arrived at after comparing the computed F-statistic of the model with the upper and lower bound values that were constructed based on stochastic simulations using 20000 replications. The findings suggest that the computed F-statistics of 10.298 and 4.4352 are greater than their corresponding upper bound critical values in models I and II respectively. This implies the



rejection of the null hypothesis of no cointegration for both model I and II at 5% and 10% significance level respectively. This indicates that there is enough evidence to substantiate the existence of a unique, non-spurious and stable long run relationship between FDI net inflows, trade and economic growth in the Ghanaian economy for the periods of 1970 to 2010.

**Table 4.2 Results of ARDL bounds test (Model I and II)**

| Model                    | I        | II      |
|--------------------------|----------|---------|
| F-statistic              | 10.298** | 4.4352* |
| 5% Critical Bound Value  |          |         |
| Lower                    | 3.398    | 3.199   |
| Upper                    | 4.680    | 4.537   |
| 10% Critical Bound Value |          |         |
| Lower                    | 2.877    | 2.655   |
| Upper                    | 4.020    | 3.8724  |

\* (\*\*) [\*\*\*] denotes rejection of the null hypothesis of no cointegration at 10% (5%) [1%] significance level. Critical Bounds are constructed by stochastic simulations using 20000 replications. All results are obtained from Microfit 5.0 econometric package.

### 4.2 Results of the long run ARDL model

Once there is absolute certainty of the existence of a stable and non-spurious, cointegration relationship among the variables over the sample period the study further proceeded to estimate the long run parameters of the ARDL specification. As already established in the previous chapter, the long-run ARDL model was estimated based on the Schwarz Bayesian Criterion (SBC) since it is a more parsimonious specification. Moreover the relatively small sample data in this study reinforces this choice (Pesaran and Smith, 1998).



Result from the long run estimations of both models as presented in Table 4.3 show that the estimated coefficients are in line with theoretical and hypothesised priori expectations albeit not all the estimates were statistically significant.

The coefficient of the gross domestic investment (*GDI*) in line with theoretical expectations was found to be positive and highly statistically significant at 1% significance level in both models. The realised long run coefficient of 0.0440 and 0.4693 in models I and II respectively suggests that *ceteris paribus*, an unit increase in gross domestic investment will induce an increase of 4.40% and 46.93% in real GDP for models I and II respectively. It can therefore be deduced that in general, domestic investments have a positive impact on real GDP in Ghana; however the impact is relatively higher when the interaction of FDI and trade is included in the model. Implying that substantial increases in the domestic investment orchestrated by the citizens of the Ghanaian economy are critical to the long term growth and development of the economy. Interestingly, this result is congruent with the classical theories of growth and concurs with the result obtained by Aryeetey and Fosu (2005), Frimpong and Oteng-Abayie (2006) and Adams (2009).

The results of the study further revealed a positive and significant relationship between the labour force and economic growth in Ghana for the period under study. The results goes to suggests that all things being equal, a percentage increase in the labour force of the Ghanaian economy will cause real GDP to increase by 0.2931% approximately in model I and a percentage increase of 0.3548% in model II (i.e. in the presence of the interaction term). This result was expected given the ubiquity of labour intensive method of production in the Ghanaian economy. The inference therefore is that the size of the labour force is crucial in spurring economic growth in Ghana and therefore cannot be undermined as long as talks about the development of the economy is concerned. The results realised was not only in tandem with



theoretical precepts but consistent with the findings of such works as Danquah (2006). Other related works like that of Aryeetey and Fosu (2005) and Frimpong and Oteng-Abayie (2006), were at poles apart with the findings of this study with respect to this variable.

In another development and in line with theoretical expectations the coefficient of the FDI net inflow variable was found to exhibit a positive but statistically insignificant impact on real GDP of the Ghanaian economy in model I. The results obtained upon estimating model I indicate that an increase in FDI inflows could trigger a real GDP growth of approximately 0.32% though not significant. Obviously, it is expected that per the modernisation theories of FDI, a rise in FDI inflows into a developing economy, goes to finance saving gaps, introduce superior cutting-edge technology and managerial skills which ultimately impacts positively on the recipient economy. Sadly, this is loosely the case of the Ghanaian economy.

Unlike the results for model I, that of model II reveals a rather contentious outcome which clearly contravenes the economic theoretical expectations. The results in Table 4.3 suggest that all other things remaining the same, an increase in FDI could rather accounts for approximately 22% fall in real GDP. Thus FDI has a negative impact on growth, albeit its coefficient was not statistically different from zero at 10% level of significance. This inverse relationship between FDI and real GDP realised from the analysis is not far-fetched as it is consistent with previous studies by Frimpong and Oteng-Abayie (2006) and Antwi et.al (2013) for Ghana but poles apart to the empirical conclusions by Balasubramanyam, et al. (1999) for 46 developing countries including Ghana, Asheghian (2004), Asafu-Adjaye (2005) for Ghana, Vu, et al. (2006) for Vietnam and Abosi (2008) for Ghana. The results can be justified based on the fact that the mining sector which had and is still the dominant FDI recipient sector in the Ghanaian economy does not generate direct growth impacts on the wider economy (see Frimpong and Oteng-Abayie, 2006). In other words, FDI does not impact positively on economic growth since FDI to



the mining sector does not have significant spill over effects on other sectors due to the near inadequate or absence of the productive linkages to the other sectors in the economy. More so, a bulk of the earnings generated by FDI inflows are repatriated back to their countries of origin and the little that is reinvested in the country are largely lost to corruption, misplaced priorities, high association of FDI inflows to poorly orchestrated mergers and acquisition such that FDI is a mere replacement of domestic investment and the fact that there is no clear-cut national policy statement for FDI. The insignificant effect of FDI on economic growth may be because of the small FDI stock relative to GDP and low share of FDI inflows in domestic capital formation in the Ghanaian economy. Finally, it may be because Ghana has not received much FDI in manufacturing sectors which, on average, offer higher positive growth effects through spill overs in the long run. Aryeetey et al. (2008) identified such factors as access to land, property registration, regulations, availability of skilled labour and labour productivity issues as important reasons for not receiving much FDI in Ghana.

Contrary to the results of the impact of FDI on growth in model I and II, the coefficient of trade openness was found to be not only positive but statistically significant (at 1% significance level) in both estimated models. The sign of the coefficient of trade openness therefore affirms theoretical deductions of the classical trade theory that more trade indeed contributes positively to the growth of economies. The realised coefficient of 0.0037 and 0.0027 in models I and II respectively implies that a unit increase in trade openness leads to approximately 0.37 and 0.27 increase in real GDP in models I and II respectively. The phenomenal impact of trade openness to the Ghanaian economy can be alluded to the relentless efforts of successive governments of Ghana since 1986 to liberalise and forge productive trade relationships with other economies. This has invariably yielded competition and efficiency in the export sector since the export diversification program has immensely improved the performance of non-traditional exports such as pineapple and other citrus fruits on the international multilateral trading system. This



goes to adduce the promotion of trade liberalisation policies as one crucial ways to spur economic growth and development in Ghana. This positive and significant relationship between trade openness and economic growth is consistent with previous works of Asiedu (2002) for both developed and developing countries, Sakyi (2011) for Ghana, and Matadeen et.al, (2011) for Mauritius whose results exhibited the same feature.

More importantly, from the analysis, the coefficient of the interaction between FDI and trade which happened to be the main thrust of the study, exhibited a positive but insignificant impact on real GDP for the period under consideration. This result is not consistent with the theoretical inclinations of the Bhagwati's hypothesis which contends that "with due adjustments for differences among countries for their economic size, political attitudes towards FDI and stability, both the magnitude of FDI flows and their efficacy in promoting economic growth will be greater over the long run in countries pursuing the export promotion (EP) strategy than in countries pursuing the import substitution (IS) strategy" (Bhagwati 1978,1985). Though the expected sign was realised, the results in Table 4.3 does not adequately support the hypothesis with respect to the Ghanaian economy since the coefficient of the interaction between FDI and trade is not statistically different from zero.

It is also worth mentioning that the introduction of the interaction term in the model did not only reduce the impact of trade in the model II (i.e. from 0.37% to 0.27%) but further worsened the impact of FDI thus ultimately reducing the impact of the interaction term on real GDP. The empirical results suggest that FDI in the Ghanaian economy is not necessarily growth enhancing, more so its interaction with trade does not have any significant impact on the economy. Thus though Bhagwati hypothesized that the effect of FDI on the economic growth of the recipient economy would be stronger in the face of more international trade, there appears to be little or no evidence supporting it in the case of Ghana. This result is consistent with that of



Mah's (2010) on Korea but different from previous tests like Balasubramaniam et al., (1996), Athukorala and Chand, (2000), Kohpaiboon, (2003), Ahmad et al., (2006).

Finally, the coefficient of the dummy variable for economic liberalisation as well as that of the political liberalisation was found to be highly significant at 1% significant level in both models. This goes to re-echo the enormous contribution of these two indicators to the growth of the Ghanaian economy. Economic liberalization as well as improvements in the political environment has helped open up the economy and thus raise economic growth. It is worth mentioning that the results obtained for the dummy variable of economic liberalisation is consistent with the findings of Aryeetey and Fosu (2005) but not consistent with that of previous works done in the Ghanaian economy like that of Frimpong and OtengAbayie (2006).

#### **4.3 Results of the short run dynamic model**

As a matter of principle, it is crucial to estimate the short run dynamics associated with the long run model. The Error Correction Model (ECM) therefore reflects the speed of adjustment in response to a deviation from the long run equilibrium (Cholifihani, 2008). In this regard, the error correction representations for the respective selected ARDL models are presented in Table 4.4. A cursory look at the results reveals that most of the short-run dynamic impacts are maintained to the long-run as all the variables had their expected signs.



Table 4.3 Results of estimated ARDL long run coefficients

| Independent variable | Dependent Variable is Real GDP |                       |
|----------------------|--------------------------------|-----------------------|
|                      | I                              | II                    |
| Intercept            | 7.3755***<br>(0.1946)          | 7.3006***<br>(0.2143) |
| K                    | 0.0440***<br>(0.0077)          | 0.4693***<br>(.00851) |
| lnL                  | 0.2931*<br>(0.1628)            | 0.3548**<br>(0.1713)  |
| FDI                  | 0.0032<br>(0.0062)             | -0.2188<br>(0.0201)   |
| TR                   | 0.0037***<br>(0.0010)          | 0.0027***<br>(0.0009) |
| D                    | 0.5301***<br>(0.1041)          | 0.5034***<br>(0.1053) |
| POL                  | 0.0316***<br>(0.0055)          | 0.0318***<br>(0.0060) |
| FDI*TR               | ---                            | 0.00023<br>(0.0002)   |

Source: Computed from Microfit 5.0. \*\*\*(\*\*) and \* denotes rejection of null hypothesis at 1%(5%) and 10% significance level. Standard errors in parenthesis



Only the coefficients of trade and the dummy variable for economic liberalisation were found to be positive and significant in both estimated models. The result implies that a unit increase in trade openness leads to a 0.12% increase in real GDP in the short run for both models. Though there was a positive but significant impact in both long run and short run, a careful examination indicates that the long run impact is relatively higher than the short run. This beckons the relevance of international trade in the long run as well as the short run growth considerations of the Ghanaian economy though highly impactful in the long run. Thus the absolute effect of trade on the Ghanaian economy would be felt more at a later time. This result was consistent with that arrived by Sakyi (2011) for Ghana and Matadeen et.al, (2011) for Mauritius whose results exhibited similar features.

The results further suggests an increase of 24.87 and 23.45 percentage points in real GDP under an economic trade liberalisation regime in the Ghanaian economy. Like the trade openness variable, the impact of the economic liberalisation is reduced in the error correction model. It is worth mentioning that the results generated for the dummy variable is in stark contrast to that arrived by Frimpong and Oteng-Abayie (2006) in their analysis of the Ghanaian economy but consistent with that of Aryeetey and Fosu (2005). This goes to suggest that indeed, the recent years of still adopting economic liberalisation policies has augured well for the Ghanaian economy.

This in effect implies that the two variables (i.e. trade openness and economic trade liberalisation) are critical macroeconomic determinants of economic growth of the Ghanaian economy not only in the long run but also the short run. The results generated for the error correction model goes to suggest that for policy makers to spur the development of the economy in the long run while stimulating economic growth in the short run, their key variables of interest should be trade openness and the quest for more economic liberalisation.



It is interesting to note that neither the coefficients of gross domestic capital, FDI nor labour force was found to be statistically different from zero in the error correction model despite the fact that they were all positively related to real GDP. Unlike the FDI variable which was not significant in the long run, it is worth taking cognisance of the fact that gross domestic capital and labour force were highly significant in the long run estimations. This results realised for labour force under the short run analysis was anticipated given the high unemployment rate which has bedevilled the country over the past decade.

Indeed, the estimated coefficient of the error correction term for both models was found to be significant with the appropriate sign, thus substantiating our previous results of existence of long run relationship between our variables of interest (Bannerjee *et al*,1998). More so, the magnitude of the estimate of the error correction term suggests a relatively less than average speed of adjustment from short run disequilibrium. The error correction mechanism (ECM) estimate of - 0.47 in both models implies that approximately 47% of the discrepancy in the previous year is adjusted for by the current year.

To assess the robustness of the estimated models, the study applied a number of diagnostic tests to the error correction model. A cursory look at the empirical results suggests that the overall fit is satisfactory with an R-squared of 0.873 and 0.853 in model I and II respectively. Thus, approximately 87.3% and 85.3% of the systemic variation in the dependent variable is explained by the error correction model. This implicitly suggests a high predictive power of the independent variables.



Table 4.4 Results of the estimated ARDL error correction models

| Independent variable | Dependent Variable is d(Real GDP) |                         |
|----------------------|-----------------------------------|-------------------------|
|                      | I                                 | II                      |
| Ecm(-1)              | -0.4691***<br>(0.0888)            | -0.46590***<br>(0.0931) |
| dK                   | 0.0025<br>(0.0015)                | 0.0014<br>(0.0015)      |
| dlnL                 | 0.3748<br>(0.9272)                | 0.1653<br>(0.9915)      |
| dFDI                 | 0.0012<br>(0.0004)                | -0.0102<br>(0.0090)     |
| dTR                  | 0.0012***<br>(0.0005)             | 0.0012***<br>(0.0004)   |
| dD                   | 0.2487***<br>(0.0318)             | 0.2345****<br>(0.3362)  |
| dPOL                 | 0.0015<br>(0.0018)                | 0.0009<br>(0.0019)      |
| d(FDI*TR)            | --                                | 0.0001<br>(0.0001)      |

Source: Computed from Microfit 5.1. \*\*\*(\*\*) and \* denotes rejection of null hypothesis at 1%(5%) and 10% significance level. Standard errors in parenthesis.



**Table 4.4 Continuation of Results of the estimated ARDL error correction models**

|                            |        |        |
|----------------------------|--------|--------|
| R-Squared                  | 0.873  | 0.853  |
| R- Bar Squared             | 0.7878 | 0.7636 |
| S.E. of Regression         | 0.0206 | 0.0217 |
| Residual Sum of Squares    | 0.0093 | 0.0108 |
| D-W-statistic              | 2.102  | 2.006  |
| Akaike Info. Criterion     | 88.043 | 86.147 |
| Schwarz Bayesian Criterion | 74.942 | 73.865 |

Source: Computed from Microfit 5.1. \*\*\*(\*\*) and \* denotes rejection of null hypothesis at 1%(5%) and 10% significance level. Standard errors in parenthesis.

In addition, the models passed the diagnostic tests of heteroscedasticity (White Heteroskedasticity Test), serial correlation (Durbin Watson test and Breusch-Godfrey test) and Jarque-Bera's normality tests. There was also much evidence in support of The Ramsey's RESET test which suggests that the estimated models are well specified. According to Pesaran and Pesaran (1997), once the error correction model has been estimated it is relevant to assess the stability of the parameters. Results of the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMQ) for the models indicated that the parameters of the models are highly stable over the time period under consideration since the plot of the CUSUM and CUSUMSQ statistic falls within the critical bounds of the 5% confidence interval of parameter stability (see appendix I).



Table 4.5 ARDL-ECM diagnostic tests (LM version) ARDL models

| Model                          | I                   | II                   |
|--------------------------------|---------------------|----------------------|
| Serial Correlation $\chi^2(1)$ | 0.16144<br>(0.688)  | 0.0037384<br>(0.951) |
| Functional Form $\chi^2(1)$    | 1.3541<br>(0.245)   | 0.34796<br>(0.555)   |
| Normality $\chi^2(1)$          | 0.122881<br>(0.940) | 3.2888<br>(0.193)    |
| Heteroscedasticity $\chi^2(1)$ | 0.06203<br>(0.803)  | 0.048171<br>(0.826)  |
| CUSUM                          | Stable              | Stable               |
| CUSUMQ                         | Stable              | Stable               |

Source: Computed from Microfit 5.1, probability values in parenthesis

4.4 Results of the pairwise Granger causality test

In line with the objectives of the paper, it is imperative not only to establish the long run and short run relationships between the variables of concern but also to bring afore the nature of the causalities existing between the estimated variables. In that regard, granger causality tests were run to establish the existence and direction of any causal relationships. The null hypothesis that a variable or a set of variables do not granger cause another variable were therefore tested. Since the Granger causality test is sensitive to the number of lagged terms introduced in the model the test was run with different lag values. After observing no apprant differences in the granger causality tests with up to four lagged values, the results for the granger causality tests with a maximal lag order of three ( $dmax=3$ ) are reported in Table 4.5.



The results of the granger causality tests indeed corroborate the results of the short run dynamic model. The generated probability values suggest that at the 10% significance level or better, there is evidence of unidirectional granger causality running from labour to growth, growth to FDI and growth to trade. This implies that historically, labour force of the Ghanaian economy does not only precipitate increases in real GDP but it is also a better predictor of real GDP.

**Table 4.6 Results of pairwise granger causality tests**

| Null Hypothesis                     | F-Statistic | Probability |
|-------------------------------------|-------------|-------------|
| LNRGDP does not Granger cause K     | 0.51069     | 0.6779      |
| K does not Granger cause LNRGDP     | 0.59037     | 0.6260      |
| LNRGDP does not Granger cause LNL   | 1.41830     | 0.2561      |
| LNL does not Granger cause LNRGDP   | 4.26388***  | 0.0124      |
| LNRGDP does not Granger cause FDI   | 2.56206     | 0.0727      |
| FDI does not Granger cause LNRGDP   | 0.75769     | 0.5264      |
| LNRGDP does not Granger cause TR    | 3.06626**   | 0.0424      |
| TR does not Granger cause LNRGDP    | 0.66052     | 0.5826      |
| LNRGDP does not Granger cause FDI*T | 1.63506     | 0.2014      |
| FDI*T does not Granger cause LNRGDP | 0.73532     | 0.5389      |
| FDI does not Granger cause TR       | 4.73226***  | 0.0078      |
| TR does not Granger cause FDI       | 0.07530     | 0.9728      |

\*\*\*(\*\*) and \* denotes rejection of null hypothesis at 1%(5%) and 10% significance level. All results are obtained using E-views 7.0 econometric package.

As already established, the results further showed a unidirectional causal relationship running from growth to FDI for the Ghanaian economy. This is as a result of the rejection of the null hypothesis that real GDP does not granger cause FDI at 5% significance level. This suggests



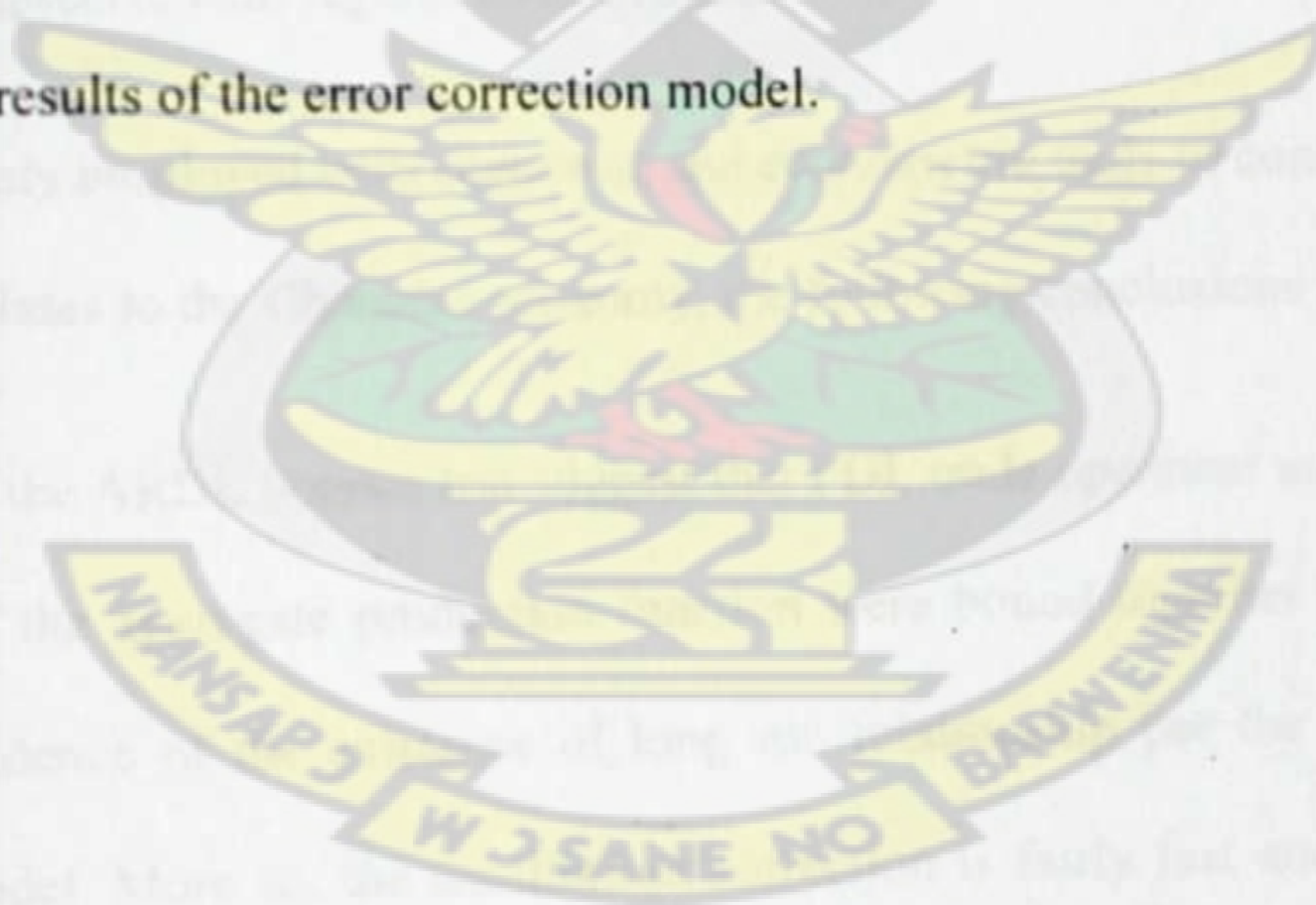
that growth in real GDP is a better predictor of the quantum of FDI inflows into the Ghanaian economy and not the other way round. Thus for the Ghanaian economy to significantly attract more FDI in the sub region, more efforts have to be placed on propelling the economy at a faster rate. Nonetheless, the outcome of the granger causality tests and the econometric estimations goes to give credence to the fact that the direct growth impact of FDI on the Ghanaian economy has not existed so far. There is therefore little evidence in support of the hypothesis that FDI causes growth in the Ghanaian economy. Rapid economic growth in the Ghanaian economy could result in an increase in FDI inflows. This result is in stark contrast from that arrived by Chakraborty and Basu (2002), Frimpong and Oteng-Abayie (2007) and Esso (2010) who found no causal relationship between FDI and growth for the Ghanaian economy. The results is however consistent with that of the findings of Mah (2010) for Korea.

In another development, the results showed a one way causal relationship between real GDP and trade openness, implying that the real GDP is not only a better predictor of FDI but also trade openness. This suggests that most of the performance in the international multilateral trading system is usually preceded by the performance of the economy (i.e economic growth). This results is however inconsistent with that of the empirical findings of Olusegun, *et al.* (2009) for Nigeria.

More importantly, the granger causality test results suggest a unidirectional causal relationship running from FDI to trade openness since there was not enough evidence to reject the null hypothesis of Granger no-causality between FDI and trade openness in Ghana. This implies that though FDI is a better predictor of trade openness, trade openness is not a good predictor of FDI inflows. Thus, the quantum of FDI inflow provides enough evidence to envisage the volume of imports and exports of the Ghanaian economy. Implying loosely that despite the fact that FDI is insignificant in the estimated growth model, it has a high association with trade openness, which



is overtly significant in the growth accounting matrix of the economy. One can therefore conclude that generally, the trade performance of Ghana as a result of increased capacity and competitiveness in domestic production financed through FDI spurs economic growth (Ajayi, 2006). This is in tandem with the modernization theories, which views the collaboration of FDI inflows and international trade as positive forces to economic growth because they stimulate specialization, creates efficient division of labour, industrialization and urbanization (Burkhart and De Soysa, 2003). More so, this peculiar link between FDI and trade also confirms Vernom's (1966) assertion of trade and FDI within the context of the product life cycle theory. Finally, it is worth mentioning that the granger causality test results exhibited no evidence of bidirectional causal relationship between FDI, trade and growth at the 10% significance level or better. More so, the results suggests no causality whatsoever for real GDP and domestic capital investment nor the real GDP and the interaction between FDI and trade thereby adequately substantiating the results of the error correction model.





## CHAPTER FIVE

### SUMMARY, RECOMMENDATIONS AND CONCLUSION

#### 5.1 Introduction

The chapter briefly summarizes the major findings of the research, deduces the policy recommendations and provides detailed conclusion of the study.

#### 5.2 Summary of findings

This paper empirically investigated the nexus between FDI, trade and economic growth in the Ghanaian economy for the periods 1970 to 2010. While a number of theoretical economic models including the famous Bhagwati's hypothesis predicts relatively higher magnitudes of FDI inflows as well as their efficacy in promoting economic growth in the long run for recipient nations advancing trade liberalisation policies, a lot of the empirical country studies have been inconclusive or imprecise with regards to this nexus.

Having meticulously employed both economic and econometric tools to confirm the Bhagwati's hypothesis as it relates to the Ghanaian economy, the following conclusions were arrived at

- The results of the ARDL bounds test suggest that FDI, trade openness and growth within the framework of the aggregate production function were bound together in the long run and there was evidence of the existence of long run relationship per the results of the error correction model. More so, the equilibrium correction is fairly fast and discrepancy in the previous year is adjusted for by the current year.
- The study like previous empirical findings demonstrated no strong evidence to support the notion that FDI has been pivotal to economic growth in Ghana despite the efforts of successive governments. This is because it was found to be highly insignificant in all the estimated models. More so the contrasting signs of its coefficients generated under different models in both the long and the short run analysis further reflects the ambiguity that exists



with respect to the contribution of FDI to economic growth in Ghana for the years under consideration. This can be explained in part by the fact that the mining sector which lacks the necessary productive linkages to have significant spillover effects on other sectors in the economy still remains the dominant recipient of FDI inflows into the Ghanaian economy. Also, a bulk of the earnings generated by FDI inflows are repatriated back to their countries of origin and the little that is reinvested in the country are largely lost to corruption, high association of FDI inflows to poorly orchestrated M&As and the fact that there is no clear-cut national policy statement for foreign investment in the economy. This may also be due to the small FDI stock relative to GDP and low share of FDI inflows in domestic capital formation in the Ghanaian economy. Finally, it may be because Ghana has not received much FDI in manufacturing sectors which, on average, offer higher positive growth effects through spillovers in the long run. Aryeetey et al. (2008) identified such factors as access to land, property registration, regulations, availability of skilled labour and labour productivity issues as important reasons for not receiving much FDI in Ghana. It is important to note that the findings do not necessarily imply that FDI is unimportant. Rather, its analysis downplays the confidence in the belief that FDI has wielded an independent growth effect in Ghana.

- The empirical findings of the study further suggest that there exists positive and significant relationship between trade openness and economic growth in both the long and short run at 5% significance level. Thus corroborating the classical argument that trade openness resulting from comparative advantage subsequently spurs economic growth for Ghanaian economy irrespective of whether it is in the long run or the short run. Despite this remarkable contribution to the Ghanaian economy, it is worth taking cognisance of the fact that the coefficients of the short run estimates were however smaller than that of the long



run, thus suggesting that the efficacy of trade liberalization would be more impactful at a later time.

- More importantly, the collaboration between FDI and trade, which happened to be the main thrust of the study exhibited a positive but insignificant impact on growth for the period under consideration. Though the expected sign was realised, the results do not adequately support the Bhagwati's hypothesis with respect to the Ghanaian economy. Furthermore, there was no evidence of causality whatsoever between the interaction of FDI and trade openness ( $FDI \cdot T$ ) and economic growth in the case of the Ghanaian economy. Thus despite the many years of higher international trade openness ratio in Ghana, the efficacy of FDI inflows in promoting economic growth has still not been significantly realised. This result is consistent with that of Mah (2010) for Korea but at poles apart with the other empirical findings (Balasubramaniam et al., 1996; Athukorala and Chand, 2000; Kohpaiboon, 2003; Ahmad et al., 2006). It is also worth mentioning that, despite the little evidence to support the validity of Bhagwati's hypothesis in the Ghanaian economy; FDI still remains a good predictor of trade in the Ghanaian economy.
- The study also revealed that gross domestic investment is an important engine of growth in the Ghanaian economy. Empirical evidence from the study does not only suggest a positive significant relationship between gross domestic investment and growth in the long but also that gross domestic investment has a relatively higher impact on gross domestic capital on growth relative to the other variables. This indicates that in as much as FDI contributes to the economic growth, domestic capital is also immensely relevant in growth considerations in the case of the Ghanaian economy. Thus supporting the notion that foreign capital (FDI) is only meant to augment existing capital in the economy and that for a country to be certain of the contribution of a stock of capital to economic growth, efficient generation and use of its domestic capital is equally important.



- The study also found a positive and significant long run relationship between the labour force and economic growth. This reemphasizes the crucial role played by the labour force in the growth process of the Ghanaian economy in the long run and the insignificant contribution of the labour force in the short run given the high unemployment rate which has bedevilled the Ghanaian economy over the past decade.
- Finally, the empirical evidence confirms the relevance of economic liberalisation regimes and the political environment in the growth of the Ghanaian economy. The economic liberalisation dummy variable was found to be significant at 5% significance level in both the long run and the short run. The polity variable was however only significant in the long run.

### 5.3 Policy implications and recommendations

The main thrust of this study was to examine the impact of FDI-trade interaction on economic growth in pre and post economic liberalization periods of Ghana. Using the findings outlined in section 5.1 as hindsight, the following economic policy implications as well as recommendations have been deduced:

- Having established that FDI is not only insignificant but sometimes negatively or positively related to economic growth in either the long or short run analysis invariably reflects the ambiguity that exists with respect to the contribution of FDI to economic growth in the Ghanaian economy for the years under consideration. The implications are that the chief recipient sectors of FDI do not generate direct growth impacts on the wider economy, significant portions of earnings generated by FDI inflows are repatriated back and the little that is reinvested in the country are largely lost to corruption, the high association of Ghana's FDI performance to M&As suggests just mere replacement of capital and not additions to domestic investments, the absence of a clear-cut national policy statement for foreign



investment in the economy and hence the equivocal role of FDI in propelling growth in the Ghanaian economy.

Despite the hindrances of the performance of FDI in the economy, FDI can be growth enhancing if it well harnessed and used in such a way that it can significantly contribute to economic growth in Ghana. This goes to say that, though huge FDI inflows are crucial to attaining the growth prospects of the economy, the way it is invested is also crucial. Channelling FDI into areas of comparative advantage such as export-oriented industrial and agricultural sectors of the economy is of paramount importance if FDI is to be growth enhancing. More so, competitiveness should be encouraged so that existing export processing and free trade zones should be equipped with state-of-the-art infrastructures (like power, energy, transportation, telecommunication etc) and technologies. This would ultimately increase Ghana's FDI inflow competitiveness in the sub region and thus enable the country to meet the required amount of FDI to spur economic growth.

- The study also established a positive and significant relationship between trade openness and real GDP growth in both the long run and short run. Thus irrespective of the economic time considerations, greater trade openness is growth enhancing in the Ghanaian economy. This is impressive as increased trade liberalisation is one channel through which Ghana can favourably compete with other developing countries in attracting FDI.

The policy implications of the results are that the implementation of trade policies be it at the sub-regional or global are reliable ways of spurring growth in the Ghanaian economy. Thus from bilateral or multilateral agreements (such as NAFTA, Interim EPAs) that rip to pieces trade barriers, to well negotiated trade rounds that reduce various forms of protection, to all forms of trade liberalization policies aimed at integrating the economy into the world trading system, the impact are growth enhancing.



Notwithstanding the positive outcome of past trade agreements, policy makers have to take cognizance of the precedence that exports takes over imports in trade negotiations for developing countries. If these findings are keenly adhered to by policy makers, it is pertinent that policies promoting value added exports and other trade-led growth strategies would be successfully pursued since this would ultimately be more welfare enhancing to the Ghanaian economy.

- According to the results, the interaction between FDI and trade has positive but insignificant impact on real GDP growth. Despite the fact that FDI is a good predictor of trade there appears to be little or no evidence supporting the Bhagwati's hypothesis implying that neither the quantum nor efficacy of FDI has improved despite the many years of adopting various trade liberalisation policies in the Ghanaian economy. The positive sign of the coefficient of the interaction term and the significant positive impact of the trade liberalisation variable in both the long and short run suggests that indeed Ghana has benefitted tremendously from its trade liberalisation policies but the country is yet to wholly benefit from the synchronisation between trade and FDI policies. This is in part due to the lack of harmonisation between trade and FDI policies in the economy. If these findings will be seriously considered by policy makers, it is crucial that policies aimed at integrating FDI and trade liberalisation can be successfully pursued in Ghana, which will undoubtedly spur economic growth.
- The study further showed a significant positive relationship between gross domestic investment and real GDP growth with the coefficient of gross domestic investment possessing a relatively greater impact on real GDP growth. This implies that economic growth could be propelled much faster if policy makers adopt policies that could increase savings and subsequently increase the amount of investable funds in the economy. In that regard, a well-functioning and liberalized financial market is key in ensuring that capital is



not left idle but rather channelled to where it is most beneficial. Also, government should massively increase its investments in plants, machinery, industrial buildings, research and development and other expenditures aimed at increasing the capital stock in the economy. This would invariably complement the low capital formation rate of households and domestic firms and thus spur the economy to an efficient growth path. Furthermore, policy makers should not wholly depend on foreign capital to spur economic growth but rather fall on domestic capital also by introducing timely strategies like joint ventures between domestic capital owners and foreign investors since the results from this study suggests that gross domestic investments are efficiently allocated and hence their impeccable impact on real GDP growth. This would ultimately afford domestic producers the opportunity to become part and enjoy the profit together with foreign direct investors who in turn exposed them to superior cutting edge technology, managerial skills and above all create more employment.

- Labour force was also found to have a significant positive relationship with real GDP growth in the long run but an insignificant impact on real GDP growth in the short run. The policy suggestion is therefore that the government should not relent in its efforts to devote more resources towards the expansion of technical and vocational education, and enhancing the non-formal education with strong emphasis on basic literacy and skills training if the nation is to grow at a faster rate in the long run.

#### 5.4 Conclusion

This study empirically investigated the nexus between FDI and trade on economic growth and tested the famous Bhagwati's hypothesis, which says that the quantity and efficacy of FDI inflow to economic growth is more pronounced in a relatively open trade regime. The study focused on the Ghanaian economy for the years of 1970 to 2010 within the framework of the



neoclassical aggregate production function. The econometric methodology employed were mainly the ARDL bounds test of cointegration and Granger Causality test.

The empirical results of the study provide enough evidence of the existence of a long run relationship among the variables of interest. More so, the role of FDI in propelling growth in the Ghanaian economy still remains ambiguous whilst trade openness and gross domestic capital have a positive and significant impact on real GDP growth both in the long and short run. The interaction between FDI and trade also exhibited a positive but insignificant impact on economic growth therefore refuting the validity of Baghwati's hypothesis as it relates to the Ghanaian economy. However, there exists a unidirectional causal relationships running from real GDP to FDI and trade, and also from FDI to trade.

Using the findings as a hindsight, the study recommended the channelling of FDI into areas of comparative advantage such as export-oriented industrial and agricultural sectors of the economy, promotion of value added exports and other trade-led growth strategies, harmonization of trade and FDI strategies in long term development plans and above all that policy makers should not wholly depend on foreign capital to spur economic growth but rather fall on domestic capital by introducing timely strategies like joint ventures between domestic capital owners and foreign investors as this will be more welfare enhancing to the Ghanaian economy.



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APPENDICES

Appendix I

Results of the ARDL estimates

Autoregressive Distributed Lag Estimates (MODEL I)

ARDL(1,3,0,0,2,3) selected based on Schwarz Bayesian Criterion

\*\*\*\*\*

Dependent variable is LNRGDP  
38 observations used for estimation from 1973 to 2010

\*\*\*\*\*

| Regressor  | Coefficient | Standard Error | T-Ratio[Prob] |
|------------|-------------|----------------|---------------|
| LNRGDP(-1) | .53090      | .088825        | 5.9770[.000]  |
| K          | .0025265    | .0014967       | 1.6880[.106]  |
| K(-1)      | .0080004    | .0020553       | 3.8925[.001]  |
| K(-2)      | .0021950    | .0014912       | 1.4720[.155]  |
| K(-3)      | .0079399    | .0013645       | 5.8191[.000]  |
| LNL        | .13748      | .092718        | 1.4827[.152]  |
| FDI        | .0015180    | .0029628       | .51235[.614]  |
| TR         | .0012382    | .4554E-3       | 2.7191[.013]  |
| TR(-1)     | -.4690E-3   | .4866E-3       | -.96376[.346] |
| TR(-2)     | .9619E-3    | .4216E-3       | 2.2817[.033]  |
| POL        | .0014833    | .0017857       | .83066[.415]  |
| POL(-1)    | .0045992    | .0021060       | 2.1839[.040]  |
| POL(-2)    | -.0016302   | .0017741       | -.91885[.368] |
| POL(-3)    | .010352     | .0020445       | 5.0634[.000]  |
| C          | 3.4598      | .65835         | 5.2553[.000]  |
| D          | .24870      | .031822        | 7.8152[.000]  |

\*\*\*\*\*

|                            |          |                            |                         |
|----------------------------|----------|----------------------------|-------------------------|
| R-Squared                  | .99846   | R-Bar-Squared              | .99741                  |
| S.E. of Regression         | .020576  | F-Stat.                    | F(15,22) 952.1466[.000] |
| Mean of Dependent Variable | 9.2260   | S.D. of Dependent Variable | .40456                  |
| Residual Sum of Squares    | .0093139 | Equation Log-likelihood    | 104.0431                |
| Akaike Info. Criterion     | 88.0431  | Schwarz Bayesian Criterion | 74.9424                 |
| DW-statistic               | 2.1023   | Durbin's h-statistic       | -.37674[.706]           |

\*\*\*\*\*

Testing for existence of a level relationship among the variables in the ARDL model

\*\*\*\*\*

|             |                 |                 |                 |                 |
|-------------|-----------------|-----------------|-----------------|-----------------|
| F-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
| 10.2981     | 3.3979          | 4.6800          | 2.8764          | 4.0202          |

|             |                 |                 |                 |                 |
|-------------|-----------------|-----------------|-----------------|-----------------|
| W-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
| 61.7884     | 20.3872         | 28.0798         | 17.2582         | 24.1214         |

\*\*\*\*\*

If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.



## Estimated Long Run Coefficients using the ARDL Approach (Model I)

ARDL(1,3,0,0,2,3) selected based on Schwarz Bayesian Criterion

```
*****
Dependent variable is LNRGDP
38 observations used for estimation from 1973 to 2010
*****
```

| Regressor | Coefficient | Standard Error | T-Ratio[Prob] |
|-----------|-------------|----------------|---------------|
| K         | .044046     | .0077409       | 5.6900[.000]  |
| LNL       | .29307      | .16281         | 1.8001[.086]  |
| FDI       | .0032360    | .0061638       | .52501[.605]  |
| TR        | .0036905    | .9722E-3       | 3.7958[.001]  |
| POL       | .031560     | .0055098       | 5.7280[.000]  |
| C         | 7.3755      | .19464         | 37.8925[.000] |
| D         | .53016      | .10409         | 5.0934[.000]  |

Testing for existence of a level relationship among the variables in the ARDL model

| F-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
|-------------|-----------------|-----------------|-----------------|-----------------|
| 10.2981     | 3.3979          | 4.6800          | 2.8764          | 4.0202          |

| W-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
|-------------|-----------------|-----------------|-----------------|-----------------|
| 61.7884     | 20.3872         | 28.0798         | 17.2582         | 24.1214         |

If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.

## Error Correction Representation for the Selected ARDL (MODEL I)

ARDL(1,3,0,0,2,3) selected based on Schwarz Bayesian Criterion

```
*****
Dependent variable is dLNRGDP
38 observations used for estimation from 1973 to 2010
*****
```

| Regressor | Coefficient | Standard Error | T-Ratio[Prob] |
|-----------|-------------|----------------|---------------|
| dK        | .0025265    | .0014967       | 1.6880[.104]  |
| dK1       | -.010135    | .0017721       | -5.7190[.000] |
| dK2       | -.0079399   | .0013645       | -5.8191[.000] |
| dLNL      | .13748      | .092718        | 1.4827[.151]  |
| dFDI      | .0015180    | .0029628       | .51235[.613]  |
| dTR       | .0012382    | .4554E-3       | 2.7191[.012]  |
| dTR1      | -.9619E-3   | .4216E-3       | -2.2817[.031] |
| dPOL      | .0014833    | .0017857       | .83066[.414]  |
| dPOL1     | -.0087221   | .0019522       | -4.4678[.000] |
| dPOL2     | -.010352    | .0020445       | -5.0634[.000] |
| dD        | .24870      | .031822        | 7.8152[.000]  |
| ecm(-1)   | -.46910     | .088825        | -5.2812[.000] |

List of additional temporary variables created:

dLNRGDP = LNRGDP-LNMGDP(-1)

dK = K-K(-1)

dK1 = K(-1)-K(-2)

dK2 = K(-2)-K(-3)

dLNL = LNL-LNL(-1)

dFDI = FDI-FDI(-1)

dTR = TR-TR(-1)



```

dTR1 = TR(-1)-TR(-2)
dPOL = POL-POL(-1)
dPOL1 = POL(-1)-POL(-2)
dPOL2 = POL(-2)-POL(-3)
dD = D-D(-1)
ecm = LNRGDP -.044046*K -.29307*LNL -.0032360*FDI -.0036905*TR -.031560*PO
L -.7.3755*C -.53016*D

```

```

*****
R-Squared .87382 R-Bar-Squared .78779
S.E. of Regression .020576 F-Stat. F(12,25) 12.6960[.000] .
Mean of Dependent Variable .032232 S.D. of Dependent Variable .044665
Residual Sum of Squares .0093139 Equation Log-likelihood 104.0431
Akaike Info. Criterion 88.0431 Schwarz Bayesian Criterion 74.9424
DW-statistic 2.1023

```

\*\*\*\*\*  
R-Squared and R-Bar-Squared measures refer to the dependent variable dLNRGDP and in cases where the error correction model is highly restricted, these measures could become negative.

Testing for existence of a level relationship among the variables in the ARDL model

```

*****
F-statistic 95% Lower Bound 95% Upper Bound 90% Lower Bound 90% Upper Bound
10.2981 3.3979 4.6800 2.8764 4.0202

```

```

W-statistic 95% Lower Bound 95% Upper Bound 90% Lower Bound 90% Upper Bound
61.7884 20.3872 28.0798 17.2582 24.1214

```

\*\*\*\*\*  
If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.

### Diagnostic Tests

```

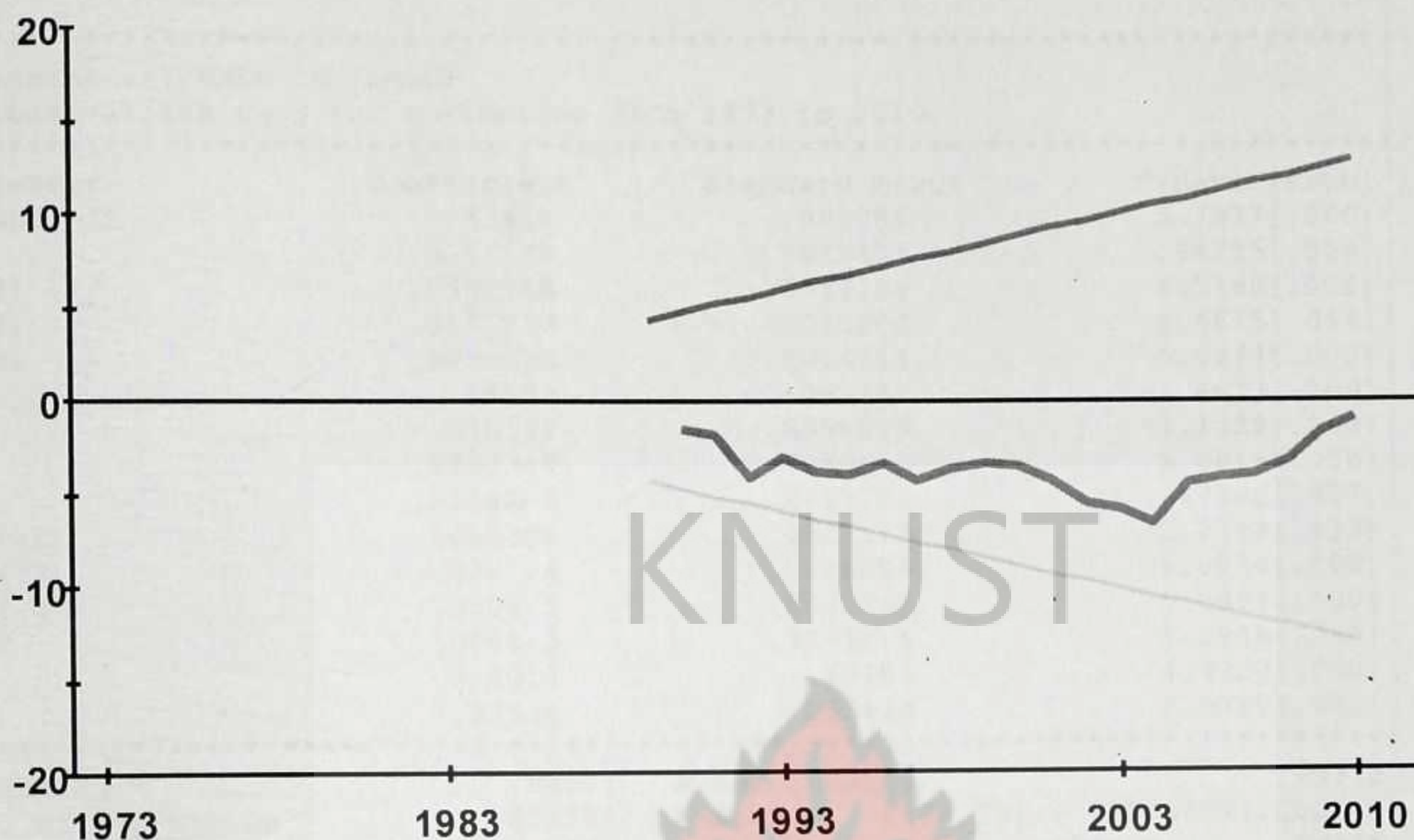
*****
* Test Statistics * LM Version * F Version *
*****
* A:Serial Correlation*CHSQ(1) = .16144[.688]*F(1,21) = .089596[.768]*
* B:Functional Form *CHSQ(1) = 1.3541[.245]*F(1,21) = .77596[.388]*
* C:Normality *CHSQ(2) = .12288[.940]* Not applicable
* D:Heteroscedasticity*CHSQ(1) = .062030[.803]*F(1,36) = .058861[.810]*
*****

```

A:Lagrange multiplier test of residual serial correlation  
B:Ramsey's RESET test using the square of the fitted values  
C:Based on a test of skewness and kurtosis of residuals  
D:Based on the regression of squared residuals on squared fitted values

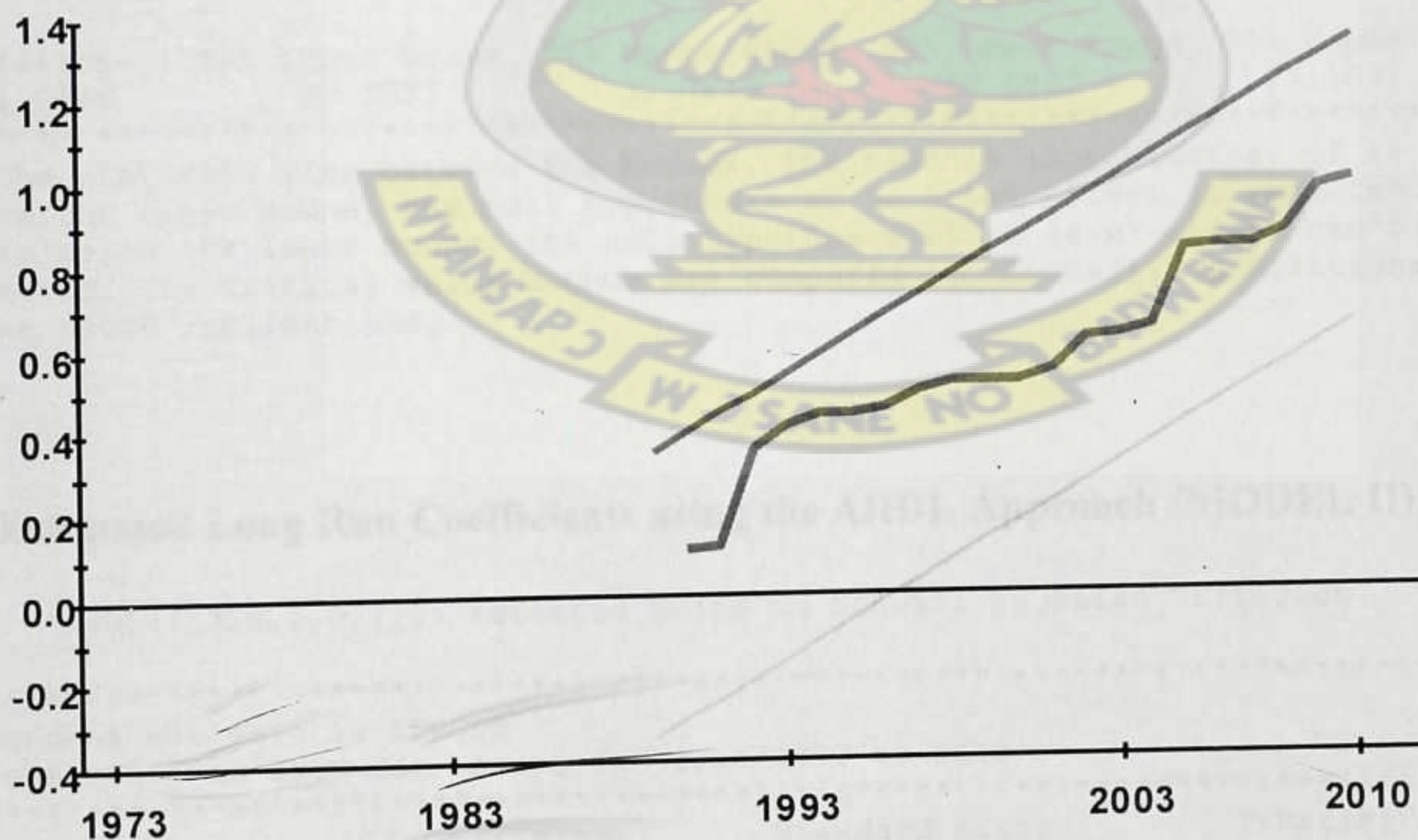


## Plot of Cumulative Sum of Recursive Residuals



The straight lines represent critical bounds at 5% significance level

## Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level



## Autoregressive Distributed Lag Estimates (MODEL II)

ARDL(1,3,0,0,0,3,0) selected based on Schwarz Bayesian Criterion

Dependent variable is LNRGDP

38 observations used for estimation from 1973 to 2010

| Regressor                  | Coefficient | Standard Error             | T-Ratio[Prob]   |
|----------------------------|-------------|----------------------------|-----------------|
| LNRGDP(-1)                 | .53410      | .093086                    | 5.7377[.000]    |
| K                          | .0014578    | .0015471                   | .94225[.356]    |
| K(-1)                      | .0090348    | .0019155                   | 4.7168[.000]    |
| K(-2)                      | .0035217    | .0013202                   | 2.6675[.014]    |
| K(-3)                      | .0078523    | .0014414                   | 5.4477[.000]    |
| LNL                        | .16532      | .099154                    | 1.6673[.109]    |
| FDI                        | -.010197    | .0090019                   | -1.1328[.269]   |
| TR                         | .0012349    | .4286E-3                   | 2.8816[.008]    |
| POL                        | .9184E-3    | .0019181                   | .47880[.637]    |
| POL(-1)                    | .0050304    | .0022113                   | 2.2748[.033]    |
| POL(-2)                    | -.0020124   | .0018489                   | -1.0884[.288]   |
| POL(-3)                    | .010875     | .0021367                   | 5.0895[.000]    |
| FDIT                       | .1086E-3    | .9091E-4                   | 1.1949[.244]    |
| C                          | 3.4014      | .69101                     | 4.9223[.000]    |
| D                          | .23454      | .033616                    | 6.9769[.000]    |
| R-Squared                  | .99821      | R-Bar-Squared              | .99712          |
| S.E. of Regression         | .021717     | F-Stat. F(14,23)           | 915.5409[.000]  |
| Mean of Dependent Variable | 9.2260      | S.D. of Dependent Variable | .40456          |
| Residual Sum of Squares    | .010847     | Equation Log-likelihood    | 101.1476        |
| Akaike Info. Criterion     | 86.1476     | Schwarz Bayesian Criterion | 73.8657         |
| DW-statistic               | 2.0006      | Durbin's h-statistic       | -.0020904[.998] |

Testing for existence of a level relationship among the variables in the ARDL model

| F-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
|-------------|-----------------|-----------------|-----------------|-----------------|
| 4.4352      | 3.1990          | 4.5374          | 2.6551          | 3.8724          |
| W-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
| 31.0466     | 22.3933         | 31.7619         | 18.5857         | 27.1071         |

If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.

## Estimated Long Run Coefficients using the ARDL Approach (MODEL II)

ARDL(1,3,0,0,0,3,0) selected based on Schwarz Bayesian Criterion

Dependent variable is LNRGDP

38 observations used for estimation from 1973 to 2010

| Regressor | Coefficient | Standard Error | T-Ratio[Prob] |
|-----------|-------------|----------------|---------------|
| K         | .046934     | .0085164       | 5.5110[.000]  |
| LNL       | .35483      | .17132         | 2.0711[.050]  |
| FDI       | -.021888    | .020072        | -1.0905[.287] |
| TR        | .0026506    | .8956E-3       | 2.9595[.007]  |
| POL       | .031790     | .0059502       | 5.3427[.000]  |
| FDIT      | .2332E-3    | .1983E-3       | 1.1758[.252]  |



|   |        |        |               |
|---|--------|--------|---------------|
| C | 7.3006 | .21429 | 34.0681[.000] |
| D | .50341 | .10534 | 4.7788[.000]  |

Testing for existence of a level relationship among the variables in the ARDL model

| F-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
|-------------|-----------------|-----------------|-----------------|-----------------|
| 4.4352      | 3.1990          | 4.5374          | 2.6551          | 3.8724          |

| W-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
|-------------|-----------------|-----------------|-----------------|-----------------|
| 31.0466     | 22.3933         | 31.7619         | 18.5857         | 27.1071         |

If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.

## Error Correction Representation for the Selected ARDL (MODEL II)

ARDL(1,3,0,0,0,3,0) selected based on Schwarz Bayesian Criterion

Dependent variable is dLNRGDP

38 observations used for estimation from 1973 to 2010

| Regressor | Coefficient | Standard Error | T-Ratio[Prob] |
|-----------|-------------|----------------|---------------|
| dK        | .0014578    | .0015471       | .94225[.355]  |
| dK1       | -.011374    | .0018325       | -6.2067[.000] |
| dK2       | -.0078523   | .0014414       | -5.4477[.000] |
| dLNL      | .16532      | .099154        | 1.6673[.108]  |
| dFDI      | -.010197    | .0090019       | -1.1328[.268] |
| dTR       | .0012349    | .4286E-3       | 2.8816[.008]  |
| dPOL      | .9184E-3    | .0019181       | .47880[.636]  |
| dPOL1     | -.0088623   | .0020209       | -4.3853[.000] |
| dPOL2     | -.010875    | .0021367       | -5.0895[.000] |
| dFDIT     | .1086E-3    | .9091E-4       | 1.1949[.243]  |
| dD        | .23454      | .033616        | 6.9769[.000]  |
| ecm(-1)   | -.46590     | .093086        | -5.0051[.000] |

List of additional temporary variables created:

dLNRGDP = LNRGDP-LNRGDP(-1)

dK = K-K(-1)

dK1 = K(-1)-K(-2)

dK2 = K(-2)-K(-3)

dLNL = LNL-LNL(-1)

dFDI = FDI-FDI(-1)

dTR = TR-TR(-1)

dPOL = POL-POL(-1)

dPOL1 = POL(-1)-POL(-2)

dPOL2 = POL(-2)-POL(-3)

dFDIT = FDIT-FDIT(-1)

dD = D-D(-1)

ecm = LNRGDP -.046934\*K -.35483\*LNL + .021888\*FDI -.0026506\*TR -.031790\*P

OL -.2332E-3\*FDIT -7.3006\*C -.50341\*D

|                            |         |                            |               |
|----------------------------|---------|----------------------------|---------------|
| R-Squared                  | .85305  | R-Bar-Squared              | .76360        |
| S.E. of Regression         | .021717 | F-Stat. F(12,25)           | 11.1260[.000] |
| Mean of Dependent Variable | .032232 | S.D. of Dependent Variable | .044665       |
| Residual Sum of Squares    | .010847 | Equation Log-likelihood    | 101.1476      |
| Akaike Info. Criterion     | 86.1476 | Schwarz Bayesian Criterion | 73.8657       |
| DW-statistic               | 2.0006  |                            |               |

R-Squared and R-Bar-Squared measures refer to the dependent variable dLNRGDP and in cases where the error correction model is highly restricted, these measures could become negative.



Testing for existence of a level relationship among the variables in the ARDL model

\*\*\*\*\*

| F-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
|-------------|-----------------|-----------------|-----------------|-----------------|
| 4.4352      | 3.1990          | 4.5374          | 2.6551          | 3.8724          |

| W-statistic | 95% Lower Bound | 95% Upper Bound | 90% Lower Bound | 90% Upper Bound |
|-------------|-----------------|-----------------|-----------------|-----------------|
| 31.0466     | 22.3933         | 31.7619         | 18.5857         | 27.1071         |

\*\*\*\*\*

If the statistic lies between the bounds, the test is inconclusive. If it is above the upper bound, the null hypothesis of no level effect is rejected. If it is below the lower bound, the null hypothesis of no level effect can't be rejected. The critical value bounds are computed by stochastic simulations using 20000 replications.

### Diagnostic Tests ((MODEL II)

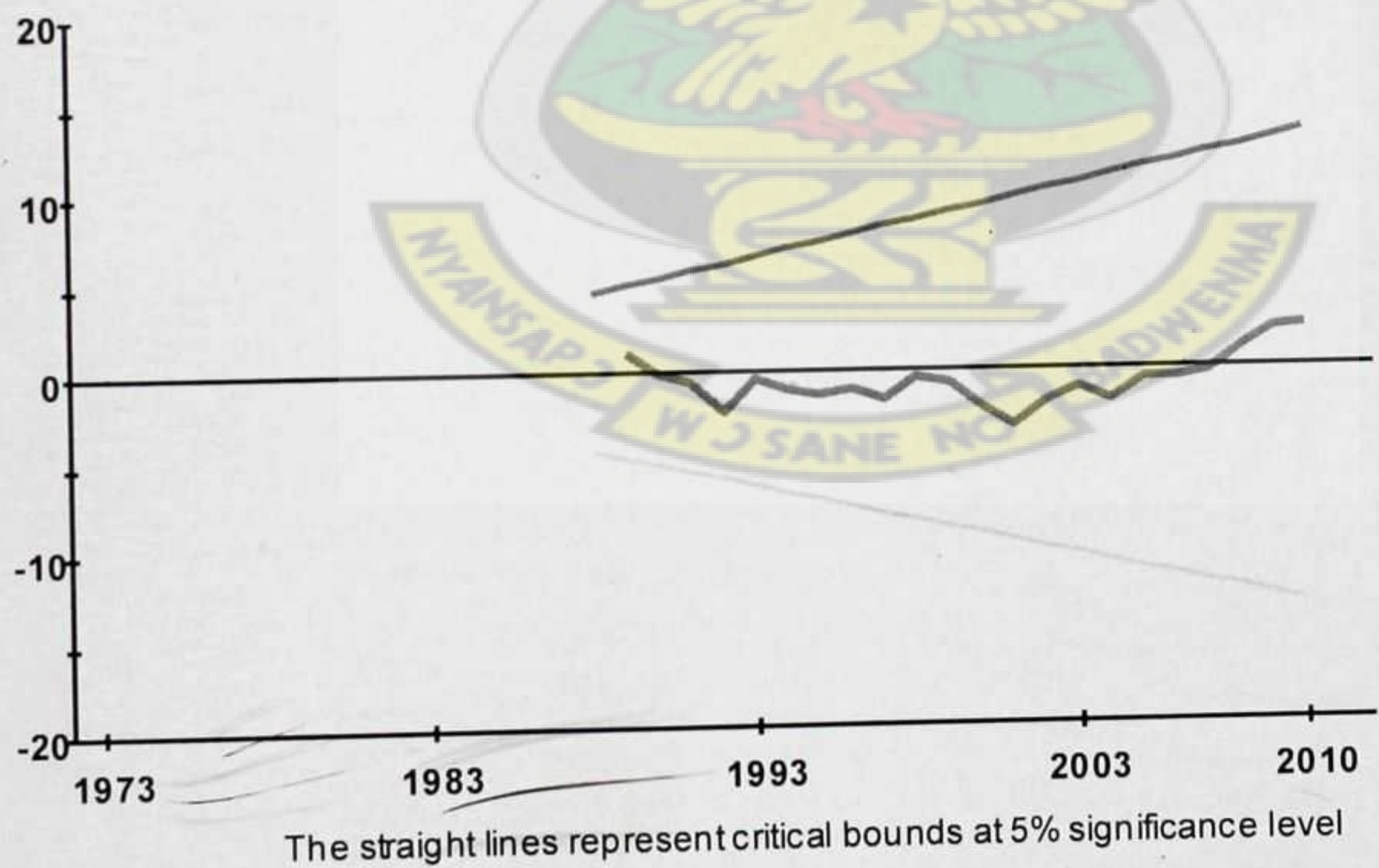
\*\*\*\*\*

| Test Statistics      | LM Version                        | F Version         |
|----------------------|-----------------------------------|-------------------|
| A:Serial Correlation | *CHSQ(1) = .0037384[.951]*F(1,22) | = .0021645[.963]* |
| B:Functional Form    | *CHSQ(1) = .34796[.555]*F(1,22)   | = .20331[.656]*   |
| C:Normality          | *CHSQ(2) = 3.2888[.193]*          | Not applicable    |
| D:Heteroscedasticity | *CHSQ(1) = .048171[.826]*F(1,36)  | = .045693[.832]*  |

\*\*\*\*\*

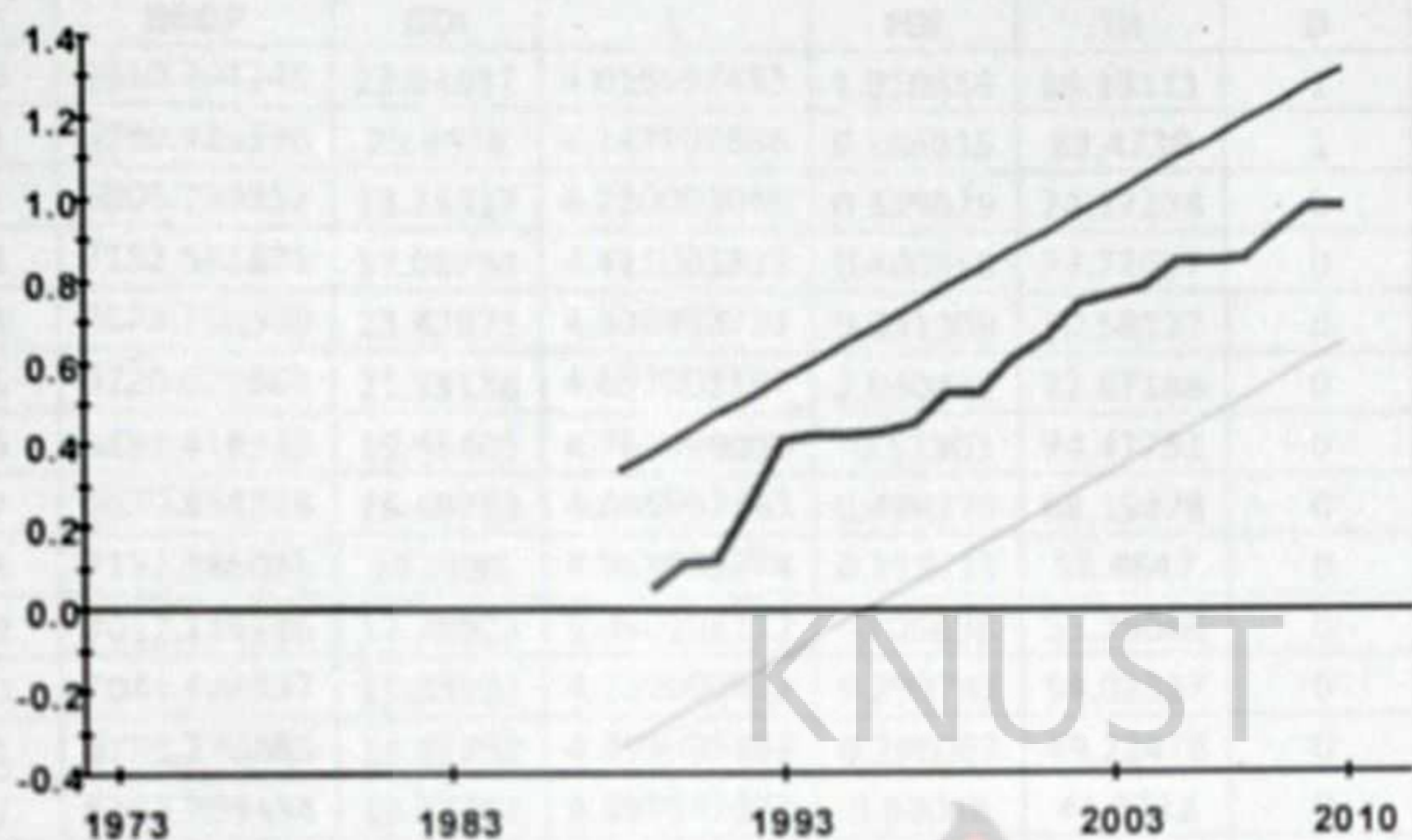
A:Lagrange multiplier test of residual serial correlation  
 B:Ramsey's RESET test using the square of the fitted values  
 C:Based on a test of skewness and kurtosis of residuals  
 D:Based on the regression of squared residuals on squared fitted values

Plot of Cumulative Sum of Recursive Residuals





## Plot of Cumulative Sum of Squares of Recursive Residuals



The straight lines represent critical bounds at 5% significance level





**Appendix II**  
**DATA USED FOR THE STUDY**

| Year | RGDP        | GDI      | L           | FDI      | TR       | D | POL |
|------|-------------|----------|-------------|----------|----------|---|-----|
| 1970 | 6610.204245 | 23.93857 | 4.016997452 | 1.910356 | 89.13111 | 1 | 3   |
| 1971 | 6980.323398 | 25.9978  | 4.147997638 | 0.789815 | 83.4739  | 1 | 3   |
| 1972 | 6805.239152 | 13.35317 | 4.280003045 | 0.339679 | 74.17238 | 0 | -7  |
| 1973 | 7182.581821 | 17.08734 | 4.411001323 | 0.460958 | 77.72097 | 0 | -7  |
| 1974 | 7674.769509 | 23.42871 | 4.536998731 | 0.391909 | 70.58137 | 0 | -7  |
| 1975 | 6720.670863 | 21.15136 | 4.657001197 | 2.030432 | 72.67188 | 0 | -7  |
| 1976 | 6483.418332 | 19.46403 | 4.767999005 | -0.51303 | 74.47751 | 0 | -7  |
| 1977 | 6630.858376 | 26.49783 | 4.865997453 | 0.496279 | 68.19878 | 0 | -7  |
| 1978 | 7192.886085 | 19.2695  | 4.963999274 | 0.215711 | 58.8647  | 0 | 0   |
| 1979 | 7012.116196 | 17.79923 | 5.080998112 | -0.05898 | 53.79666 | 0 | 6   |
| 1980 | 7044.428337 | 15.83932 | 4.200000822 | 0.299741 | 54.02337 | 0 | 6   |
| 1981 | 6798.270885 | 14.92752 | 4.399996392 | 0.296062 | 49.22478 | 0 | -7  |
| 1982 | 6327.709434 | 12.27208 | 4.599997321 | 0.30048  | 41.8212  | 0 | -7  |
| 1983 | 6038.808363 | 13.1448  | 4.699996298 | 0.044595 | 31.91669 | 0 | -7  |
| 1984 | 6561.018356 | 13.84794 | 4.899997628 | 0.032967 | 31.36427 | 1 | -7  |
| 1985 | 6894.316816 | 16.38505 | 5.100000925 | 0.085241 | 35.00671 | 1 | -7  |
| 1986 | 7253.693973 | 15.11423 | 5.299999472 | 0.060849 | 39.42672 | 1 | -7  |
| 1987 | 7601.501253 | 14.1971  | 5.399998744 | 0.061659 | 43.0805  | 1 | -7  |
| 1988 | 8029.326647 | 15.98037 | 5.60000069  | 0.060025 | 41.47438 | 1 | -7  |
| 1989 | 8437.687963 | 18.31231 | 5.79999886  | 0.178229 | 42.50581 | 1 | -7  |
| 1990 | 8718.563258 | 18.92394 | 5.999995511 | 0.148257 | 43.45339 | 1 | -7  |
| 1991 | 9179.062612 | 21.52462 | 6.20000266  | 0.178192 | 45.28265 | 1 | -4  |
| 1992 | 9535.156926 | 15.88474 | 6.399998276 | 0.20385  | 45.78281 | 1 | -1  |
| 1993 | 9997.612037 | 14.34463 | 6.600000475 | 1.306645 | 51.06536 | 1 | -1  |
| 1994 | 10324.45456 | 15.4168  | 6.899995235 | 2.669434 | 50.52084 | 1 | -1  |
| 1995 | 10739.84921 | 14.8859  | 7.199997804 | 1.027919 | 55.11272 | 1 | -1  |
| 1996 | 11233.46921 | 16.35428 | 7.399997934 | 1.080013 | 61.96396 | 1 | 2   |
| 1997 | 11705.07767 | 16.32734 | 7.70000302  | 0.74068  | 62.14676 | 1 | 2   |
| 1998 | 12254.48472 | 14.45974 | 8.000001435 | 1.396137 | 57.33544 | 1 | 2   |
| 1999 | 12797.17511 | 8.51352  | 8.300001712 | 1.970297 | 71.17505 | 1 | 2   |
| 2000 | 13335.36731 | 21.86488 | 8.600004453 | 2.077555 | 118.8914 | 1 | 2   |
| 2001 | 13940.66655 | 21.40893 | 8.799999996 | 1.048679 | 71.35436 | 1 | 6   |
| 2002 | 14608.93227 | 12.27754 | 9.100002798 | 0.596352 | 60.85509 | 1 | 6   |
| 2003 | 15372.12459 | 16.3526  | 9.300002984 | 1.117991 | 65.45416 | 1 | 6   |
| 2004 | 16194.99454 | 20.0709  | 9.599996376 | 0.97851  | 61.42929 | 1 | 8   |
| 2005 | 17198.39663 | 19.78688 | 9.899999642 | 0.842927 | 61.48664 | 1 | 8   |
| 2006 | 17981.23235 | 18.84414 | 9.99999628  | 3.116118 | 68.69786 | 1 | 8   |
| 2007 | 19142.74641 | 18.82558 | 9.99999628  | 5.586893 | 77.58095 | 1 | 8   |
| 2008 | 20756.60207 | 19.76733 | 11.00000493 | 9.516668 | 86.87588 | 1 | 8   |
| 2009 | 21723.39517 | 15.77268 | 11.00000493 | 5.441117 | 79.94692 | 1 | 8   |
| 2010 | 23161.524   | 20.91165 | 11.00000493 | 8.073222 | 121.6215 | 1 | 8   |