KWAME NKRUMAH
UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

COLLEGE OF ART AND SOCIAL SCIENCES

FACULTY OF SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

TRADE LIBERALIZATION AND ECONOMIC GROWTH IN GHANA
(1986 – 2007)

A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS, KWAME NKRUMAH UNIVERSITY OF SCIENCE & TECHNOLOGY, KUMASI IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF ARTS DEGREE IN ECONOMICS.

BY
ASIEDU, Michael Kwame

MAY, 2010

DECLARATION

I declare that this thesis submitted herein is an original work I have personally undertaken under supervision except where due acknowledgement has been made in the text.

…................................   …………………………..
 Date   Michael Kwame Asiedu

I declare that I have supervised the above student in undertaking the study reported herein and confirm that he has my permission to submit it for assessment.

………………………   .....…………………………
Date   Mrs Grace Ofori-Abebrese

DEDICATION

This work is dedicated to my father, Mr. Johnson Badu Tawiah who in spite of his inability to acquire formal education has worked diligently to bring me this far.

Also to Evelyn (my Mum) and siblings: Samuel, Absalom, William and Eunice.

ACKNOWLEDGEMENT

ABSTRACT

Trade liberalisation is often considered to be conducive for economic growth. In addition to the comparative advantage argument of the classical economists, trade liberalisation enhances competition, promotes large market, transfer of technology and hence efficiency in production. In the light of this, most developing countries have embraced the trade liberalisation policy as part of structural reforms.

Ghana has gradually liberalised its trade regime especially after 1986 when the country accepted the World Bank and IMF Structural Adjustment Programme (SAP). The main purpose of the liberalisation policy was to open up the economy to increase competition to improve efficiency in domestic industries so as to enhance economic growth.

The study was therefore carried out to find out the impact of the trade liberalisation policy on the GDP growth of Ghana from 1986 – 2007.

The study used the Autoregressive Distributed Lag (ARDL) approach to estimate the model specified for the study. The choice of the ARDL approach was mainly due to the smallness of the sample size. In the study, openness (sum of exports and imports to GDP) was used as a measure of liberalisation.

Using annual time series data from 1986 – 2007, the study found that trade liberalisation enhances GDP growth in Ghana in the long run but hampers growth in the short run. Capital stock, population growth, and inflation were all found to have positive impacts on GDP growth in both the short run and long run while foreign direct investment was found to have a negative impact on GDP growth.

The study recommended that domestic consumers should be encouraged to patronise locally made goods and services. This can be done through the organisation of rural trade fairs and exhibitions to bring made in Ghana goods to the doorsteps of the people. It was also recommended that foreign direct investors should be encouraged to invest in the agriculture and industrial sectors.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The issue of whether trade and increased openness--s should lead to higher rates of economic growth is an age-old question which has sustained debates between pro-traders and protectionists over the years — from Adam Smith, David Ricardo, John Stuart Mill and John Maynard-Keynes to Raul Prebisch and Hans Singer and to Jagdish Bhagwati and Paul Krugman. Theorists from both camps have influenced policy in many countries and at various stages of development. Early proponents of free trade lauded the gains from trade that could accrue to countries when they specialize in the production of goods in which they have comparative advantage, and engage in trade to meet their other needs. New development theorists contend that openness stimulates technological change by increasing domestic rivalry and competition, leading to increased innovation; and, that trade liberalization by allowing new goods to flow freely across national borders increases the stock of knowledge for technological innovations which spur growth.

The empirical literatures show that trade openness or liberalization affects output growth. Most of the studies have concluded that the openness of the trade regime has positive relation with GDP growth. Some of these studies include Ahmed, Y. and Anoruo, E. (2000), Edwards (1992, 1998), Sachs and Warner (1997), Harrison (1996), Iscan, T. (1998), Paulino (2002), Wacziarg (2001), Yanikkaya (2003), among others.

When Ghana gained independence in 1957, the country pursued a strategy of import substitution and implemented a series of restrictive trade policies including increasing tariffs, non-tariffs and exchange rate controls which lasted until 1982. The exchange rate was fixed while import quantities were strictly controlled through the Bank of Ghana foreign-exchange allocations (Armah, 1993). Between 1970 and 1982, both import volumes and import to GDP ratio registered continuous declines and the trend in the export/GDP ratio and the export volume index was downward. Export/GDP ratio fell from 20.7 to 3.6 and import/GDP ratio fell from 18.5 to 3.3. Again, Ghana's share of world exports declined by 68% during the same period. Large balance of payment deficits developed particularly in the early 1980s such that gross official foreign reserves were depleted and external payments arrears accumulated, amounting to about 90% of export earnings by the end of 1982 (World Bank, 1985).

Furthermore, inflation rates were very high averaging over 50%. Apart from the 139% devaluation in 1978, the exchange rate was held constant. The high rates of inflation during the period meant that the exchange rate became increasingly overvalued such that by 1982 overvaluation was estimated at 816% (Werlin, 1994). This restricted trade coupled with the misaligned exchange rate eroded the competitiveness of exports while limitation on imported inputs and consumer goods also inhibited export production and production as a whole causing extremely low capacity utilization (Ghartey, 1987). The economy experienced negative growth rate for some of the years particularly between 1978 and 1983 where the annual average real GDP growth rate was –1.34%. The other years however, experienced positive growth rates though at declining rates (World Bank, 1995).

In view of the above, the Government of Ghana launched the economic recovery programme that included restructuring the physical infrastructure and economic institutions and decreasing inflation through prudent monetary, fiscal and trade policies. The 1986 trade liberalization programme was part of the Rawlings administration's World Bank and IMF supported Economic Recovery Programme (ERP). The purpose of the liberalization policy was to open up the economy to increase competition to improve efficiency in domestic industries so as to enhance economic growth. The liberalization policy also aimed at narrowing the gap between the official and parallel exchange rate to provide foreign exchange to ease import strangulation with the objective of increasing output, particularly in the export sector (Armah, 1993). Multiple exchange rates were initially implemented to promote exports.

Included in the liberalization policy were foreign exchange liberalization, import liberalization and export diversification. To complement reform of the exchange rate system, access to the official foreign-exchange market auctions was gradually widened until there were practically no restrictions on imports into Ghana. The use of import licences was abolished in 1989 in addition to the removal of quantitative import restrictions. The tariff system was overhauled and adjusted downwards early in the adjustment programme. The tariff schedules were 10%, 20% and 30% compared with schedules of 35%, 60% and 100% prior to the period before 1982. On the export side, reforms were introduced in 1991 so that non-traditional exporters no longer had to surrender their foreign-exchange receipts to the Bank of Ghana, although the ruling still applied to gold and cocoa receipts (Jebuni, *et al*., 1994).

During the liberalization period, import volumes have increased continuously. The volume of imports increased from US$712.5 million in 1986 (representing 12.43% of GDP) to US$1728.0 million in 1993 also representing 28.51% of GDP. This was partly due to trade liberalization releasing pent-up demand. But it was also due to positive income growth rates and large capital inflows. The decline in the anti-export bias of the trade and payment regime has led to increases in export volumes particularly in the traditional sectors of cocoa, gold and timber, although there has been little in the way of export diversification. The volume of exports also rose from US$773.4 million in 1986 to US$1234.70 million in 1994 representing 13.49% of GDP and 22.63% of GDP respectively. The share of Non-traditional export has also increased averaging 5.8% between 1986 and 1995. Despite large increases in export volumes, declining terms of trade and a massive surge in externally funded imports required to increase industrial production have ensured a deficit. Meanwhile, real GDP growth from 1986 up to the latter part of the 1990s averaged 4.5% per annum and an average inflation of 29.4% from 1984–1992 and 27.9% in the 1993–2000 period. Inflation however, reached its peak of 59.5% in 1995 (WDI, 2001).

Clearly, it could be concluded from the above that the inclusion of the trade liberalization policy as part of the reform programme was a laudable decision. The dominant economic issue however, is how and how far liberalization of trade enhances the drive to rapid economic growth. It is recognized that the extent of trade liberalization differs among groups of countries and countries in the same group due to structural and economic peculiarities. Thus, a specific country analysis of the trade liberalization is justified to have a better understanding of its (i.e. trade liberalization) impact on GDP growth in individual

countries.

1.2 Statement of the Problem

The impact of trade openness on economic growth has been the subject of many discussions and studies over the last several decades. This is exemplified in many of the World Trade Organisation (WTO) Rounds.

In 1986, Ghana adopted the policy of trade liberalization as part of the reform and adjustment programmes of the Breton Wood Institutions. The objective was to open the economy to competition to enhance efficiency in domestic production which would eventually lead to growth in output, reduce the high incidence of balance of payment deficits and consequently enhance GDP growth. The adoption of the trade liberalization policy was also in response to the poor performance of the external trade sector. Hitherto, Ghana had pursued a strategy of import substitution and implemented a series of restrictive trade policies including increasing tariffs, non-tariff barriers and exchange rate controls. The restrictive trade saw a decline in the export/GDP ratio and import/GDP ratio from 20.7 to 3.6 and 18.5 to 3.3 respectively particularly for the period between 1970 and 1982. This adversely affected the growth performance of the economy. It was therefore the thought of many Ghanaians that the liberalization policy was going to alleviate the external sector of the persistent deficits so that it could play its role in enhancing GDP growth effectively.

However, after more than two decades of liberalization of the exchange rate system, import and export diversification, the growth performance of the economy has been between 4.2 % and 5.0% which is less than the targeted growth rate (Aryeetey and Fosu, 2005). Thus,

considering the purpose for which the liberalization policy was adopted as well as the growth performance of the economy and the trade/GDP ratio over the past two decades, the questions that arise are: has the liberalization policy been able to achieve its objective of reducing overall balance of payment deficits so as to stimulate GDP growth? What have been the trends in real trade balance since liberalization? What has been the impact of other key macroeconomic variables such as inflation, capital, foreign direct investment, population growth, among others on GDP growth in Ghana? This study thus attempts to analyse the impact of the trade liberalization policy as well as inflation, population growth, foreign direct investment inter alia on GDP growth in Ghana.

1.3 Objective of the Study

The general objective of the study is to analyse the impact of the trade liberalization policy on Gross Domestic Product (GDP) growth in Ghana from 1986 to 2007.

The specific objectives of the study were:

❖ To examine the impact of other key macroeconomic and policy variables on economic growth.

❖ To suggest appropriate policy measures arising from the empirical findings to support the need for or otherwise of trade liberalisation in Ghana

1.4 Study Hypothesis

The study seeks to test and validate the following empirical hypothesis

H_0: Trade openness **does not** enhance economic growth.

H_1: Trade openness enhances economic growth.

1.5 Justification for the Study

It is an indisputable fact that the target of every economy is to attain the highest possible level of growth. A rise in growth usually implies a rise in the aggregate welfare of the people. For this reason, governments of developing countries over the years have been pursuing policies that would lead to growth. Obviously, the role of free international movement of goods and services as well as factors in achieving growth cannot be overemphasized. Theory as well as empirical evidence have shown that trade liberalization and for that matter trade openness has a positive correlation with economic growth.

Ghana made an early attempt at trade liberalization between 1966 and 1972 which was not successful. However, the policy was again adopted as part of the Economic Recovery Programme (ERP) in 1983 but came into full effect in 1986 with the abolition of all quantitative controls on imports and exports as well as the liberalization of the exchange rate regime.

In view of the positive relationship between trade liberalization and growth as shown by theoretical and empirical studies, it calls for an insight into the extent to which trade liberalization has impacted on the GDP growth of Ghana since the country liberalized its trade and exchange rate in 1986, hence the justification for this study.

The study is thus anticipated to help researchers and policy makers to understand the trends and volume of exports since liberalization was adopted in Ghana. The study is also

expected to help policy makers in the review and making of new trade policies.

1.6 Scope of the Study

Conceptually, this research finds out the impact of trade liberalization on Gross Domestic Product (GDP) growth in Ghana. It includes theoretical and empirical discussions of trade, trade openness and economic growth. It also gives a background discussion on trade liberalization and export-led growth. The study finally highlights on trade policy and performance in Sub-Saharan African countries.

The study was limited to the period 1986 – 2007. This period is chosen because it was during this period that the policy actually took full effect with the abolition of all quantitative control on both imports and exports as well as liberalization of the exchange rate.

1.7 Organisation of the Study

The study was organised into five main chapters with each chapter further divided into sections and sub-sections. The first chapter deals with the general introduction to the study. Chapter two reviews both the theoretical and empirical literature on trade, trade liberalization and economic growth. Chapter three focuses on the specification of the empirical model used for the study. The results of the data collected for the study were analysed and discussed in the fourth chapter. The fifth chapter presents the summary of findings, policy implications, recommendations and conclusion of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter focuses on the review of relevant literature on trade and economic growth. The chapter consists of three broad sections. The first section reviews the theoretical literature on trade and economic growth with emphasis on the traditional explanation of trade and growth, trade and technological change and as well as trade, rivalry and technological innovation and trade liberalization and export-led growth. Section two deals with the review of empirical work on trade, trade liberalisation and economic growth. The third section presents a review of trade policies and performance in Sub-Saharan African countries.

2.1 Theoretical Literature

Traditional explanations of trade as "the engine of growth" and the impact of trade on economic development are rooted in the principles of comparative advantage. The theory of comparative advantage arises from nineteenth century free trade models associated with David Ricardo and John Stuart Mill, which were modified by trade theories embodied in the factor proportions or Hechsher–Ohlin Theory (1933) and Stolper-Samuelson (1941) and Rybzsnski Effects (1955). These trade models collectively and in various ways predict

that an economy will tend to be relatively effective at producing goods that are intensive in the factors with which the country is relatively well endowed. In other words, comparative advantage provides that when nations specialize, they become more efficient in producing a product (and indeed a service), and thus if they can trade for their other needs, they and the world will benefit.

Figure 2.1 below captures the essential elements of trade and specialization and related gains using a two-country, two-good model.
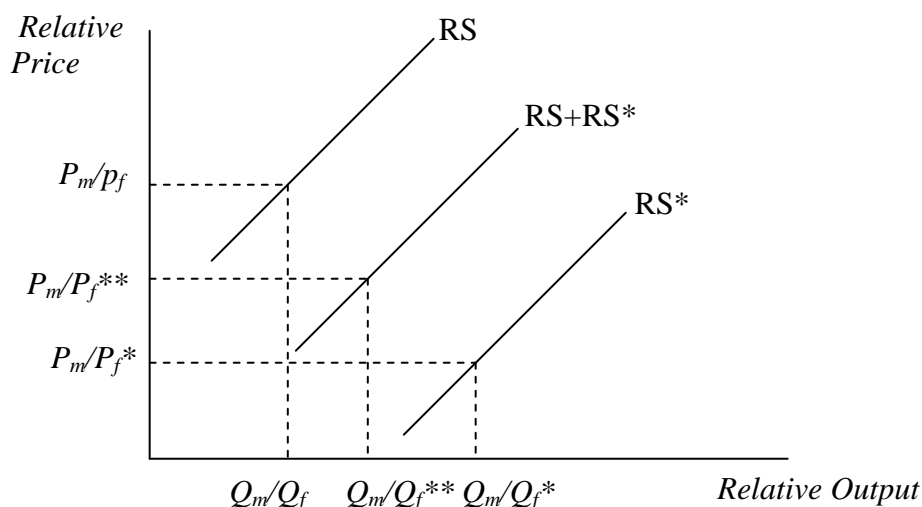
Fig 2.1 Gains from Trade in a Two-country Two-good Model

The model depicts two countries (home and foreign countries) and two goods, food and manufactures before and after trade. The *y-axis* depicts the relative price while the *x-axis* shows the relative output. Home country has comparative advantage in producing food but also produces manufactures, while the foreign country has comparative advantage in

manufactures but also produces food. Under autarky (no trade), the relative price in the home country is P_m/P_f, facilitating relative supply (RS) of Q_m/Q_f on the RS curve, and that in the foreign country is Pm/Pf * facilitating relative supply of Q_m/Q_f* on the RS* curve. When the two countries trade, the home country exports food to the foreign country and imports manufactures. The relative price (P_m/P_f) in the home country drops because the price of food (P_f) increases due to the reduced supply of food in the home country while the relative supply of manufactures increases. Changes occur in the foreign country when it imports food from the home country as increase in food suppliers bring down the price of food, causing the relative price P_m/P_f* to rise in the foreign country. The equilibrium relative price converges at P_m/P_f** on the *RS+RS** curve. This is the efficiency price that generates the relative supply of Q_m/Q_f**, where the home country produces the efficient level of food and the foreign country produces the efficient level of manufactures as a result of trade and specialization. The two countries eliminate unnecessary capacity in their respective economies. Trade has the impact of integrating the two economies since through exchange they produce the economically efficient levels of both food and manufactures.

The principles portrayed in the above model are also in line with the theories advanced in early writings by John Stuart Mill, stating that trade, according to comparative advantage, results in a more efficient employment of the productive forces of the world. According to Mill, this was considered as the direct economic advantage of international trade (Meier, 1995).

On the other hand, trade restrictions or barriers are associated with reduced growth rates and social welfare and countries with higher degrees of protectionism, on average, tend to grow at a much slower pace than countries with fewer trade restrictions. This is because tariffs reflect additional direct costs that producers have to absorb which could reduce output and growth. The cost of a prohibitive tariff or quantitative restriction on a hypothetical country and the world economy is demonstrated graphically in Figure 2.2.

With free trade, both foreign suppliers and local producers would be willing to supply country X (a large importer) the combined output of product Q at the world price of Pw. If country X imposes a tariff or quota, however, total demand for product Q is reduced from Q to MQ. This drives down the world market price from the equilibrium price of Pw to the new world price of Pw' while at the same time pushing the price facing local consumers in country X to the higher price of Pt.

It can thus be seen that the tariff or restriction is welfare reducing at the global level as it results in lower prices for exporters (who may have to face collapse) while country X's consumers face unjustifiably higher prices at Pt. A narrow group of local suppliers or a rent seeking monopolist would, however, register a gain in that due to the tariff or quantitative restriction, they earn a premium of $Pt - Pw'$ and total rents amounting to $(Pt - Pw') \times OMQ$.
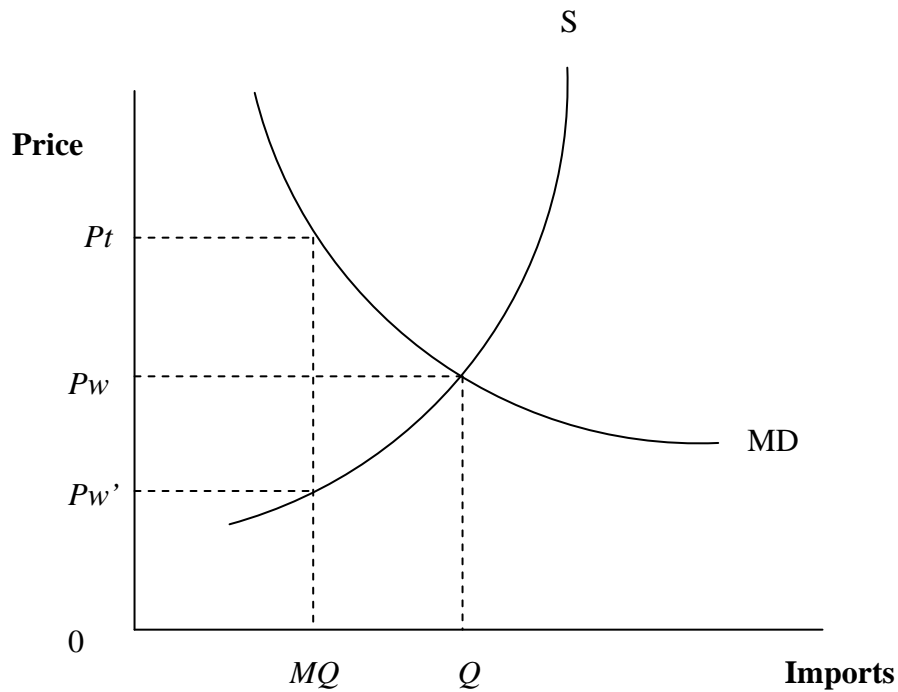
Figure 2.2 Impact of prohibitive tariff or restriction

The dynamic effects are that world supply would decline as producers from the rest of the world cut back supply in response to the lower price and the monopolist local suppliers have no incentive to increase output, since they can enjoy premium revenues without expanding output. This results in reduction of overall growth.

The model being examined predicts that protectionist measures in the form of tariffs or quotas could lead to reduced output and export growth and overall welfare. The direct implication of these conclusions is that unrestricted trade would tend to be associated with higher levels of growth.

Specialisation on the basis of comparative advantage enables the maximum level of output to be produced from a given amount of factor resources. Production increases, consumption increases, and therefore global welfare increases.

There is nothing in the doctrine of comparative advantage however, that guarantees an equal or equitable distribution of the gains from trade. It depends on the international rate of exchange between the two goods, on what happens to the terms of trade, and on whether the full employment of resources is maintained as resources are reallocated as countries specialise. As to which country benefits most from specialisation depends on how close the international rate of exchange is to the domestic transformation ratio between the two goods. The closer is the international rate of exchange to a country's own internal rate of exchange, the less it will benefit from specialisation and the more the other country will benefit. In extreme circumstances one country may become absolutely worse off if the real resource gains from trade are offset by a decline in the terms of trade. This is the case of 'immisering growth' first demonstrated by Bhagwati (1958).

In considering the distribution of the gains from trade between developing and developed countries, the problem for many developing countries is that the nature of the goods that

they are 'forced' to specialise in under the aegis of free trade have characteristics which may cause both the terms of trade to deteriorate and the unemployment of resources.

Firstly, primary commodities have both a low price and income elasticity of demand which means that when supply increases prices can drop dramatically, and demand grows only slowly with income growth.

Secondly, primary commodities are land-based activities and subject to diminishing returns, and there is a limit to employment in diminishing returns activities set by the point where the marginal product of labour falls to the minimum subsistence wage. No such problem arises in manufacturing, such as cloth production, where no fixed factors of production are involved, and production may be subject to increasing returns. The preservation of full employment in both activities, as resource reallocation takes place, implicitly assumes non-diminishing returns in both activities; that is, constant or decreasing costs.

In practice, for countries specialising in diminishing returns activities, it is possible that the real resource gains from specialisation may be offset by the real income losses from unemployment. In this case, complete specialisation and free trade would not be optimal.

Now consider the dynamic gains from specialisation and trade. The essence of dynamic gains is that they increase the productive capacity of the economy by augmenting the availability of resources for production through increasing the productivity of resources

and increasing their quantity. One of the major dynamic benefits of trade is that export markets widen the total market for a country's producers. If production is subject to increasing returns, export growth becomes a continual source of productivity growth. There is also a close connection between increasing returns and the accumulation of capital. For a small country with no trade there is very little scope for large scale investment in advanced capital equipment; specialisation is limited by the extent of the market.

But if a poor small country can trade, there is some prospect of industrialisation and of dispensing with traditional methods of production. It is worth remembering that at least 60 countries in the world classified as developing, and 31 in Africa, have populations of less than 15 million. Without export markets, the production of many goods would not be economically viable.

Other important dynamic benefits from specialisation and trade consist of the stimulus to competition; the acquisition of new knowledge, new ideas and the dissemination of technical knowledge; the possibility of accompanying capital flows through foreign direct investment, and changes in attitudes and institutions. In the context of 'new' growth theory, these are all forms of externalities which keep the marginal product of physical capital from falling, so that trade improves the long run growth performance of countries.

Under endogenous models, growth reflects the contribution to productivity from structural and governance reforms on the one hand, and the adoption of new technology on the other. Trade is seen as affecting long run growth through its impact on technological change.

Endogenous growth models, therefore, hold that trade provides access to imported products, which embody that new technology. Additionally, trade alters (mainly increases) the effective size of the market facing producers which raises returns to innovation; and affects a country's specialization in research-intensive technologies and production systems.

These principles reflect what John Stuart Mill had earlier referred to as the important indirect effects of trade which must also be counted as promoting development. These benefits were of three kinds:

1. Those that increase the extent of the market, induce innovations and increase productivity;

2. Those that increase capital accumulation and savings;

3. Those that have an educative effect in instilling new wants and in transferring technology, skills and entrepreneurship.

The emphasis is on the fact that trade gives a poor country the opportunity to remove domestic shortages, to overcome the diseconomies of a small domestic market and accelerate the learning rate of the economy. Mill concluded that if trade increases the capacity for development, then the larger the volume of trade, the greater the potential for development (Meier, 1995).

It is important to emphasize that the extent of rivalry and competition is also a key determinant of innovation activities among firms in an economy. Openness and international competition increases rivalry among firms in the domestic economy and with

outside producers which stimulates innovation leading to efficient production systems and growth.

By contrast, protectionist policies that restrict trade keep out the competition and this would result in reduced innovation and slow down growth. A wide range of empirical research has supported the hypothesis that increased international rivalry and competition results in technological innovation.

Trade liberalisation does not necessarily imply faster export growth, but in practice the two appear to be highly correlated. The impact of trade liberalisation on economic growth outlined in the previous and subsequent sections probably works mainly through improving efficiency and stimulating exports which have powerful effects on both supply and demand within an economy. There are several different measures of trade liberalisation or trade orientation, and all studies seem to show a positive effect of liberalisation on economic performance. Likewise there are several different studies of the relation between exports and growth and the evidence seems overwhelming that the two are highly correlated in a causal sense, but the relative importance of the precise mechanisms by which export growth impacts on economic growth are not always easy to discern or quantify. There are several possible measures of trade liberalisation or outward-orientation, and many investigators and organisations (e.g. Leamer, 1988; World Bank, 1987) devise their own measures.

Some of the most common measures used are: the average import tariff; an average index of nontariff barriers; exports plus imports to GDP ratio; an index of effective protection; an index of relative price distortions or exchange rate misalignment, and the average black

market exchange rate premium. In 1987, the World Bank classified a group of 41 developing countries according to their trade orientation in order to compare the performance of countries with different degrees of outward/inward orientation. Four categories of countries were identified:

i. Strongly outward oriented countries where there are very few trade or foreign exchange controls and trade and industrial policies do not discriminate between production for the home market and exports, and between purchases of domestic goods and foreign goods.

ii. Moderately outward oriented countries, where the overall incentive structure is moderately biased towards the production of goods for the home market rather than for export, and favours the purchase of domestic goods.

iii. Moderately inward oriented countries where there is a more definite bias against exports and in favour of import substitution.

iv. Strongly inward oriented countries where trade controls and the incentive structures strongly favour production for the domestic market and discriminate strongly against imports.

2.2 Empirical Review

Some economists consider that liberalization of trade leads to the economic development. They believe that inefficient trade policies are caused by the departure from economic theory, its misinterpretation and mistakes in the policy implementation. Other scholars put the development ahead of trade regime policy: each country has to identify its own model

of development, then what institutional reforms has to be adopted, where trade regime/liberalization is a part of such reforms.

The World Bank found in 1990s that the increase of trade-to-GDP ratios made an increase of 5 percent of income per capita for about 3 billion people. It concludes that countries which do open up, increase their growth rates. The IMF considers that low level of trade makes countries more volatile to debt crises. It recognizes that the debt services of the least developed countries are in large due to the low export revenues.

The discussions about trade liberalization reached their top in the last few years, especially after the large-scale anti-globalization protests in Seattle, Washington and Brussels. This is why now more and more researchers incorporate in their papers concerns of various opposition groups to the trade liberalization at all means.

Yanikkaya (2003) estimated the effect of trade liberalization on per capita income growth for 120 countries for the period 1970 to 1997. He used two types of trade openness measures. The first openness measure was estimated by using trade volumes which include different ratios of trade variables (exports, imports, exports plus imports and trade with developed countries) with GDP. Another measure based on trade restrictiveness estimated by calculating restrictions on foreign exchange on bilateral payments and current transactions. The results of the Generalize Method of Movement (GMM) estimates showed that first group of openness, based on trade volumes were significant and positively related with per capita growth. However, for developing countries, openness based on trade

restrictions was also significant and positively related with per capita growth. He therefore concluded that trade restrictions in developing countries may cause faster GDP growth.

Using the model of Sinha and Sinha (2000) which states that GDP growth has three components namely, trade growth, investment growth and population growth, Siddiqui and Iqbal (2005) estimated the impact of trade liberalization on output growth for Pakistan. The volume of trade (import plus export) is used as proxy of openness and for that matter the degree of liberalization.

In their study, the estimated co-integration equations for the model showed that there is long-run negative relationship between trade growth and GDP growth. However, when they separated the total trade volume in export and import, they found insignificant positive relationship between GDP growth and export and import. Both models showed positive and significant relationship between GDP growth and investment as well as GDP growth and population growth. The Granger Causality tests also showed insignificant relationship between trade growth and GDP growth while investment growth and population growth were found to have a significant relationship with GDP growth.

Edward (1992) used a cross country data set to analyse the relations between trade openness (trade intervention and distortions) and GDP growth of 30 developing countries over the period 1970 to 1982. In his model he used two basic sets of trade policy indicators, constructed by Leamer (1988). The first set refers to openness and measures of trade policy (tariff and Non- Tariff Barriers - NTB) which restrict imports. The second set measures

trade intervention and captured the extent to which trade policy distorted trade. The results of the model, estimated by OLS, showed that all the four openness indicators were positively related with real per capita GDP growth, while trade intervention indexes were found to be significant and negatively associated with GDP growth. These studies support the hypothesis that countries with a more open trade regime have tended to grow faster, and a more distorted trade regime will tend to grow slower.

Santos-Paulino (2002) examined the impact of trade liberalization on export growth for a sample of 22 developing economies between 1972 to 1998. He used a typical export growth function which postulates that exports volume depends upon real exchange rate and world income. Trade openness is measured in two ways. First by the ratio of export duties to total export, as indicator of the degree of anti-export bias and second by a dummy variable of timing of the introduction of trade liberalization measures. The results of OLS estimate showed export duty significant with negative sign and the dummy variable is also significant with a positive sign. Therefore it was concluded that exports grow faster in open economies.

Wacziarg (2001) investigated the links between trade policy and GDP growth in a panel of 57 countries for the period of 1970 to 1989. His study employs a fully specified empirical model to evaluate the six channels though which trade policy might affect growth. He measured openness through an index which consisted of three trade policy variables, Tariff barrier, captured by share of import duties to total imports, Non-tariff barriers, captured by un-weighted coverage ratio for the pre-Uruguay Round time period and a dummy variable

(liberalization status). The fixed estimate OLS results showed that three channel variables i.e., FDI inflows as share of GDP, domestic investment rate and macroeconomic policy, were significant. He therefore concluded that there is a positive relationship between trade openness and GDP growth.

Edwards (1998) used comparative data for 93 countries to analyse the robustness of the relationship between openness and total factor productivity (TFP) growth. He used nine indexes of trade policy to analyse the connection between trade policy and TFP growth for the period1980 to 1990. Among these nine indexes, three were related to openness, a higher value of which denotes a lower degree of policy intervention in international trade. The other six were related to trade distortions, for which higher values denote a greater departure from free trade. The results of OLS estimates found trade openness indexes significant with positive signs and trade distortion indexes were significant with negative signs. This relationship suggests that more open countries will tend to experience faster productivity growth than more protectionist countries. The important point of the study was that the coefficients were very small, up to 100th decimals points, while the value of R^2 was also very low.

Harrison (1996) used a general production function to analyse the relationship between openness and GDP growth. He specified GDP as a function of capital stock, years of primary and secondary education, population, labour force, arable land and technological changes. He used seven openness measures to test the statistical relationship between openness and GDP growth. The cross-section estimation results show only black market rate significant with negative sign. The country time series panel result showed that three variable, tariff and non-

tariff barriers with positive sign, black market rate and price distortion index used in dollar with negative sign, were found significant. Estimation for Annual data show two variables, tariff and non-tariff barriers, and black market rate, significant with negative sign. Population, labour force and technology were also found to have positive and significant. He therefore concluded that the choice of period for analysis, of relationship between trade openness measures and GDP growth, is critical.

Using data for 87 countries, Hakura and Jaumotte (1999) find that trade indeed serves as an important way for the international transfer of technology to developing countries. The authors show that intra-industry trade plays a more important role in technology transfer than inter-industry trade. Intra-industry trade is more pervasive among developed countries, and inter-industry is more prominent in trade between developed and developing countries. Developing countries will enjoy relatively less technology transfer from trade than developed countries.

Rivera-Batiz (1996) describes a model depicting two identical economies operating under autarchy and then subsequently engaging in trade to establish the impacts of trade on technological innovation and productivity growth within the endogenous growth framework. In this framework, there is only one homogenous final good, which is an intermediate or capital good. The assumption was that without trade, the two economies are producing capital goods which are totally differentiated from each other. When the two countries engage in trade, each has available the ideas of the other, represented by the stock of blueprints for the capital goods. The larger body of ideas and knowledge doubles the rate of innovation and results in productivity growth in both economies. Rivera-Batiz adds that

the effects of trade on growth will depend very much on the extent to which the national innovation system can effectively use the new information and blueprints to generate new products. If the specialized human capital required to use the new ideas and blueprints is not available or is limited, the growth effects from trade in intermediate goods would not be substantial. Whatever the extent of the impact of the new knowledge on innovation, the model suggests a definite positive impact of trade on medium and long-term growth.

Ahmed, Y. and Anoruo, E. (2000) investigated long run relationship between GDP growth and openness for five South East Asian countries, namely, the Philippines, Indonesia, Malaysia, Singapore and Thailand for the period 1960 to 1997. They used export plus import growth rate as proxy of openness. The Johansan estimation results rejected the hypothesis that there is no cointegration between economic growth (GDP) and openness while the hypothesis that error correction term is significant could not be rejected. This Vector Error Correction estimates showed bi-direction causality between economic growth and trade openness.

Sinha D., Sinha T. (2000) analyzed the effects of growth of trade openness and investment on the growth of GDP for 15 Asian countries during 1950 to 1992. They developed a model which specified GDP growth a function of growth rates of openness (export plus import), domestic investment and population. The Auto Regressive Model (ARMA) results show that for China, Hong Kong, Iran, Iraq, Israel, Myanmar, Pakistan and Singapore, the coefficient of the growth of openness is positive and significantly different from zero. For

China, Hong Kong, Indonesia, Israel, Japan, Jordan, Philippines, Singapore and South Korea, the coefficient of the growth of domestic investment is positive and significantly different from zero. In some cases, the coefficient of the growth of population is negative but in all such cases, it is not significantly different from zero. Thus, they find support for the proposition that the growth rate of GDP is positively related to the growth rates of openness and domestic investment. However, the relationship between the growth rate of GDP and the growth rate of population is not that clear cut.

Harrison (1991) also has pointed out that the new growth or endogenous growth theorists do not predict that free trade will unambiguously raise economic growth. She adds that increased competition could, for example, discourage innovation by lowering expected profits. Grossman and Helpman (1991) also pointed out that one of the key inputs to a country's innovation system is human capital and the amount of human capital allocated to innovation is closely reflected in technological change in the economy. Trade could constrain innovation and growth if it tends to shift human capital from research and development activities to other sectors of the economy to meet the human capital needs of direct production activities. In countries with scarce skilled human capital, this would drive human capital away from research and development, reducing innovation and growth.

The situation described above is particularly the case when the country's major exports are human capital intensive. For countries which export products with lower human capital content, trade liberalization and integration with the rest of the world helps to reduce derived demand for human capital and thereby lowers the cost of innovation. Grossman

and Helpman concluded that in such countries, the indirect gain from trade is to encourage growth. Cantwell (1992) added that a country wishing to capture the benefits of new ideas generated by trade will need to develop its national innovation system defined as the network of institutions that support the initiation, modification and diffusion of new technologies. The pre-condition for such an innovation system is an adequate pool of human capital and institutional capacity in the country.

Porter (1990), in a wide ranging study on innovation and competition, concluded that "competitive advantage emerges from pressure, challenge, and adversity, which are powerful motivations for change and innovation." He added that protection, in its various forms, insulates domestic firms from the pressure of international competition. Sherer (1986) has also noted that most observers cannot escape acknowledging the invigorating effect rivalry commonly has on industrial firm's research and development efforts.

Rivera-Batiz (1995) presented a simple model showing the mechanisms through which trade generates innovation. He demonstrated that by augmenting the rivalry facing producers in the local market, trade could induce domestic producers to increase their Research & Development activities leading to greater innovation and raising domestic total factor productivity. The model presented in Rivera-Batiz's paper incorporates gains from trade related to increased domestic productivity and economic growth associated with foreign competition. Studies of long run growth also suggest that the invention and development of new goods and inputs constitute one of the major sources of economic

growth. If trade stimulates competition leading to the creation of new inputs and products, long term growth will arise.

In 1997, two years before the Seattle WTO trade negotiations, Anne Krueger in her paper *Trade policy and economic development: how we learn* addresses the relation between trade and economic growth. Krueger states that trade policies play a crucial role in the economic development in the past and in our days. The author provides a historical overview of trade policy concepts widely accepted by economists and governments. She states that in 1950s and 1960s the concept of import-substitution policy was wide spread and it was believed to be a vehicle for the economic development in the "third-world". It was thought that through new manufacturing industries (or infant industries), developing countries could substitute imports of industrial goods and these industries should be protected in their initial stage. Some countries created state-owned enterprises in the new industries and provided direct investment for them. In the same period, some countries adopted another protectionist measure – sustaining a fixed nominal exchange rate. Thus, it was considered that by having such policy the imports of capital goods would be cheaper and this would attract investment. Krueger describes that import-substitution proved to be inefficient in many countries and it was chipper, in some cases (Pakistan), to "pay workers to stay home and import the final products" than to produce locally. Then, the author describes the East Asian "miracle" as trade policy that was opposite to the import-substitution. Korea, Taiwan, Singapore, Hong Kong encouraged exporting strategies. Thus, the author says, countries moved from a "static" [inward oriented] to "dynamic" [outward oriented] strategies of trade regimes.

Nugent (2002) in his paper *Trade Liberalization: Winners and Losers, Success and Failures* concludes that fewer countries have liberalized their trade that has been expected and those countries that have undertaken trade liberalization policies have implemented them partially or tentatively. He also finds that many countries that liberalized trade had many negative effects. Nugent states that although least developed countries (LDCs) had concerns regarding trade liberalization that it would deteriorate their primary exports, it would have harmful effect of dependence on allegedly endemically unstable exports, that rich countries would benefit more and the main beneficiaries in LDCs could be multinational companies (MNCs). The author believes that the debt crises in LDCs in the mid-1980s made them "unusually susceptible to the trade liberalization policy advice coming from international donor organizations, especially the World Bank and International Monetary Fund". He attributes trade liberalization as one of the important elements that, along with other reforms, constituted in early 1990s the "Washington Consensus".

Nugent again considers that countries that pursued trade liberalization had to choose from mainly two strategies. First, was a more radical path—removing exchange rate distortions, non-tariffs barriers to imports; reducing tariffs and harmonizing them among different categories of merchandise and services; abandoning import licensing; privatizing foreign trade; eliminating export tariffs and, finally, joining the World Trade Organization. The second strategy had elements of partiality: high rates of protective tariffs and subsidies for exports and establishing Export Processing Zones. Studying the trade liberalization policies

in Australia, Bolivia, Chile, Korea, Mauritius, Mexico, Morocco, Spain, Taiwan, Turkey in late 1970s and 1980s, as well in Central and Eastern Europe in late 1980s-beginning of 1990s, Nugent concludes that obstacles to a successful trade liberalization process are "embedded in deep institutional problems". He also finds that the trade liberalization was successfully implemented in countries where this process was sustained through consistent policies of the government (Chile, Taiwan, and Korea) for a long period of time.

Most successful cases show that governments managed to minimize negative effects resulted from the liberalization of trade. Nugent points out what are major obstacles for promoting openness in LDCs that have not undertaken trade liberalization (South Asia, Sub-Sahara Africa and the Middle East): concerns of government revenue shortfalls, high unemployment rates; social negative impact for 'losers' of trade liberalization; increased pollution and environment degradation. Also, as experience shows in other countries, benefits of liberalization go primarily to foreign entities present in LDCs or/and to large domestic firms. Small and medium size enterprises usually are among losers of trade liberalization in the first stage of implementation of such policy, especially small farms.

In their paper *International Trade and Productivity Growth: Exploring the Sectoral Effects for Developing Counties*, Choudhri and Hakura (2000) came to a conclusion that openness to trade has different effects on productivity growth in different sectors. It mostly depends on the growth potential of the sector. For example, in low-growth manufacturing sectors, the increasing of international trade has little effect on productivity growth. The paper suggests that medium-growth and high-growth sectors obtain a greater benefit from import

competition; it has a significant effect on growth in these sectors and indirectly on the overall economic growth of the country. The authors found that for developing countries where low-growth sectors are present, the governments have to concentrate on stimulating the development of other sectors through technology transfers to medium-growth manufacturing. Thus, the authors advised, the high import tariffs for equipment and machinery in sectors that have a potential growth would have a negative effect for the country's economic development.

In a major study of trade orientation, distortions and growth in developing countries, Edwards (1992) develops a model which assumes that more open economies are more efficient at absorbing exogenously generated technology. Using nine indicators of trade orientation constructed by Leamer (1988), he shows for a sample of 30 developing countries over the period 1970-82, that more open economies tend to grow faster. To test the hypothesis, a conventional growth equation is used relating the growth of per capita income of countries to their investment ratio; their initial level of per capita income as a proxy for technological backwardness, and a measure of trade distortion.

All but one of the trade distortion measures produce a significant negative coefficient, and the findings are robust with respect to the sample taken, the time period taken and the method of estimation. The findings are also robust to some of the alternative indicators of trade liberalization and distortion mentioned at the beginning. In Edward's model, however, the only channel through which trade liberalisation enhances growth is through

the absorption of foreign technology. This is undoubtedly important, but there are other important mechanisms.

In another comprehensive study, Dollar (1992) addresses the question of whether outward oriented developing countries grow more rapidly – taking as his sample 95 countries over the period 1976-1985. Trade orientation is measured by the degree to which the real exchange rate is distorted by not reflecting differences in the price level between countries. High relative prices indicate strong protection and incentives geared to production for the home market. Taking different continents, and comparing them with the successful economies of Asia, he finds that in Latin America the exchange rate was overvalued by 33 percent during this period, and in Africa by 86 percent. Growth equations are estimated across countries using each country's measure of exchange rate distortion, controlling for differences in the level of investment and the variability of the exchange rate. Dollar finds that, on average, trade distortions in Africa and Latin America reduced the growth of income per head by between 1.5 and 2.1 percent per annum. The results cannot be considered as conclusive because exchange rate distortions are likely to be correlated with other (internal) variables that impair growth performance, but they are certainly suggestive.

Brahmbhatt and Dadush (1996) at the IMF have recently developed a speed of integration index based on four indicators: (i) the ratio of exports and imports to GDP (the Vamvakidis measure of openness); (ii) the ratio of foreign direct investment to GDP; (iii) the share of manufactures in total exports, and (iv) a country's credit rating. They then divide a sample of 93 countries into four groups – fast, moderate, weak and slow integrators – and find that

the fast integrators include most of the rapidly growing East Asian exporting economies, while the weakly and slowly integrating group include most of the low income countries of sub-Saharan Africa and some of the middle-income countries of Latin America.

The high performance Asian countries are perhaps the most spectacular examples of economic success linked to exports (notwithstanding the recent crisis in East Asia). The economies of Japan, South Korea, Taiwan, Singapore, Hong Kong, Malaysia, Indonesia and Thailand have recorded some of the highest GDP growth rates in the world – averaging approximately 6 percent per annum since 1965 – and also some of the highest rates of export growth, averaging more than 10 percent per annum. It should be noted, however, that this success has not always been based on free trade and laissez-faire. Japan and South Korea, for example, have been very interventionist, pursuing relentless export promotion but also import substitution at the same time. Indeed, in their meticulous study of *The East Asia Miracle*, the World Bank (1993) concluded that there is no single East Asian model. What is important for growth is not whether the free market rules or the government intervenes, but getting the fundamentals for growth right. Three policies are identified as contributing to the success of these 'tiger' economies: firstly, industrial policies to promote particular sectors of the economy; secondly, government control of financial markets to lower the cost of capital and to direct credit to strategic sectors, and thirdly, policies to promote exports and protect domestic industry. Crucial to all three policies is good governance. The World Bank concedes that most of the countries deviated from free market economics, but deviated less than other developing countries, and got the fundamentals right (such as high levels of human and physical capital accumulation).

The fact remains that none of these countries could have grown as rapidly as they did without the rapid growth of exports. Apart from the externalities associated with trade and the encouragement of domestic and foreign investment, they simply would not have had the foreign exchange to pay for all the import requirements associated with rapid growth.

2.3 Trade Policy and Performance in African Countries

In Africa and other developing regions trade plays a quantitatively important role. Thus, a larger share of their income is spent on imports and a large share of their output is exported, than is the case for developed countries with similar economic size. In fact it is natural that the larger a country's GDP, the smaller its trade ratios. Most African countries have high ratios of external trade to GDP, which makes trade policy vital to the functioning and prospects of their economies. In Nigeria for example, the percentage contribution of foreign trade to GDP rose from 35 percent in 1960 to over 60 percent in the 1980s and over 75 percent in the 1990s. Other African countries depict similar characteristics. For example, in 1997, the trade to GDP ratio for Botswana was 88 percent and that for Zambia was 66 percent. The comparative ratios for the developed countries were 28 percent for the UK, 11 percent for the United States and 9 percent for Japan (World Development Indicators, 1998).

Prior to political independence, trade policies of most African countries were formulated as an integral part of colonial trade policies. They were aimed at promoting and regulating trade to serve the metropolitan country. These policies forged strong trade ties between the colonies and the metropolitan countries, effectively monopolizing the colonies' external

trade. Special licenses had to be issued to obtain goods from outside the realm of the colonizers and usually these could only be obtained where the goods in question were not available in the metropolitan country. One would say that African countries received their lessons in trade policy and practices from the metropolitan country, which in many countries have persisted over time.

Trade policy in many African countries has been dominated by significant restrictions. African countries' protectionist trade policies were initially influenced by the perceived need to stimulate local industrial development, under the banner of import substitution and infant industry protection.

In many African countries, tariffs and quantitative restrictions have contributed the most important form of trade restriction. A large proportion of imports into Africa was either subjected to outright prohibition or high tariffs or some sort of import ban or licensing mechanism. Usually an industry can be protected from imports by the use of any one of these measures. For example, applying a quantitative restriction or a tariff. Trade barriers in Africa were, however, excessive in that countries applied quantitative restrictions, tariffs, licensing, import bans, and foreign exchange regulations to control the flow of imports and exports. Protectionist policies were actually instituted to totally block imports into the countries, except those deemed as priorities by the government and obtainable through elaborate licensing arrangements.

Ngy and Yeats (1998) computed average tariffs and non-tariff barriers (NTBs) imposed on imports from OECD countries by African countries, and established that these were relatively high compared to a group of fastest growing exporters.

As indicated in Table 2.1 below, African countries maintained average tariffs of 26.8 percent compared to the 8.7 percent by the group of fastest growing exporting countries. The comparable figure was 3.4 percent for the higher income non- OECD exporters. This trend is repeated with respect to non-tariff barriers. The average coverage ratio of Non-Trade Barriers (NTBs) to tariffs for the Sub-Saharan African countries was 34 percent (for the low income countries even higher at 40.6 percent) compared to 3.7 percent for the fastest growing exporters, and 4.0 for the non-OECD exporting countries.

Table 2.1 African Trade Barriers compared with other Exporters

Exporting Countries	OECD Imports (1990-96)	1964-92 import Growth rate	Tariff levels of exporters	NTB coverage ratio
All Sub-African Africa	15,146	5.41	26.8	34.1
Low income	11,433	5.21	28.6	40.6
Middle Income	3,713	6.08	20.9	12.5
Fast growing Exporters	271,157	16.77	8.7	3.7

Korea	44,839	24.61	11.1	2.6
Singapore	28,064	22.66	0.4	0.3
Taiwan	56,046	20.47	9.7	11.2
Hong Kong	26,178	13.65	0.0	0.5
Mexico	42,635	13.83	13.4	3.9
Bahrain	471	20.62	7.1	1.5
High Income Non-OECD	105,364	18.18	3.4	4.0

Source: Ngy and Yeats (1998)

In many countries, exports were subjected to similar measures, with rules making it illegal to export "strategic" items or subjecting exports to high taxes. Special marketing agencies and boards were instituted to ensure compliance. In some countries, farmers or traders needed to obtain special permits to export surplus agricultural or "controlled" products. The most cited example of the adverse effects of high protection is exemplified by the tale of two neighbours, Ghana and Cote d'Ivoire. In Ghana, import prohibitions in the 1960s and 1970s encouraged inefficient high cost production in manufacturing industries; controls and taxes on the main export crop cocoa discouraged its production and other crops were adversely affected by the unfavourable exchange rate. Cote d'Ivoire on the other hand pursued an open policy with minimum quantitative restrictions that encouraged the development of both primary and manufactured goods. As a result, it increased its share in world cocoa exports, developed new primary exports and expanded manufacturing industries. Differences in policies applied may largely explain that between 1960 and 1978, per capita incomes fell from $ 430 to $390 in Ghana, as compared to an increase from $ 540 to $840 in Cote d'Ivoire (Meier, 1996). This occurred, in spite of the two countries

having similar resource endowments, and at the time of independence, Ghana having the advantage of a higher educational level.

Table 2.2 indicates average tariffs on selected items in a number of African countries in 1990-96. The table reveals that tariffs on agricultural materials for all Sub-Saharan Africa averaged 23%, while fast growing exporters had average tariff rates of 7.3 percent. Corresponding rates for crude fertilizers averaged 17%, compared to 4.7% for the fastest growing exporters. The average rates for all categories of goods, including final goods, were 26.7% for Sub-Saharan Africa and 10.8% for the fastest growing exporters.

Ngy and Yeats (1998) point out that the high levels of tariffs and trade restrictions were instrumental in keeping the cost of important inputs beyond the reach of most local producers and exporters. The tariffs on production equipment and other goods and services that are often employed as key inputs in agriculture and manufacturing activity, exaggerated the additional costs that potential exporters had to absorb to compete in foreign markets. The tariffs also inflated the associated costs of transport and utilities that also enter manufacturing and agriculture.

Table 2.2 Average Percentage Tariffs in selected African countries (1990-1996)

Country	Agric Materials	Chemicals	Electric Machines	Transport Equipment	All items
Angola	8.2	9.2	17.4	6.2	11.6
Malawi	3.9	9.7	23.8	7.8	15.2
Mozambique	16.2	10.3	11.5	16.2	15.6
Tanzania	29.6	22.2	27.5	13.7	29.8
Zambia	25.1	20.3	33.4	17.4	29.9

Zimbabwe	1.4	3.7	15.4	7.8	10.1
Cote d'Ivoire	9.3	20.7	25.4	17.4	23.3
Senegal	39.9	7.7	14.6	14	12.3
Uganda	26.1	12.3	17.8	14.3	17.1
Nigeria	25.0	22.2	31.4	22.7	32.8
Ghana	10.0	9.4	7.0	7.0	8.9
All other Sub-Saharan Africa	23.6	19.8	28.5	18.9	26.7

Source: Ngy and Yeats (1998)

Oyejide (1997) also points out that the impact of the restrictive measures was to produce a large anti-export bias in the African countries. More specifically, restrictions on imports translate effectively into a tax on exports; by making import substitutes effectively more profitable, they increase the cost and reduce the availability of imported inputs which enter the production of exports, thus forcing exporters to use expensive inputs of doubtful quality. Import restrictions also made exporters face more appreciated exchange rates than would have been the case in their absence. Oyejide concludes that these elements combined to reduce the international competitiveness of the export sectors of the African countries- and subsequently reduced exports and GDP growth

Rodrik (1998) examined the role of trade and trade policy in achieving sustained long-term growth in African countries and concluded that high levels of trade restrictions have been an important obstacle to export performance and growth in Africa. He contends that the reduction of these restrictions can be expected to result in significantly improved trade

performance in the region. To examine the differences in regional policies and impacts, Rodrik also makes a cross comparison of trade policies in Sub-Saharan Africa with East Asia and Latin American countries using simple averages of tariff rates and coverage ratios of non-tariff measures (on intermediate and capital goods). There are three major findings emerging from the comparisons. Firstly that government imposed trade barriers have generally been higher in Africa than East Asia, though the differences are not large. Secondly, until the early 1990s, trade barriers in Sub-Saharan Africa were comparable in magnitude to those prevailing in Latin America. Thirdly, the trade reforms that have occurred in Latin American economies – as well as in many former socialist economies in Eastern Europe -have left Sub-Saharan Africa as the only region in the world where substantial tariff and non-tariff barriers to trade are prevalent.

It is thus worth examining the experiences of the African countries, especially the lower income Sub- Saharan African countries in terms of export growth, in the light of the restrictive trade policies. Many countries have witnessed cyclical declines and marginalization in export performance over the past three decades.

Yeats (1997) points out that Africa's trade has grown at relatively low rates since the 1950s, with the result that today, the region's share in world trade stands at around 1%, down from more than 3 % in the mid-fifties. Indeed, African countries as a group have not fared well in trade, as seen from their exports, which have either stagnated or declined even in nominal terms. For example, between 1975 and 1984, African exports grew by an annual rate of 6.9 percent; this dropped to 2.9 percent during the period 1985-1989 (World Bank 1999). Exports increased slightly after 1994 but the expansion slowed again in 1998.

Africa has also not fared well with regard to its share of external trade compared to other developing regions in the world. In 1980, African countries accounted for close to 20 percent of all developing country exports. This fell to about 10 percent in 1990, before commencing a downward spiral for the next decade. In 1998, the share of African exports in total developing country exports was a dismal 6 percent, and falling. The outlook for a rapid expansion in exports for the African countries is not encouraging. It needs to be pointed out that the figures being discussed are gross numbers incorporating South Africa and Nigeria. The position is worsened when these countries are excluded to include only Sub-Saharan Africa.

The dismal performance in trade is closely reflected in developments in GDP growth. Africa's GDP growth averaged 0.8 % over the period 1965-1990. Growth in the fastest growing developing countries outside Africa averaged 5.8 %, while that for the rest of the developing world was 1.8% (Sachs and Warner 1999).

Furthermore, in the early 1960s, the GDP per capita in Sub-Saharan Africa was 60 percent of the average of the rest of the developing world. By 1990, this had fallen to 35 % and was much lower at the close of the millennium. Much of the decline occurred during the period 1980-94. The region recorded some modest gains after 1995 as reforms in a number of countries began to take hold.

The marginalization of African countries in trade and GDP growth happened in spite of the trade preferences received under the OECD's Generalized System of Preferences (GSP) schemes and through the Europeans Union's Lomé Convention, which extended low tariffs

for African exports to the OECD area. Even lower tariffs have been extended to the least developed countries in the region.

In summary then, it can be seen that in Africa protectionist measures were instituted and sustained over time, in an effort to expand local industry that may lead to increasing manufactured exports. This has ironically not been the case as the continent continued to be marginalized in trade and GDP growth.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter focuses on the conceptual framework of the model specified for the study. It consists of five sections. Section one provides the type and sources of data used for the study. The second section focuses on the specification of the model used for the study. Section three discusses how the variables used for the study were defined and measured as well as the expected impact of the determinants. The fourth section looks at the estimation technique with emphasis on the autoregressive distributed lag (ARDL) model, otherwise called the Bounds Test which was used to estimate the model specified for the study. Section five deals with how the data was analysed with emphasis on time series analysis.

3.1 Data Type and Sources

The study used annual time series data for the period 1986 – 2007 obtained from published sources. The major sources of data included World Bank's World Development Indicators, 2008 CD-ROM, IMF International Financial Statistics, 2006, African Development Indicators, WTO Trade Statistics. Other sources included annual reports of Bank of Ghana, State of the Ghanaian Economy (various issues) by Institute of Statistical, Social and Economic Research (ISSER). All estimations as well as the various econometric tests were carried out using the Microfit 4.1 econometric software.

3.2 Model Specification

In this section, a growth model based on the aggregate production model approach to growth modelling was specified for Ghana in order to estimate the impact of trade liberalization on GDP growth.

The starting point of an empirical analysis of growth model in any given economy is the growth model based on the aggregate production function given as:

$$Y_t = f(A, K, L) \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

where

Y_t is real GDP at time t, A is the total factor productivity (TFP) while K and L are the usual capital and labour inputs respectively.

Here, A captures the total factor productivity of growth in output not accounted for by increase in capital and labour. According to endogenous growth theory, A is endogenously determined by economic factors.

Therefore, in Ghana and for that matter in this study, it is assumed that

$$A = g(OPENNESS, POPGR, INFL, FDI) \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (2)$$

where

OPENNESS measures the extent of openness of the economy measured as a ratio of total trade (sum of exports and imports) to GDP. It is used as a measurement of liberalization; *POPGR* is the annual change in the population of the country; *INFL* is Inflation, a reflection of macroeconomic instability and *FDI* is foreign direct investment as a ratio to GDP.

Substituting equation (3) into equation (2) yields:

$$GDP_t = h(OPENNESS_t, POPGR_t, INFL_t, FDI_t, K_t, L_t) \quad \dots\dots\dots\dots\dots\dots\dots \quad (3)$$

However, data on the active employed labour force are not readily available (Ramirez, 2006), so many empirical studies (e.g. Li and Liu, 2005; Vamvakidis, 2002; Pattillo et al., 2002) use population as a proxy for labour. Hence, labour, L_t is dropped from the model.

Therefore, equation (4) becomes

$GDP_t = h(OPENNESS_t, POPGR_t, INFL_t, FDI_t, K_t,)$ ………………............. (4)

Equation (5) can be expressed as

$GDP_t = \beta_0 + \beta_1 OPENNESS_t + \beta_2 POPGR_t + \beta_3 INFL_t + \beta_4 FDI_t + \beta_5 K_t + \mu_t$ ....

(5)

where μ_t is the error term. All the other variables have already been defined.

From equation (6), the specific model for the real GDP growth for the Ghanaian economy in log-linear form is given as:

$\ln GDP_t = \beta_0 + \beta_1 \ln OPENNESS_T + \beta_2 \ln POPGR_t + \beta_3 \ln INFL_t + \beta_4 \ln FDI_t +$

$\beta_5 \ln K_t + \mu_t$ ....
(6)

where the β_i represent the elasticity coefficients

 Equation (6) above shows the long-run equilibrium relationship.

The choice of the log-linear model was because of the following reasons:

Firstly, to find the percentage change in the dependent variable resulting from percentage changes in the independent variable. Thus, the study sought to find the responsiveness of a change in GDP growth to changes in openness, population growth, inflation, FDI and capital (that is, elasticities of the the variables), hence the need to use the log-linear model.

Secondly, while the values for some of the variables such as inflation, GDP growth were small others such as gross domestic fixed capital formation (a proxy for capital), population, FDI were very large (in millions). There was therefore, the need to use the log form to bring the values for all the variables to the same unit or level.

Lastly, the use of log transformation is necessary because it reduces the scale of the variables from a tenfold to a twofold, thus reducing the possibility of heteroscedasticity in the model (Gujarati, 1995).

3.3 Definition and Measurement of Variables in the Model

- **GDP growth rate (GDPGR)**

Gross Domestic Product growth (GDPGR) is the annual percentage change in GDP. GDP is the total value of goods and services produced within the borders of an economy or a country during a given period of time measured in market prices. It is calculated without making deductions for depreciation.

- **Openness (OPENNESS)**

Openness (OPENNESS) is the sum of exports and imports of goods and services measured as a ratio to gross domestic product.

- **Population growth (POPGR)**

Population growth (POPGR) is the annual percentage change in population. Population here includes all residents in a country regardless of their legal status or citizenship except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of the country of origin.

- **Inflation (INFL)**

Inflation (INFL) as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a fixed basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Inflation rate is a reflection of macroeconomic instability.

- **Gross Fixed Capital Formation (K)**

Gross fixed capital formation (K) formerly gross domestic fixed investment includes plants, machinery and equipment. It also includes the construction of roads, railways, and others such as schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. The variable is used as a proxy for capital stock. Gross fixed capital formation as a proxy for capital has been used in several other studies such as Aryeetey and Fosu (2004), Mansouri (2005), Naguib (2008). It is worth emphasizing that the capital used in the study refers to real capital calculated using 2000 constant prices.

- **Foreign Direct Investment (FDI)**

Foreign direct investment (FDI) are 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 is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown on the balance of payments. It is expressed as a ratio to GDP. FDI also refers to real FDI calculated using 2000 constant prices.

The expected impacts of the determinants (i.e. independent variables) are as follow:

Trade openness used here as a measure of liberalization is often considered to be conducive for economic growth. In addition to the comparative advantage argument of the classical economists, trade openness enhances competition, promotes large markets, technology transfer and hence efficiency in production. It is thus expected that trade openness will have a positive relationship with GDP growth. Therefore, its coefficient β_1 is expected to be positive ($\beta_1 > 0$).

Population growth is often thought to be conducive for economic growth. A rise in population increases the market size and raises aggregate demand in the economy which in turn enhances investment and hence growth. Besides, population growth adds to the total labour force which affects labour supply and output. It is thus expected that population growth affects GDP growth positively. Therefore, $\beta_2 > 0$.

Inflation rate (annual CPI) is a reflection of macroeconomic instability. A high rate of inflation is generally harmful to growth because it raises the cost of borrowing and thus lowers the rate of capital investment. However, at low levels of inflation, the likelihood of such a trade-off between inflation and growth is minimal. Thus, inflation is expected to have a negative relationship with growth. Its coefficient, $\beta_3 < 0$.

Foreign Direct Investment is considered as an inflow of foreign capital to complement domestic investment. It is therefore expected that an increase in foreign direct investment leads to an increase in total investment and hence increase in total output and its rate of growth. Thus, its coefficient is expected to be positive. That is, $\beta_5 > 0$

Gross domestic capital formation as a percentage of GDP (a proxy for capital stock) is expected to positively affect real GDP growth. Thus, all things being equal, the higher the rate of investment the higher the real GDP growth, hence $\beta_6 > 0$

3.4 Estimation Technique

3.4.1 Autoregressive Distributed Lag (ARDL) Model

As already stated, equation (6) shows the long-run equilibrium relationship. In order to be able to analyse the long-run relationships as well as the dynamic interactions among the various variables of interest empirically, the autoregressive distributed lag cointegration procedure developed by Pesaran *et al* (2001) was used.

The choice of ARDL to estimate the model was informed by the following reasons:

❖ The ARDL cointegration procedure is relatively more efficient in small sample data sizes as is the case in this study. This study covers the period 1986–2007 inclusive. Thus, the total observations for the study is 22 which is relatively small.

❖ The ARDL enables the cointegration to be estimated by the ordinary least square (OLS) method once the lag of the model is identified. This is however, not the case of other multivariate cointegration techniques such as the Johansen Cointegration Test developed by Johansen (1990). This makes the ARDL procedure very simple.

❖ The ARDL procedure does not require the pretesting of the variables included in the model for unit roots compared with other techniques such as the Johansen approach. It is applicable regardless of whether the regressors in the model are purely I(0), purely I(1) or mutually cointegrated.

Following Pesaran *et al* (2001) as summarized in Choong *et al* (2005), the ARDL is applied by modelling the long-run equation (6) as a general vector autoregressive (VAR) model of order p in z_t.

$$z_t = \beta_0 + \alpha_t + \sum_{i=1}^{p} \phi_i z_{t-i} + \mu_t, \qquad t = 1, 2, 3, 4, \ldots, T \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (7)$$

where

β_0 represents (k + 1) – a vector of intercept (drift)

α represents (k + 1) – a vector of trend coefficients.

Pesaran *et al* (2001) further derived the following vector equilibrium correction model (VECM) corresponding to (7).

$$\Delta z_t = \beta_0 + \alpha_t + \pi z_{t-1} + \sum_{i=1}^{p} \tau_i \Delta z_{t-i} + \mu_t, \quad t = 1, 2, 3, 4, \dots T \quad \dots\dots\dots\dots\dots \quad (8)$$

where

$(k + 1) \times (k + 1)$ – matrices

$$\pi = I_{k+1} + \sum_{i=1}^{p} \psi_i \text{ and } \tau_i = -\sum_{j=i+1}^{p} \psi_j \quad i = 1, 2, \dots\dots, p - 1 \text{ contain the long-run multiplier}$$

and short-term dynamic coefficients of the VECM.

z_t is the vector of variables y_t and x_t respectively; Y_t is an I(1) dependent variable defined as *ln* Y_t (in this case *ln GDP*); x_t (OPENNESS$_t$, POPGR$_t$, INFL$_t$, FDI$_t$, K$_t$) is a vector matrix of 'forcing' I(0) and I(1) regressors.

Assuming further that here is unique long run relationship among the variable the conditional VECM becomes:

$$\Delta y_t = \beta_{y0} + \alpha_t + \theta_{yy} y_{t-1} + \theta_{xx} x_{t-1} + \sum_{i=1}^{p-1} \lambda_i \Delta y_{t-i} + \sum_{i=0}^{p-1} \theta \Delta x_{t-1} + \mu_{yt} \quad \dots\dots\dots\dots\dots \quad (9)$$

From the equation above, the conditional VECM can be specified as:

$$\Delta \ln GDP_t = \beta_0 + \theta_1 \ln GDP_{t-1} + \theta_2 \ln OPENNESS_{t-1} + \theta_3 \ln POPGR_{t-1} + \theta_4 \ln INFL_{t-1} +$$

$$\theta_5 \ln FDI_{t-1} + \theta_6 \ln K_{t-1} + \sum_{i=1}^{p} \beta_{1i} \Delta \ln GDP_{t-i} + \sum_{j=1}^{q} \beta_{2j} \Delta \ln OPENNESS_{t-j} + \sum_{k=1}^{q} \beta_{3k} \Delta \ln POPGR_{t-k}$$

$$\sum_{l=1}^{q} \beta_{4l} \Delta \ln INFL_{t-1} + \sum_{m=1}^{q} \beta_{5m} \Delta \ln FDI_{t-m} + \sum_{p=1}^{q} \beta_{6p} \Delta \ln K_{t-p} + \mu_t \quad \dots\dots\dots\dots\dots \quad (10)$$

where

θ_i are the long run multipliers and β_0 is the drift and μ_t are the error terms.

3.4.2 ARDL Bounds Testing Procedure

The ARDL Bounds testing procedure basically involves three steps. The first step in the ARDL bounds testing approach is to estimate equation (10) by ordinary least square (OLS) in order to test for the existence or otherwise of a long-run relationship among the variables. This is done by conducting an F-test for the joint significance of the coefficients of lagged levels of the variables.

The hypothesis would be:

$H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = 0$

$H_1: \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq 0$

The test which normalizes on GDP is denoted by

F_{GDP} (GDP | OPENNESS, POPGR, INFL, FDI, K)

Two asymptotic critical values bounds provide a test for cointegration when the independent variables are I(d) (where $0 \leq d \leq 1$): a lower value assuming the regressors are I(0) and an upper value assuming purely I(1) regressors.

Suppose the F-statistic is above the upper critical value, the null hypothesis of no long-run relationship is rejected regardless of the orders of integration for the time series. On the other hand, if the F-statistic falls below the lower critical values, the null hypothesis is

accepted, implying that there is no long-run relationship among the series. Lastly, if the F-statistic falls between the lower and the upper critical values, the result is inconclusive.

In the second stage of the ARDL bounds approach, once cointegration is established the conditional ARDL (p, q_1, q_2, q_3, q_4, q_5), the long-run model for GDP_t can be estimated as:

$$\ln GDP_t = \beta_0 + \sum_{i=1}^{p} \theta_1 \ln GDP_{t-1} + \sum_{I=0}^{q1} \theta_2 \ln OPENNESS_{T-1} + \sum_{i=0}^{q2} \theta_3 \ln POPGR_{t-1} + \sum_{i=0}^{q3} \theta_4 \ln INFL_{t-1}$$

$$+ \sum_{i=0}^{q4} \theta_5 \ln FDI_{t-1} + \sum_{i=0}^{q5} \theta_6 \ln K_{t-1} + \mu_t \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (11)$$

This involves selecting the orders of the ARDL (p, q_1, q_2, q_3, q_4, q_5) model in the six variables using Akaike Information Criterion (Akaike, 1973).

The third and the last step in the ARDL bound approach is to estimate an Error Correction Model (ECM) to capture the short-run dynamics of the system. The ECM generally provides the means of reconciling the short-run behaviour of an economic variable with its long-run behaviour.

The ECM is specified as follows:

$$\Delta \ln GDP_t = \gamma + \sum_{i=1}^{p} \beta_{1i} \Delta \ln GDP_{t-i} + \sum_{j=1}^{q} \beta_{2j} \Delta \ln OPENNESS_{t-j} + \sum_{k=1}^{q} \beta_{3k} \Delta \ln POPGR_{t-k} +$$

$$\sum_{l=1}^{q} \beta_{4l} \Delta \ln INFL_{t-1} + \sum_{m=1}^{q} \beta_{5m} \Delta \ln FDI_{t-m} + \sum_{p=1}^{q} \beta_{6p} \Delta \ln K_{t-p} + \rho ECM_{t-1} + \mu_t \quad \dots\dots\dots\dots \quad (12)$$

From equation (12), β_i represent the short-run dynamics coefficients of the model's convergence to equilibrium. ECM_{t-1} is the Error Correction Model. The coefficient of the Error Correction Model, ρ measures the speed of adjustment to obtain equilibrium in the event of shocks to the system.

3.5 Data Analysis

This section essentially looks at time series analysis. Under this section, unit root test would be conducted to ascertain the order of integration of the series used in the model in order to avoid the spurious regression problem.

3.5.1 Augmented Dickey-Fuller (ADF) Test

One major problem often associated with empirical analysis is non-stationarity of time series data. When variables being used for analysis are non-stationary, it usually leads to spurious regression results. In this case, the t-statistic, DW statistic as well as the R^2 values are not accurate.

For this reason, the Augmented Dickey-Fuller (ADF) test was used to test the stationary status of the variables used in the growth equation. The presence of unit root in the series indicates that the variable is non-stationary, hence the degree or order of integration is one or higher. The absence of unit root however, implies that the variables are stationary and the order of integration is zero.

3.5.3 Cointegration Test

The Autoregressive Distributed Lag (ARDL) Cointegration Test, otherwise called the Bounds Test developed by Pesaran *et al* (2001) was used to test for the cointegration relationships among the series in the model. Two or more series are said to be cointegrated if each of the series taken individually is non-stationary with I(1), while their linear combination are stationary with I(0). In a multiple non-stationary time series, it is possible that there is more than one linear relationship to form a cointegration. This is called the cointegration rank. The study therefore applies the ARDL cointegration technique developed by Pesaran *et al* (2001) to the system of the six variables in the growth equation to investigate the existence or otherwise of long-run equilibrium relationships among the variables.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF EMPIRICAL RESULTS

4.0 Introduction

This chapter presents a thorough analysis and discussion of the results of the study. The chapter is divided into four sections. Section one examines the time series properties of the data. It presents the unit root test and the bound test for cointegration. The second section presents and discusses the results of the estimated long run growth equation using the ARDL approach. The results of the Error Correction Model for the selected ARDL model were presented and analysed in the third section. The last section analyses the results of the estimated correlation coefficients between GDP growth and the explanatory variables and among the explanatory themselves.

4.1 Discussion of Time Series Properties

4.1.1 Results of the Unit Root Test

In order to examine the impact of trade liberalization (measured in this case by openness) on GDP growth in Ghana, the stationarity status of all the variables (that is, GDP growth, openness, capital, FDI, inflation and population growth) in the growth model specified for the study were determined. This was done to ensure that the variables were not integrated of order two (that is, I(2) stationary) so as to avoid spurious results.

Ouattara (2004) indicates that the computed F-statistics provided by Pesaran *et al* (2001) are not valid in the presence of I(2) variables. This is so because the bounds test is based on the assumption that the variables are integrated of order zero (that is, I(0)) or integrated of order one (that is, I(1)).

The stationarity test is based on the Augmented Dickey-Fuller (ADF) test. The results of the unit root test are presented in Table 4.1. The test regression included both an intercept (constant) and a linear trend as well as intercept with non linear trend for the log-levels and intercept with linear trend as well as an intercept with non linear trend for the first differences of the variables.

Table 4.1 Results of the Unit Root

		Log Level		**First Difference**	
Variable	Lags	Non Linear Trend	Linear Trend	Non Linear Trend	Linear Trend
GDPR	1	-1.0801	-1.4739	-4.0379**	-4.7946**
CAPITAL	1	0.20203	-1.0188	-2.3483	-3.3479**
FDI	1	-1.7487	-2.2959	-3.6361**	-3.7338**
INFLATION	1	-2.2526	-2.8260	-3.6112**	-3.5166**
POPULATION	1	-1.9041	-0.86677	0.016180	-34.8757**
OPENNESS	1	-1.6931	-2.6726	-2.9019	-3.1070**

** denotes the rejection of the null hypothesis of non-stationarity at 5% significance level.
Results were obtained from Microfit 4.1

The ADF test involves testing the null hypothesis of non-stationarity of the variables against the alternative hypothesis of stationarity.

As can be seen from the second and third columns of Table 4.1, when the regression is estimated at the log level (with and without linear trend), none of the variables becomes stationary. This is because the values of the test statistic for all the variables with and without linear trend are less than the critical ADF value of –3.00 in absolute terms at 5 percent level of significance. Thus, the ADF unit root test results in the table indicate that the null hypothesis of non-stationarity (with and with no trend) cannot be rejected for all the variables at the log levels. This means that the variables are integrated of order one or higher since none of them is stationary at the log level.

All the variables become stationary after the first difference. This can be seen from columns four and five of Table 4.1. This is because the test statistic values for the variables are greater than the critical ADF value of −3.00 (with and with no linear trend) in absolute terms at 5 percent significance level. Therefore, the null hypothesis of non-stationarity can be rejected and the alternative hypothesis of stationarity accepted. Thus, the first difference of the variables is integrated of order zero, I(0) indicating that they are stationary.

The results of the ADF test go to suggest that all the variables are I(1) at the log levels but I(0) at the first difference, demonstrating the existence of unit root in the data for the variables used. The existence of unit root accentuates the presence of non-stationarity in the

variables and hence the use of the first difference of the variables for estimation and analysis.

4.1.2 Results of the Bounds Test for Cointegration

The initial step of the ARDL approach is to estimate the conditional VECM by ordinary least square in order to test for the presence of long run relationship among the variables. This is done by conducting an F-test for the joint significance of the coefficients of lagged levels of the variables. Thus, each of the variables in the model is taken as a dependent variable and a regression is run on the others. For instance, GDP is taken as the dependent variable and it is regressed on the other variables. After that another variable for instance Population is taken as the dependent variable and it is also regressed on the other variables. This action is repeated for all the variables in the model. When this is done the number of estimated regressions would be equal to the number of variables in the model.

Pesaran *et al* (1997) indicates that "this OLS regression in the first differences are of no direct interest" to the bounds cointegration test. It is however, the F-statistic values of all the regressions when each of the variables is normalized on the others which are of great importance.

This F-statistic tests the joint null hypothesis that the coefficients of the lagged levels are zero. In other words, there is no long-run relationship between them. The essence of the F-test is to determine the existence or otherwise of cointegration among the variables in the long run.

The results of the computed F-statistic when each variable is normalized (that is, considered as a dependent variable) in the ARDL–OLS regressions are presented in Table 4.2.

Table 4.2 Results of the Bounds Test for Cointegration

Dependent Variable	F-Statistic	Probability	Outcome
F_{GDP} (GDP $\vert$ OPEN, POP, INFL, FDI, K)	8.5352	0.003**	Cointegration
F_{POP} (POP $\vert$ GDP, OPEN, INFL, FDI, K)	33.2734	0.001**	Cointegration
F_{INFL} (INFL $\vert$ GDP, OPEN, POP, FDI, K)	2.1547	0.145	No Cointegration
F_{FDI} (FDI $\vert$ GDP, OPEN, POP, INFL, K)	1.3895	0.315	No Cointegration
F_{K} (K $\vert$ GDP, OPEN, POP, INFL, K)	1.1794	0.395	No Cointegration
F_{OPEN} (OPEN $\vert$ GDP, POP, INFL, FDI, K)	2.2216	0.136	No Cointegration

Lower Bound I(0) = 3.516 and Upper Bound I(1) = 4.781 at 1%.   ** denotes the rejection of the null hypothesis of no cointegration at 1%.   Results were obtained from Microfit 4.1

From Table 4.2, the computed F-statistic F_{GDP}(GDP $\vert$ OPENNESS, POPGR, INFL, FDI, K) = 8.5352 is higher than the upper bound critical value of 4.781 at 1 percent significant level. Also, F_{POGR}(POPGR $\vert$ GDP, OPENNESS, INFL, FDI, K) = 33.2734 is higher than

the upper bound critical value of 4.781 at 1 percent significance level. This implies that the null hypothesis of no cointegration is rejected meaning that there exists long-run cointegration relationships between the variables when the regressions are normalized on both GDP_t and $POPGR_t$ variables.

The computed F-statistics when the regressions are normalized on inflation, FDI, capital and openness are 2.1547, 1.3895, 1.1794 and 2.2216 respectively. Since these statistics are less than the lower bound critical value of 3.516 at both 5 percent and 1 percent levels of significance, the null hypothesis of no cointegration is accepted implying that there is no long run relationship among the variables when the regressions are normalized on inflation, FDI, capital and openness.

However, this study is based on growth theory, hence GDP_t is used as the dependent variable. Consequently, the results of the other regressions are neglected. Therefore, there is the existence of cointegration among the variables in the growth equation.

4.2 Results of the Estimated Long Run Growth Equation using the ARDL Approach

The results of the bounds test in section 4.1.2 clearly shows that long-run cointegration relationships exist among the variables, hence equation (12) is estimated using ARDL(1,1,0,1,1,0) selected based on Akaike Information Criterion (AIC). The results obtained by normalizing on real GDP growth (GDPR) in the long run are reported in Table 4.3. The coefficients indicate the long-run elasticities.

Table 4.3: Estimated Long Run Coefficients using the ARDL Approach

ARDL(1,1,0,1,1,0) selected based on Akaike Information Criterion

Dependent variable is LOGGDPR

Regressor	Coefficient	Standard Error	T-Ratio	P-Value
Ln*OPENNESS*	0.31577	0.17023	1.8550	0.091
Ln*K*	0.30420	0.10033	3.0320***	0.011
Ln*FDI*	-0.19525	0.029850	-6.5412***	0.001
Ln*INFL*	0.097414	0.065382	1.4899	0.164
Ln*POPGR*	3.2015	1.4482	2.2107**	0.049
CONSTANT	-59.2026	23.4210	-2.5278	0.028

*** (**) denote the rejection of the null hypotheses at 1% (5%) level of significance.
Results were obtained from Microfit 4.1

The coefficient of OPENNESS in the long run growth equation is positive and significant at 10 percent significance level. The sign of the OPENNESS variable supports the theoretical conclusion that trade openness (and hence liberalization of trade) contributes positively to GDP growth.

From the results in Table 4.3, the coefficient of openness is 0.32 which means that a 1 percent increase in trade openness leads to approximately 0.32% increase in GDP growth. This implies that trade openness (sum of export and imports to GDP, a measure of trade

liberalization) has a very high significant impact on GDP growth. This is consistent with theoretical expectation of the classical views on the role of trade in the macro economy. It is also consistent with other empirical studies such as Yanikkaya (2003), Wacziarg (2001) and Sachs and Warner (1995).

The results obtained goes to suggest that the trade liberalization policy adopted as part of the structural reforms in 1986 in Ghana has helped open up the economy and had raised economic growth. This emphasizes the fact that trade enhances competition and efficiency as well as transfer of technology and knowledge and hence growth. Prior to the period chosen for the study, Ghana's exports were mainly primary products whose prices were constantly fluctuating with a general downward trend. However, during the liberalization period (the period covered by this study), export diversification became one of the primary objectives. Non-traditional products such as pineapple and other citrus fruits as well as handicrafts became important export products. It can thus be said that this diversification policy has raised earnings or revenue from exports which has impacted positively on GDP growth.

The coefficient of capital stock which is 0.30420 is positive and significant at 1 percent significance level. A coefficient of 0.30420 for capital indicates that all things being equal, a 1 percent increase in capital stock raises GDP growth by approximately 0.30%. This means that gross fixed capital formation (a proxy for the capital stock) exerts a strong influence on GDP growth. This positive relationship between capital stock and GDP growth is consistent with the expectation of classical economic theory. It is also consistent

with the results obtained by Aryeetey and Fosu (2005). However, the coefficient of capital in Aryeetey and Fosu (2005) was not statistically different from zero.

The coefficient of foreign direct investment (FDI) expressed as a ratio to GDP was found to be -0.19525 but significant at 1 percent significance level. Thus, a percentage increase in FDI reduces GDP growth by approximately 0.195%. This is quite implausible since it is expected that FDI inflows enhances knowledge and technology transfer, thereby resulting in growth. It is also expected that additional inflows of FDI adds to output and not to reduce it. However, this results is consistent with the results obtained by Frimpong and Oteng (2006).

An important source of the negative role of FDI in Ghana with regards to GDP growth may be due to the overconcentration of foreign direct investments in the mining and construction industries.

Mining accounts for the lion's share of total FDI in Ghana. Investors are attracted by Ghana's wealth of gold, bauxite, diamond, manganese and oil exploration. Around 70% of all FDI is concentrated in this sector (UNCTAD, 2003). Notwithstanding, foreign firms play important role in banking and in the construction sector, buildings, roads, public work as well as in the manufacturing sector.

Between 1994 and 2002, the agriculture sector accounted for 11.52% of total FDI while manufacturing's share amounted to 19.52%. During the same period, tourism, general

trade, export trade and building and construction all accounted for 1.93%, 5.72%. 0.88% and 7.11% respectively of the total share of FDI (GIPC, 2003).

Thus, most of the FDI inflows into the country go to the mining and construction sectors of the country. This however, does not generate direct growth impact on the economy as a whole. Therefore, for FDI to achieve positive impact on GDP growth in Ghana, it should be diverted to the agricultural and industrial sectors of the economy where there is large concentration of the labour force.

Inflation has a coefficient of 0.0974. It also has a positive but insignificant impact on GDP growth. It is however, not statistically different from zero at both 5% and 10% levels of significance. The results in Table 4.3 indicate that when inflation goes up by 1 percent, GDP growth also goes up by approximately 0.097%.

Obviously, it is expected that a rise in inflation raises the cost of borrowing which lowers the rate of capital investment and thus reduces output growth. However, the results obtained here indicate the reverse. But other studies have found results similar to what has been obtained here.

Khan and Senhadji (2001) have argued that inflation per se is not harmful to growth. Their study suggested that there is a threshold beyond which inflation is harmful to growth (i.e. inflation negatively affects economic growth). Additionally, it can be said that when inflation is creeping it is not harmful to growth.

The positive relationship between inflation and GDP growth obtained in this study is consistent with the structuralist believe that inflation is essential for economic growth. It is also consistent with the findings of Girijasankar and Chowdhury (2001) who also found a similar long run positive relationship between inflation and GDP growth in four Asian countries namely, Bangladesh, India, Pakistan and Sri Lanka.

One probable reason for the positive relationship between GDP growth and inflation could be due to the sample size of the data for the study. The study covers the period 1986 – 2007 which could be described as relatively small. Thus, an extension of the study period backwards to increase the sample size probably could have helped achieve the expected theoretical sign which is negative.

Another potential reason for the positive relationship between inflation and GDP growth may be due to data problems. Inflation is a variable that affects the entire economy. Its computation therefore involves taking into account the prices of all the activities that go on in all the individual markets namely, the product or goods, labour and financial and capital markets in the economy. Most activities go on in the subsistence and informal sectors (the dominant sectors of the economy) which are usually more difficult if not impossible to capture in the consumer price index (CPI) which is used as the measure of inflation in this study.

The coefficient of population which is 3.2015 carries a positive sign and it is also significant at 5 percent level of significance. The implication is that a percentage increase

in population raises GDP growth by approximately 3.20%. Thus, the results suggest that in the long-run, population enhances growth. This is consistent with theoretical expectation since a rise in population increases the market size and raises aggregate demand in the economy. Additionally, population growth adds to the total labour force. This increases the supply of labour which in turn enhances investment and hence output growth. The results obtained here is consistent with Harrison (1996) and Siddique and Iqbal (2005) who also found positive relationship between population growth and GDP growth.

The constant represents the value of the intercept of GDP growth. Thus, it is the estimated value of GDP growth when all the independent variables are zero. In the estimated long run growth equation, the constant is -59.2026 which represents the estimated value of GDP growth when all the parameters or coefficients of the independent variables are zero.

4.3 Results of the Error Correction Model for the selected ARDL Model

Generally, the Error Correction Model (ECM) provides the means of reconciling the short run behaviour of an economic variable with its long-run behaviour. The existence of cointegration relationships among the variables implies the estimation of Error Correction Model to determine the dynamic behaviour of the growth equation. The Error Correction Model captures the short run dynamics of the system and its coefficient measures the speed of adjustment to obtain equilibrium in the event of shocks to the system. Table 4.4 reports the results of the short-run dynamic growth equation.

Table 4.4 Error Correction Model for the Selected ARDL Model

ARDL(1,1,0,1,1,0) selected based on Akaike Information Criterion
Dependent variable is dLnGDPR

Regressor	Coefficient	Standard Error	T-Ratio	P-Value
dLn*OPENNESS*	-0.30408	0.33351	-0.91176	0.377
dLn*LOGK*	0.39323	0.12316	3.1929**	0.007
dLn*FDI*	-0.037806	0.044731	-0.84518	0.412
dLn*INFL*	0.013034	0.061935	0.21045	0.836
dLn*POPGR*	4.1384	1.9840	2.0860***	0.056
CONSTANT	-76.5291	32.2671	-2.3717***	0.033
ecm(-1)	-1.2927	0.16015	-8.0715**	0.001

ecm = LOGGDP -0.31577*LOGOPENNESS -0.30420*LOGK + 0.19525*LOGFDI -
0.097414*LOGINF -3.2015*LOGPOP + 59.2026*C

R-Squared = 0.89121	R-Bar-Squared = 0.80219
S.E. of Regression = 0.094467	F-stat. F(6, 14) = 15.0181[.001]
Mean of Dependent Variable = 0.076091	S.D. of Dependent Variable = 0.21240
Residual Sum of Squares = 0.098164	Equation Log-likelihood = 26.5415
Akaike Info. Criterion = 16.5415	Schwarz Bayesian Criterion = 11.3189
DW-statistic = 2.2592	

** (***) denote the rejection of the null hypotheses at 1% (5%) level of significance.
Results were obtained from Microfit 4.1

The results from the table indicate that the model passed the diagnostic tests. A DW-statistic of 2.2592 indicates that there is no strong serial correlation in the residuals. The overall regression is significant at both 5% and 1% as can be seen from the R-squared and the F-statistic. R-squared value of 0.8912 indicates that about 89% of the change in the dependent variable (dLnGDP) is explained by changes in the independent variables. Also, an F-statistic value of 15.018 suggests the joint significance of the determinants in the ECM.

From Table 4.4, the coefficients of the variables provide interesting results since they maintain their signs as in the long run equation except the coefficient of the OPENNESS variable whose sign change from positive to negative. The coefficients indicate the short-run elasticities.

The coefficient of the OPENNESS variable this time is negative. It is also not statistically different from zero at both 5% and 10% levels of significance. This shows that in the short run, openness of trade (trade liberalization) could be detrimental to growth in Ghana. The negative contribution of trade to growth in the short run may be due to the unfavourable terms of trade. The exports of Ghana are mainly raw primary products which experience fluctuating prices while the prices of her imports which are mainly consumables are rising, thus creating unfavourable terms of trade.

In addition, the unfair competition on some of the sectors of the economy such as the textiles, poultry, rice, among others that results from trade liberalization could explain the negative impact of trade openness on GDP growth. In the short run, some of the domestic

sectors of the economy are not able to compete more favourably with their more efficient counterparts of the advanced countries. This is usually because most of the domestic industries are infant industries which produce at a relatively higher average cost. This situation reduces the productivity in these sectors which subsequently affects growth negatively.

Conversely, in the long run the economy could be diversified resulting in the export of processed and semi-processed products with relatively high and stable prices. Also, in the long run the imports of the country may contain investment and intermediate goods which have growth potentials.

This behaviour of the OPENNESS variable is consistent with both classical and protectionist arguments. The classical argument that openness of trade resulting from comparative advantage leads to growth is valid in the long run while the protectionist argument that trade openness has a detrimental effect on growth is valid in the short run, as far as the Ghanaian economy is concerned.

The coefficient of the capital stock in the short run is still positive and statistically different from zero at 1% significance level which is consistent with the result of the long-run equation discussed in the previous section. This reaffirms the significant role of capital in the growth process of Ghana.

The coefficient of foreign direct investment though maintains its negative impact on growth as in the long run situation, it is not statistically different from zero neither at 5%

nor 10% levels of significance. This is an indication that in the short-run, the impact of an increase in foreign direct investment is not growth enhancing. This reemphasizes the concentration of foreign direct investment in the mining and construction sectors of the economy of Ghana.

The coefficient of inflation (0.0130) shows that inflation maintains positive impact on GDP growth. It is not statistically different from zero at both 5% and 10% levels of significance. This implies that some level of inflation (which is a measure of macroeconomic instability) is required for growth both in the long run and in the short run since a rise in inflation raises GDP growth. This is usually the case when inflation is creeping.

The sign of the coefficient of the population variable is still positive (4.1384) which highlights its positive impact on GDP growth. It is also significant at 5% level of significance. This again reemphasizes the important role that population growth plays in promoting economic growth in the economy. Population increase raises both aggregate demand and supply of labour which subsequently results in output growth.

The estimated coefficient of the error correction model (ecm) is highly significant at 1% level of significance and also has the appropriate negative sign. This is an indication of joint significance of the long-run coefficients. From the results in Table 4.4, the estimated coefficient of the error correction model is –1.2927. This reflects a very high speed of adjustment to equilibrium after a shock. This is because approximately more than 129% of

disequilibria from the previous year's shock converges back to the long-run equilibrium in the current year.

4.4 Results of the Estimated Correlation Matrix

In order to determine the relationship between the dependent variable (GDPR) and the independent variables (openness, capital, foreign direct investment, inflation and population growth) and also between the independent variables themselves, the correlation matrix for all the variables was estimated.

Table 4.5 illustrates the results of the estimated correlation matrix of the variables.

Table 4.5 Estimated Correlation Matrix of the Variables

	GDPR	K	FDI	INFL	POP	OPENNESS
GDPR	1.0000	0.44086	-0.0065271	-0.085627	-0.13823	0.079485
K	0.44086	1.0000	0.29021	0.23098	-0.15244	0.34571
FDI	-0.0065271	0.29021	1.0000	0.081529	0.12311	0.19020
INFL	-0.085627	0.23098	0.081529	1.0000	0.13956	-0.38488

POP	-0.13823	-0.15244	0.12311	0.13956	1.0000	-0.41683
OPENNESS	0.079485	0.34571	0.19020	-0.38488	-0.41683	1.0000

Results were obtained from Microfit 4.1

The results indicate that there is a positive correlation between GDP growth (GDPR) and trade openness (OPENNESS). The reported correlation coefficient between GDP growth and OPENNESS is 0.079485. The positive relationship between GDP growth and OPENNESS is consistent with the findings obtained from the long run growth equation. However, it contradicts the short run results.

The correlation between GDP growth and foreign direct investment (FDI) is also negative. An estimated correlation coefficient of –0.0065271 between GDP and FDI provides the evidence that FDI in Ghana does not benefit the entire economy, hence does not add to growth. This also reaffirms the results obtained from both the long-run and short-run growth equations discussed in the previous sections.

Interestingly, GDP growth and inflation (INFL) are negatively correlated with a correlation coefficient of -0.085627, a result that highly contradicts the findings of the long-run and short-run growth equations. But it supports the theoretical argument that inflation and GDP growth are negatively correlated.

Furthermore, there also exits a negative correlation between GDP growth and population growth (POP). A correlation coefficient of –0.13823 also goes contrary to the findings obtained from the long run and short run growth equations.

Capital stock (K) and foreign direct investment (FDI) are also positively correlated with a correlation coefficient of 0.2902. This results is consistent with theoretical expectations.

There is also positive correlation between trade openness and foreign direct investment. They have a correlation coefficient of 0.1902.This results is expected to be the situation in developing countries.

Finally, a positive correlation with a coefficient of 0.1395 between population growth and inflation to some extent meet theoretical expectation.

In all these analyses, a great deal of caution must be exercised in comparing the correlation coefficients with the regression coefficients since the former does not express causal relationship between the variables under consideration.

The regression for the underlying ARDL model passed the diagnostic tests (See Appendix I on page 93). From the results, the first order serial correlation problem is eliminated as can be seen from the DW statistic of 2.259 and LM statistic of 0.9146 which is an indication of the acceptance of the null hypothesis of no serial correlation in the residuals.

The model also has a high R-squared (86.17%) implying a high predictive power of the determinants. The high R-squared and high F-statistic show a tight fit for the model.

The Ramsey's RESET test also revealed that the model was correctly specified while the normality test indicates that the residuals are normally distributed. Heteroscedasticity is also not a serious problem.

The parameters or coefficients of the model are also stable over the sample period according to the Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMQ) test for stability (See Figures 1 and 2 of Appendix II on page 95).

CHAPTER FIVE

FINDINGS, RECOMMENDATIONS AND CONCLUSION

5.0 Introduction

This chapter concludes the entire study. It summarizes the major findings obtained from the study as well as their policy implications. It further provides recommendations based on the findings of the study.

5.1 Summary of Findings

After applying both economic and econometric tools to thoroughly analyse the impact of the trade liberalization policy on GDP growth in Ghana, the following summarized findings were obtained from the study.

❖ It was found in the study that there exists a positive and significant relationship between GDP growth and trade openness in the long run. The results of the long run growth equation revealed that a 1 percent increase in trade openness leads to approximately 0.32% increase in GDP growth. The opposite results was however obtained in the short run where a percentage increase in trade openness results in approximately 0.30% fall in GDP growth though the negative results was not significant at both 5% and 10% levels of significance. Thus, the study found that the classical argument that trade openness resulting from comparative advantage leads to economic growth is valid in the long run while the protectionist argument that trade openness harms economic growth is valid in the short run in the Ghanaian context.

❖ The study also found a positive and significant relationship between capital stock and GDP growth both in the long run and short run. This reemphasizes the significant role that capital plays in the growth process of Ghana.

❖ The study also revealed that foreign direct investment (FDI) is not growth enhancing in Ghana. The negative relationship between GDP growth and FDI in both the long run and short run is a clear indication that foreign direct investments in Ghana do not benefit the wider sector of the economy. It is expected that inflow of FDI benefits the agriculture sector (which is the largest sector of the economy) as well as the manufacturing sector. However, it only benefits the mining and construction sectors. For this reason, the impact of foreign direct investment usually

does not trickle down to a larger sector of the economy and hence majority of the people do not benefit from inflow of foreign direct investment.

❖ An interesting finding of the study was that inflation was found to promote growth both in the short run and long run situations. However, its positive relationship with GDP growth was not significant in both cases at both 5% and 10% levels of significance. However, the correlation coefficient which provided the opposite results showed theoretically correct sign (i.e. negative).

❖ Population growth was also found to have positive and significant effect on GDP growth in both the long run and short run situations at 5% significance level.

❖ The study found a positive relationship between foreign direct investment and capital stock which was proxied by gross domestic capital formation. This was consistent with theoretical expectation since a rise in foreign direct investment is expected to augment domestic investment, thereby increasing the capital stock of the economy.

5.2 Policy implications and Recommendations

The findings outlined in section 5.1 have some policy implications. The results discussed in the previous chapter have actually thrown light on some policy-related variables that have had significant impact on GDP growth for the period under consideration. In view of this,

recommendations have also been made to help achieve a higher and sustained GDP growth in Ghana.

❖ The openness variable has a positive impact on GDP growth in the long run while its short run impact is negative. The implication is that excessive liberalization with the aim of promoting trade will in the short run reduce the rate of growth of GDP. The alternation of the sign of the openness variable in the short run and long run growth equations suggests a possible trade off between trade liberalization and trade restriction. In the long run, trade liberalization will be growth enhancing while in the short run it is detrimental to growth.

Export promotion should be highly intensified as part of the trade liberalization policy. This can take the form of regularly organizing trade fairs at least every quarter in the year. In addition, there should also be diversification of our exports. This can be done by adding value to our exports so that they attract competitive prices on the world market. Domestic consumers should also be encouraged to patronize domestic goods and services. This can be achieved through the organization of rural trade fairs and exhibitions at the district level to showcase made in Ghana goods. This will help reduce domestic expenditure on imported goods so as to ensure favourable balance of trade, thereby, resulting in growth.

Undoubtedly, some sectors or firms in the economy would be adversely affected by the liberalization policy. The affected sectors or firms could be compensated through the provision of tax concessions by the government. This can take the form of tax holiday or tax relieve for those other sectors that lose due to the policy.

❖ The study also showed a positive relationship between capital stock and GDP growth. This implies that GDP growth could be achieved in Ghana by increasing savings so as to raise adequate capital. Despite the significant role of capital in the growth process of Ghana, there is low capital formation which has resulted in shortage of capital. The problem of shortage of capital is mainly due to low savings. Thus, increasing savings could make adequate capital available to investors.

One way to increase savings in Ghana is to institute deposit insurance schemes to safeguard depositors. This will encourage savers to put more money at the bank. This would help mobilize adequate capital which could be channeled to investors to produce more output to increase the gross domestic product of Ghana.

Also, liberalization of the financial market could be done to increase savings. Liberalization of the financial sector will obviously lead to a rise in the number of financial institutions in the country. This will increase the competition for savings which will raise interest rate on savings, thereby encouraging savers to save more. Consequently, more capital will be made available for investors to invest. This recommendation is based on the fact that households and firms (who are the main savers in the economy) consider the interest rate or what they will gain from saving their money at the bank before they make the decision to save. Thus, at higher interest rates savers will be induced to save more, resulting in more capital being made available to investors than at lower interest rates.

❖ Another interesting result of the study which must be considered in designing policies aimed at enhancing GDP growth in Ghana is the negative relationship between FDI and real GDP growth. This is a clear manifestation of the overconcentration of FDIs in a few sectors of the economy mainly mining and construction sectors.

Encouraging and directing foreign direct investors to invest in the industrial and agricultural sectors could be growth enhancing. Conducive and investor friendly environment must be created in the manufacturing and agricultural sectors of the economy so as to attract direct foreign investors into those sectors. These may include tax holidays and tax relieves to investors who wish to go to these sectors as well as improvement in the infrastructural base of the country such as roads, communications, among others particularly in the rural areas. Review of the land tenure system to avoid cumbersome process of acquiring land can also help attract investors into the agriculture sector. When this is done, it would complement domestic investment in those sectors so as to accelerate GDP growth and its impact will consequently be trickled down to the vast majority of people in the economy. The emphasis is placed on the manufacturing and agricultural sectors because of their contributions in the economy in terms of employment creation, income generation, foreign exchange generation, revenue generation, GDP growth, among others.

❖ The study found a positive but insignificant relationship between inflation and GDP growth both in the short run and long run. The implication is that some level of inflation is required for GDP growth in Ghana but too fast a growth rate may

accelerate the inflation rate and take the economy downhill. The challenge for the government and policy makers should therefore be to find a growth rate that is consistent with a stable inflation rate rather than beat down inflation first to take the economy to a path of faster economic growth.

❖ Population growth was also found to have a positive relationship with GDP growth. This is an indication that the larger the population size the larger the potential labour force and the larger the market size and the resulting increase in aggregate demand. Policies focused on population growth should therefore be tailored towards achieving a sizeable population growth. Population growth per se is not a problem but its relation to the available resources of the economy. Couples should therefore be encouraged to have a sizeable family. This way, the adverse effects of population growth on the economy could be curtailed.

Additionally, the capacity of the existing population could be enhanced. This could be done through the provision of adequate educational facilities, health facilities and other social services.
Adequate educational facilities could enhance the skills and expertise of the population which in turn could increase the output per capita of the population resulting in GDP growth.

Apart from increasing labour productivity, adequate health infrastructure could reduce morbidity and mortality rates and increase life expectancy. All these could culminate into output growth and consequently GDP growth.

5.3 Conclusion

In 1986, Ghana adopted the trade liberalization policy as part of the IMF and World Bank supported Structural Adjustment Programme. Theoretically, it is expected that when an economy liberalizes its trade, it impacts positively on GDP growth.

The objective of this study was therefore to find out the impact of the trade liberalization policy on the GDP growth of Ghana. In the study, openness was used as a measure of liberalization.

The study used a set of annual data from 1986 – 2007 as well as time series analysis and also employed the autoregressive distributed lag (ARDL) approach for estimation to achieve the above objective.

The empirical results of the study suggest that trade liberalization enhances GDP growth in Ghana in the long run but hampers growth in the short run.

In both the long run and short run error correction model, the coefficients of capital, population and inflation were found to be growth enhancing in Ghana while foreign direct investment (FDI) was not. The influence of OPENNESS was not consistent.

The study recommended policies to encourage foreign direct investors to invest in agriculture and manufacturing sectors of the economy so that the impact of FDI will be felt by majority of the people. Export diversification and other measures to add value to Ghanaian exports were also recommended so that the economy will benefit from trade openness.

5.4 Practical Limitations of the Study

Various limitations were encountered in the course of the study. The study was hampered by financial and material constraints as well as time. There was virtually no funding for the study apart from the government grant of GH¢60.00 which is not only woefully inadequate but also paid at the time the study has been completed. All the funding for the study came from the researcher's already weak financial background. Data availability as well as time imposed serious limitations on the study.

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APPENDIX I

RESULTS OF THE ARDL ESTIMATES

Autoregressive Distributed Lag Estimates

ARDL(1,1,0,1,1,0) selected based on Akaike Information Criterion

Dependent variable is LOGGDP

21 observations used for estimation from 1987 to 2007

Regressor	Coefficient	Standard Error	T-Ratio	Probability
LnGDP (-1)	-0.29266	0.16015	-1.8274	0.095
LnOPEN	-0.30408	0.33351	-0.91176	0.381
LnOPEN (-1)	0.71227	0.28414	2.5068	0.029
LnK	0.39323	0.12316	3.1929	0.009
LnFDI	-0.037806	0.044731	-0.84518	0.416
LnFDI (-1)	-0.21459	0.047541	-4.5138	0.001

LnINF	0.013034	0.061935	0.21045	0.837
LnINF(-1)	0.11289	0.059675	1.8917	0.085
LnPOP	4.1384	1.9840	2.0860	0.061
C	-76.5291	32.2671	-2.3717	0.037

R-Squared	0.86169	R-Bar-Squared	0.74853
S.E. of Regression	0.94467	F-stat. F(9, 11)	7.6149[.001]
Mean of Dependent Variable	1.5396	S.D. of Dependent Variable	0.18838
Residual Sum of Squares	0.098164	Equation Log-likelihood	26.5415
Akaike Info. Criterion	16.5415	Schwarz Bayesian Criterion	11.3189
D-W-statistic	2.2592	Durbin's h-statistic	-

0.87438[.382]

Diagnostic Tests

Test Statistics	LM Version	F Version
A: Serial Correlation [0.515]	CHSQ (1) = 0.91460[0.339]	F(1, 10) = 0.45536
B: Functional Form 0.0090344[0.926]	CHSQ (1) = 0.18955[0.890]	F(1, 10) =
C: Normality	CHSQ (2) = 0.67660[0.713]	Not applicable
D: Heteroscedasticity [0.065]	CHSQ (1) = 3.5316[0.060]	F(1, 19) = 3.8412

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

APPENDIX II

CUSUM AND CUSUMQ FOR COEFFICIENTS STABILITY

Figure 1

Plot of Cumulative Sum of Recursive Residuals

The straight lines represent critical bounds at 5% significance level
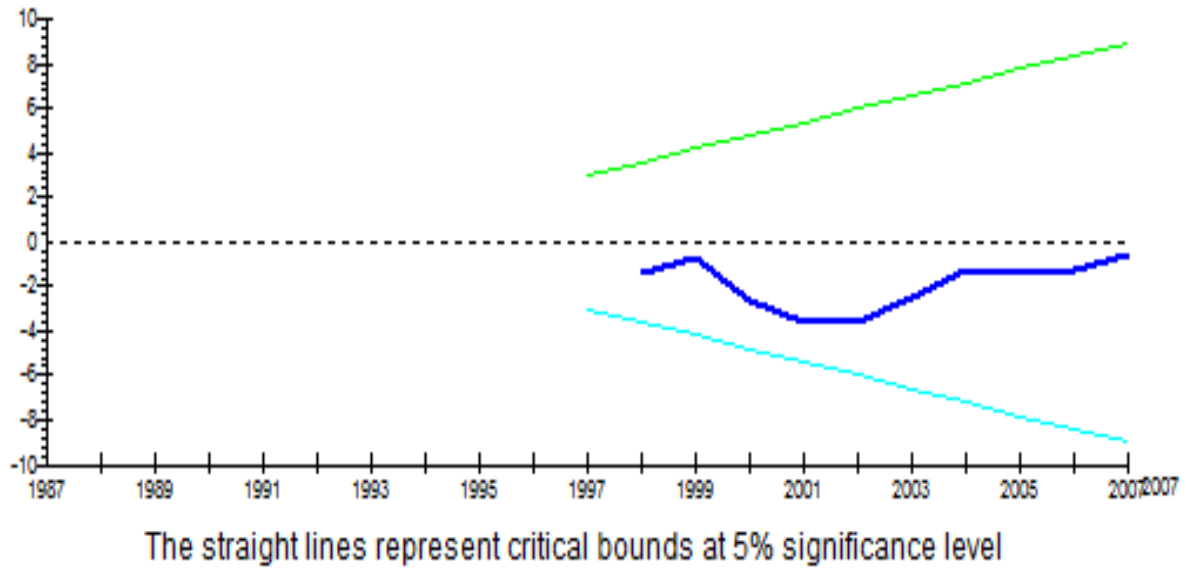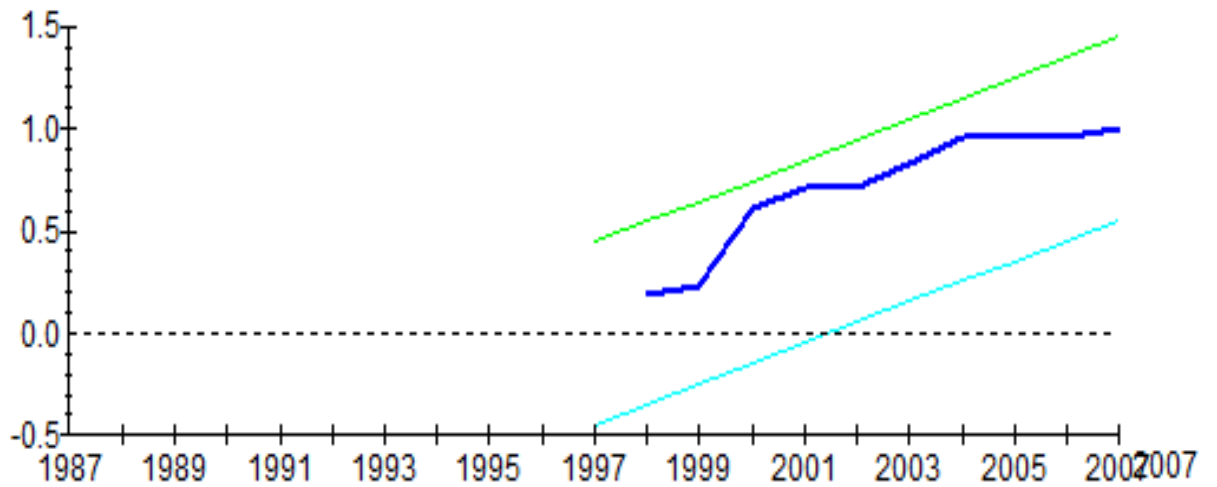
Figure 2

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level
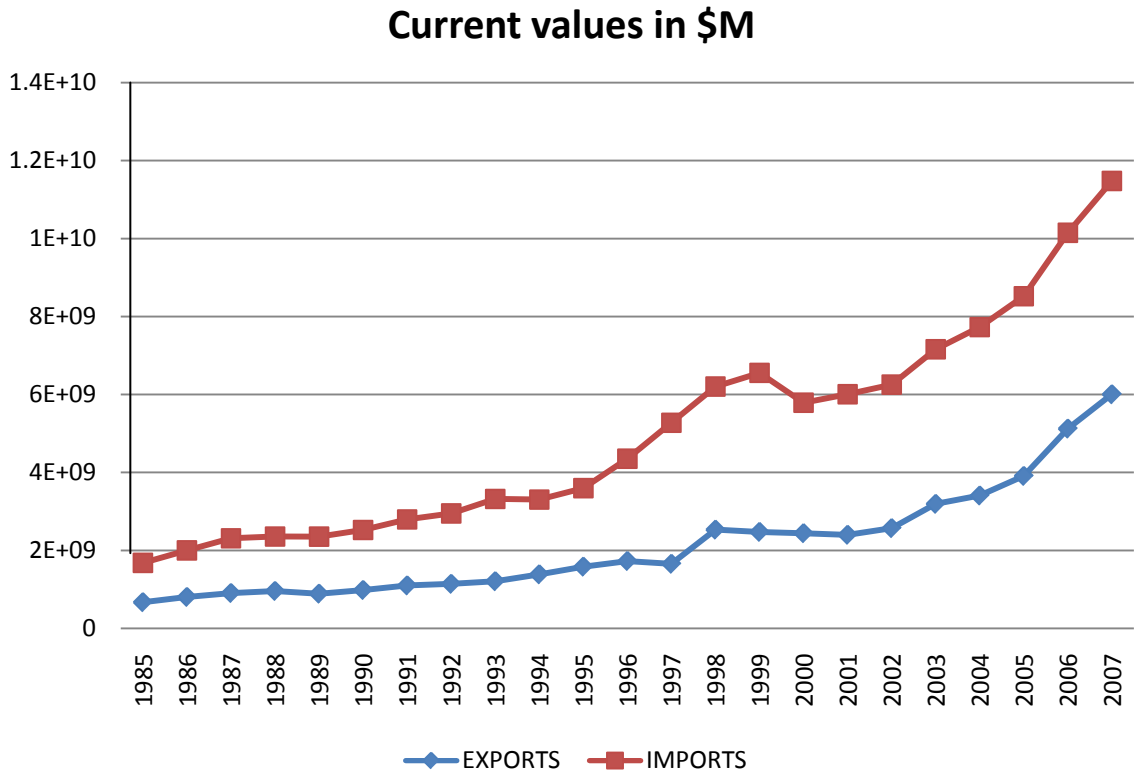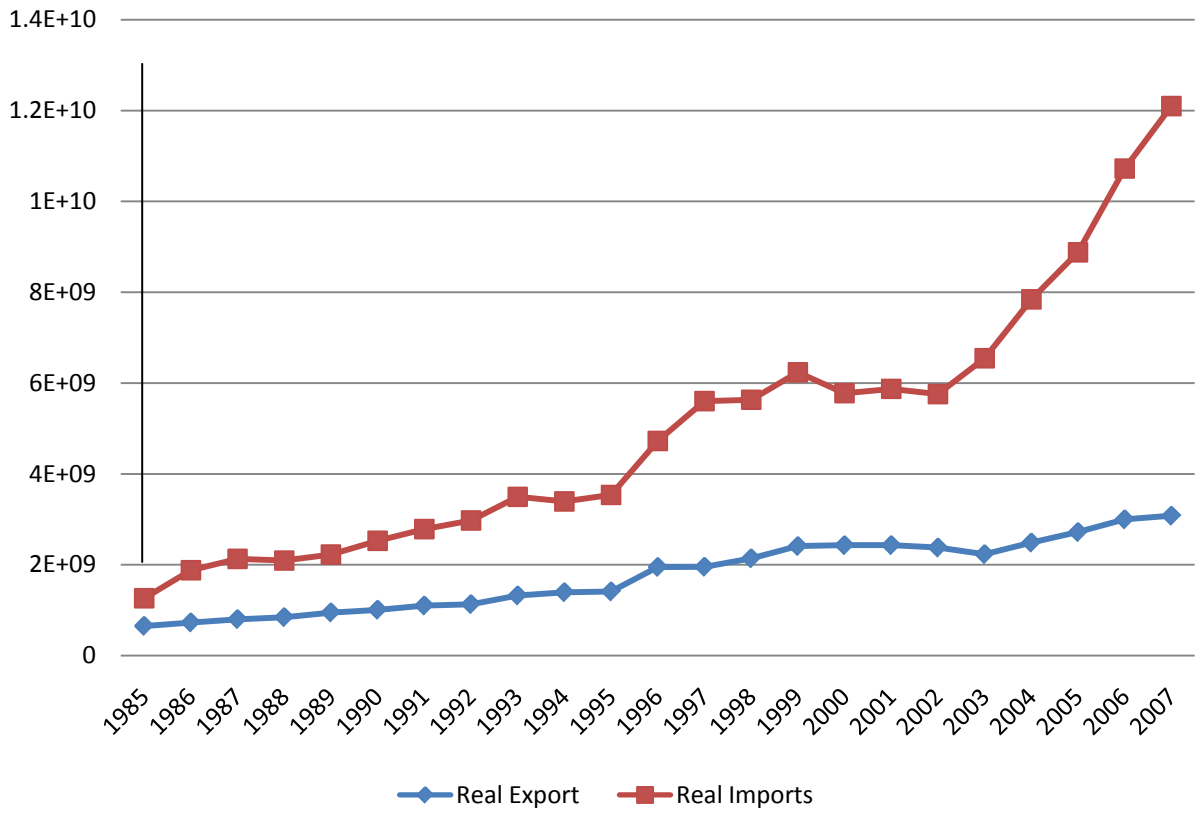
APPENDIX III

TREND IN EXPORTS AND IMPORTS

Figure 3

Current values in $M

Figure 4

Real values in $M

APPENDIX IV

DATA USED FOR THE STUDY

Year	RGDP	INFL	CAPITAL	OPEN	POPGR	FDI
1986	5.2	24.6	5.32E+08	36.7	3.1	0.08
1987	4.8	39.8	5.26E+08	45.8	2.9	0.09
1988	5.6	31.4	5.84E+08	42.2	2.8	0.01
1989	5.1	25.2	6.91E+08	41.1	2.8	0.29
1990	3.3	37.3	8.47E+08	42.7	2.8	0.25
1991	5.3	18.0	1.04E+09	42.5	2.8	0.30
1992	3.9	10.1	8.17E+08	46.0	2.8	0.35
1993	4.8	25.0	1.42E+09	56.7	2.7	2.10
1994	3.3	24.9	1.23E+09	62.0	2.7	4.28
1995	4.1	59.5	1.36E+09	57.4	2.5	1.65
1996	4.6	46.6	1.41E+09	72.2	2.4	1.73
1997	4.2	27.9	1.64E+09	85.4	2.3	1.19
1998	4.7	14.6	1.67E+09	80.6	2.2	2.24
1999	4.4	12.4	1.58E+09	82.1	2.2	3.16
2000	3.7	25.2	1.15E+09	116.7	2.2	3.33
2001	4	32.9	1.44E+09	109.9	2.2	1.68
2002	4.5	14.8	1.16E+09	96.9	2.2	0.96
2003	5.2	26.7	1.75E+09	92.5	2.2	1.79
2004	5.6	12.6	2.52E+09	99.7	2.1	1.57
2005	5.9	15.1	3.11E+09	97.7	2.0	1.35
2006	6.4	10.9	4.41E+09	97.8	2.1	3.12
2007	6.3	12.5	4.95E+09	99.2	2.0	3.94