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FOREIGN DIRECT INVESTMENT AND ECONOMIC

GROWTH: EVIDENCE FROM LIBERIA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate Signature:…………..……. Date:…..…………..….

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Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

The study investigated the relationship between foreign direct investment and economic growth in Liberia. The Autoregressive Distributed Lag approach to cointegration was used with annual data from IMF Statistics 2009 CD ROM, WDI. Capital was disaggregated into foreign direct investment and domestic private investment for a more comparative analysis of their impacts on economic growth. Economic growth was measured by real GDP, Foreign Direct investment (FDI) was measured by Net FDI inflow as share of Real GDP. The study used gross domestic investment as a share of Real GDP as a proxy for gross fixed capital formation in real terms, and labor force was measured as a proportion of total population ages 15-65. Inflation, exports and openness were used as control variables for policy purposes.

Results from the study suggest that FDI enhances economic growth in Liberia and that domestic investment highly explains economic growth in Liberia. The growth in the labour force had a positive impact on economic growth over the study period. Granger causality test shows that domestic investment causes economic growth. The results also revealed that inflation, exports and openness are critical in enhancing sustained economic growth and development in Liberia.

Therefore, it is recommended that the Government of Liberia ensure a low inflation level to maintain and sustain an increase in economic growth. Incentives should be given to domestic firms to export in the form of reduced export tariffs and the government should ensure that openness to trade be more accommodating in order to acquire the necessary technologies and skills for the growth of the economy.

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DEDICATION

To my late parents: Raouf M. Adnan and Catherine T. Howard, my
wife Fatumata W. Adnan and our children; Joshua, Raphael, and Rajie Jr.

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LIST OF ACRONYMS

ADB	African Development Bank
AIC	Akaike Information Criterion
ADF	Augmented Dickey-Fuller
ARDL	Auto Regressive Distributed Lag
BIC	Bayesian Information Criterion
BOP	Balance of Payment
BMC	Bong Mining Company
CBL	Central Bank of Liberia
CUSUM	Cumulative Sum of Recursive Residuals
CUSUMSQ	Cumulative Sum of Squares of Recursive Residuals
DF	Dickey-Fuller
DI	Domestic Investment
DPI	Domestic Private Investment
ECOSOC	Economic and Social Council
ECM	Error Correction Model
ECT	Error Correction Term
EPZs	Export Processing Zones
FDI	Foreign Direct Investment
FDA	Forestry Development Authority
GDP	Gross Domestic Product
IFS	International Financial Statistics
IMF	International Monetary Fund
INFL	Inflation
LAMCO	Liberia American Swedish Minerals Company

LM	Lagrange Multiplier
LDCs	Less Developed Countries
LDPI	Log of Domestic Private Investment
LFDI	Log of Foreign Direct Investment
LIGIS	Liberia Geo and Information Service
LRGDP	Log of Real GDP
LMC	Liberia Mining Company
LOP	Log of Openness
LWF	Log of Labor Force
LXP	Log of Exports
MDAs	Mineral Development Agreements
MNEs	Multinational Enterprises
NIC	National Investment Commission
NPFL	National Patriotic Front of Liberia
OAU	Organisation of African Unity
ODA	Overseas Development Assistance
OECD	Organisation of Economic Co-operation and Development
OLS	Ordinary Least Square
OP	Openness
OTC	Oriental Timber Company
PP	Phillips-Perron
PRS	Poverty Reduction Strategy
R&D	Research and Development
RGDP	Real GDP

SBC	Schwartz-Bayesian Criterion
SIC	Schwarz Information Criterion
TFP	Total Factor Productivity
TL	Trade Liberalization
TNCS	Transnational Corporations
UNCTAD	United National Commission for Trade and Development
UCEM	Unrestricted Error Correction Model
USA	United States of America
VAR	Vector Auto Regressive
WF	Working Force
WDI	World Development Indicator
XP	Exports

CHAPTER ONE

INTRODUCTION

Background to the study

In this chapter, discussion to the background of the study, the purpose for which the study is undertaken is carried out. It also deals with the statement of the problem, significance, scope of the study, objectives and hypotheses as well as the organisation of the study.

This study aims to investigate the relationship between foreign direct investment and economic growth in Liberia. Its aim is to authenticate or refute the conventional view of positive effects of FDI on economic growth. The study is also intended to assist in the formulation of policies towards these issues.

It has been established that the gap between the world's rich and poor countries largely comes down to the financial and physical assets that create wealth. Developed economies generally possess more of this kind of assets than developing ones, and what they have that gives them an edge over undeveloped countries usually incorporate more advanced technologies. The implication is that a key aspect of economic advancement lies in poorer nations' capacity to acquire more capital and scale the technological ladder. Emerging economies undertake some capital formation on their own, but in this era of pervasive globalization, they increasingly rely on foreign capital (Glass & Saggi, 1998).

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Foreign capital has played a significant role in the process of economic development of many developing countries, but the subject is still highly controversial. The debate on the issue dates back to the 1950s when many capital-deficient countries resorted to foreign capital as the primary means to achieve rapid economic growth. Unfortunately, the growth experience of many of these countries has not been very satisfactory. As a result of this kind of strategy, these countries accumulated a large external debt and are now facing unavoidable servicing or relief remedies (Fole, 2003).

Though the most heavily indebted poor countries and low income countries of the world remain largely dependent on bilateral and multilateral aid for their development strategies, there are several reasons as to why foreign aid may be inimical to their economic growth. One line of argument attributes the negative impact of foreign aid on growth to government actions. Since foreign aid expands a government's resource envelope, it often relaxes its tax raising efforts and thus results in reduced tax revenues. The country's tax raising mechanisms may subsequently deteriorate, triggering the need for additional aid while dissipating the short-term beneficial effects of aid and creating a culture of dependency (Adam & O'Connell, 1999). Moreover, many critics of foreign aid refer to the tendency of large capital inflows to reduce government fiscal discipline (Levy, 1988). A larger resource envelope may additionally have a corrupting influence on governments since it relaxes its need to explain its actions to citizens.

A further important negative impact of foreign aid on growth involves a phenomenon termed the 'Dutch Disease'. The mechanism is as follows; when a part of the large windfalls of resources (in this case foreign aid) is spent on non traded goods and services in the host country, an excessive demand for this type of goods and services arise. As imports cannot satisfy this excess demand and due to domestic supply constraints, the price of non-tradable goods and services will consequently increase relative to the price of tradable goods. The subsequent appreciation of the real domestic exchange rate results in the loss of external competitiveness which, in turn, could lead to lower economic growth in the long-run (Wijnbergen, 1984). The theory of 'Dutch Disease' offers a possible explanation of the negative correlations between aid and growth found in numerous studies. Evidently, since 1990, total Overseas Development Assistance (ODA) has dropped by more than half with greater importance now being placed on alternative sources of capital to finance national development (ECOSOC, 2000) and Foreign Direct Investment (FDI) is now the largest source of foreign private capital reaching developing countries.

The potential role of foreign capital in accelerating growth and economic transformation has caused many developing countries to seek such investments to accelerate their development efforts. Promoting and attracting foreign capital in the form of foreign direct investment has therefore become a major component of development strategies for developing countries. In the case of African countries, the role of FDI as a source of capital has become increasingly important not only because of the belief that it can help bridge the savings–investment gap, but also

the belief of spillovers to domestic firms in host countries. Given the region's low income and domestic savings level, its resource requirements and its limited ability to raise funds domestically, it is obvious that the bulk of its finance for the future will have to come from abroad, mostly in the form of FDI, (Ajayi, 1999).

During the past two decades, Foreign Direct Investment (FDI) has become an increasingly important part in the developing world, with a growing number of developing countries succeeding in attracting substantial and rising amounts of inward FDI. According to International Monetary Fund (IMF) and the Organisation for Economic Co-operation and Development (OECD) definitions, FDI is an investment in a foreign company where the foreign investor owns at least 10 percent of the ordinary shares, undertaken with the objective of establishing a "lasting interest" in the country, a long-term relationship and a significant influence on the management of the firm. FDI which is done by Multinational Enterprises (MNEs) who are defined as firms that own a significant equity share (typically 50 percent or more) of another company (subsidiary or affiliate) operating in a foreign country. These MNEs can have an impact on many aspects of a host country's economy such as output, the balance of payments, and market structure, etc. It is believed, however, that bridging the gap in technology between the foreign country and the host country is the main beneficial impact of FDI, which in turn improves productivity and output growth of the host country, (Blomstrom, 1986).

Economic growth refers to the expansion of the national income - the total production of goods and services of a country over a given period. Economic

growth is usually measured by the pace of change of gross domestic product (GDP). Economic growth has important implications for the welfare of individuals. According to Sala-i-Martin (2002), aggregate growth is probably the single most important factor affecting individual levels of income. Understanding the determinant of aggregate economic growth is the key to understanding how to increase the standards of living of individuals in the world.

The relationship between FDI and economic growth has been an exciting and controversial topic for economists and which continues to be widely debated. Theoretically, as well as empirically, there are still inconclusive arguments for and against the role of FDI inflow in enhancing economic growth in a country. Whether FDI inflow is beneficial or not to economic growth, and what governments should do to attract and use FDI inflow effectively, are still a matter of considerable debate. In recent literature, much attention has been devoted to the impact of FDI on economic growth in host countries but what is the specific case of Liberia?

Theoretically, FDI in a neoclassical growth model promotes economic growth by increasing the volume of investment and the efficiency of that growth. In the endogenous growth model, FDI raises economic growth by generating technological diffusion from the developed world to the host countries, (Borensztein, Gregorio, and Lee, 1998). As summarized in Balasubramanyam, Salisu and Sapsford (1996) and De Mello (1999), FDI is a composite bundle of capital stock, know-how, and technology, and can augment the existing stock of knowledge in the recipient economy through labor training, skill acquisition and

diffusion, as well as by the introduction of alternative management practices and organizational arrangement.

Recently, many researchers have stressed the role of technology as one of the crucial drive engines of growth. Not every country, however, has the same possibilities to access advanced technology. Many less developed countries (LDCs) lack the necessary social infrastructure in order to innovate and must often recur to technology invented elsewhere and one of the channels whereby technology may flow from developed to developing countries is FDI (Ajayi, 1999).

FDI inflow to Liberia has had an interesting surge both in the number of projects and the amount of funds since the Open Door Policy of the 1960s. FDI inflows have played an important role as providing investment capital, stimulating export activities, introducing new labor and management skills, transferring technologies and generating job opportunities as well as supporting the Liberian civil war. However, Liberia like many LDCs still has some typical weaknesses that prevent it from absorbing FDI efficiently. Some of which are poor infrastructures, shortages of skilled physical and human capital, weak institutions, and corruption, (Taylor-made, 2001).

Although many studies on FDI and economic growth in developing economies exist, few studies on this subject have been done for Liberia, especially for time series data of the economy. This paper employs an endogenous growth model in which the technological progress is the primary determinant of economic growth. The growth model is then empirically tested to examine the

effects of FDI on economic growth for the period 1975-2009. The study also examine the nature of the relationship between FDI and domestic private investment (DPI) in Liberia for the period specified.

Statement of the problem

Liberia led an isolated, impoverished, and often precarious existence until well into the twentieth century. Its first 100 years often have been described as a "century of survival" because of the encroaching efforts of neighboring colonial powers. Although the American influence on Liberia's ruling minority was apparent, the impact of British interest was more pronounced before the beginning of an economic experiment in 1926 by the Firestone Tire and Rubber Company, an American firm whose name would become virtually synonymous with Liberia over the subsequent years. After World War II, the country was brought into closer contact with the outside world largely through the assistance of the United States in building a modern seaport and an international airport near the capital city of Monrovia.

The economic system, in keeping with an emulated American tradition, was founded on the principles of free enterprise, and in the 1960s and early 1970s foreign investment set in motion a wave of economic activities that saw Liberia operating in the world market as a leading African producer of iron ore and timber products as well as rubber. Its economic fortunes had also been enhanced through the flag of convenience system, devised in 1947/48 with United States assistance, which made the small republic the world's largest maritime registry and brought

additional income to the national treasury. Characterized as it was towards external trade, however, the economic system was dangerously vulnerable to changes in world commodity demands and prices, particularly to slowdowns in the economies of the industrialized countries upon which Liberia had become so dependent. These contingencies became reality in the late 1970s as the cost of oil rose on the world market and international recession reduced demands for Liberian raw materials exports.

From the perspective of the new growth theories, the transfer of technology through FDI to developing countries is especially important because most developing countries lack the necessary infrastructure in terms of an educated population, liberalized markets, economic and social stability that are needed for innovation to promote growth, (Calvo & Sanchez-Robles, 2002). Kumar and Pradhan (2002) noted that, apart from technology and capital, FDI usually flows as a bundle of resources, including organizational and managerial skills, marketing know-how, and market access through the marketing networks of multinational enterprises (MNEs). As a result, FDI plays a twofold function by contributing to capital accumulation and by increasing total factor productivity (Nath, 2005).

In contrast to the modernization perspective, dependency theorists argued that dependence on foreign investment is expected to have a negative impact on growth and the distribution of income. Bornschier and Chase-Dunn (1985) claimed that foreign investment creates an industrial structure in which monopoly is predominant, leading to what they describe as "underutilization of productive

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forces." The assumption being that an economy controlled by foreigners would not develop organically, but would rather grow in a disarticulated manner, (Amin, 1974). This is because the multiplier effect, by which demand in one sector of a country creates demand in another, is weak and thereby leads to stagnant growth in the developing countries. This argument is important as most FDI to African countries is in the natural resources sectors which have substantial barriers to entry (Pigato, 2000).

Furthermore, a number of studies did not find significant spillover effects on domestic productivity from FDI. In some studies, domestic productivity is found to be even negatively associated with the intensity of foreign presence. Examples include studies by Kokko, Tansini and Zejan (1996) on Uruguayan manufacturing sector, Aslanoglu (2000) on Turkey manufacturing, Haddad and Harrison (1993) on Morocco manufacturing industries, and Aitken and Harrison (1999) on Venezuela industries.

Given the conflicting theoretical views, many empirical studies have examined the relationship between FDI and economic growth in developing countries. There has been no substantial empirical research done to investigate whether a relationship exists between Foreign Direct Investment and economic growth in Liberia and, if it does, the direction of causality.

In the face of this research gap in Liberia about the contribution of FDI to economic growth and technology spillovers to domestic firms, this study seeks to investigate empirically whether capital inflows in the form of FDI to Liberia for the period (1975-2009) positively impacted economic growth and domestic

private investment and whether a long-run relationship exists among these variables. These are the underpinning issues this study seeks to address.

Objectives of the study

The main objective of this study is to determine the impact of foreign direct investment on gross domestic product in Liberia for the period 1975 to 2009.

The specific objectives of the study are to:

- Investigate the relationship between FDI and GDP in Liberia.

- Examine the relationship between FDI and domestic private investment (DPI) in Liberia.

- Examine whether there is any causal relationships among FDI, DPI and GDP in Liberia.

- Make necessary policy recommendations based on the findings of the study.

Hypotheses

The following are the null hypotheses that the study seek to test:

- There is no relationship between FDI and GDP growth in Liberia.

- There is no relationship between FDI and domestic private Investment (DPI) in Liberia.

- There are no causal relationships among FDI, DPI and GDP in Liberia.

Significance of the study

This study represents an attempt to determine whether an identifiable relationship exists between FDI and GDP in the context of Liberia. It is significant in the sense that it is the first single empirical work to be conducted using time series data, for the period specified, on FDI, GDP and DPI nexuses in Liberia.

Moreover, the results of this study can provide useful information to policy makers in helping to create economic models for the Liberian Economy in its quest for industrialization and economic development.

Finally, this research paper shall add to the extension of the frontier of knowledge in Liberia, especially in the area of econometric research that has acclaimed attention by state actors and academicians, thus providing a lead for further research.

Scope of the study

The study is limited to the period of thirty five years ranging from 1975 to 2009 inclusive. This is because it is within this period that some of the data needed for this study are available. The fundamental assumption in this work is that FDI enhances economic growth and augments domestic investment. As such, the study is designed to investigate the credibility of this statement.

Furthermore, as a proxy for domestic private investment/gross capital formation, the study uses investment as a share of RGDP. The study will discuss

the overall impact of FDI on economic growth and would not account for sectoral analysis due to lack of data for the various sectors.

The study utilizes the Neo-classical growth model which states that, in the long term, the growth rate of output per worker is dependent on the rate of labor-augmenting improvement in technology which, in turn, is determined by factor(s) not contained in the model (also known as exogenous factors). The unit root test and co-integration technique are utilized to verify the adoption of growth model for Liberia. Employing the Auto Regressive Distributed Lagged (ARDL) Model and Error Correction Model (ECM), we examine the speed of adjustment toward the long run equilibrium. A time series macro data set of Liberia collected from relevant sources is employed to test our hypothesis.

Organisation of the study

The study is organized into five chapters. Chapter One is the introduction which includes background to the study, statement of the problem, the objectives, hypothesis and scope of the study. Chapter Two introduces the recent trend of FDI and economic growth in Liberia and also constitutes the review of related literature, both theoretical and empirical studies of FDI and economic growth and the relationship between FDI and domestic investment. Chapter Three presents the theoretical framework, methodology and data sources. Chapter Four reports the econometric estimation results and discussion. Finally, Chapter Five provides the study's conclusion and policy implications as well as the suggestions for further studies.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter gives an overview of the Liberian economy and the policies for investments as well as trends of FDI in Liberia. The review of some activities of foreign firms over the period 1975-2009 to analyze their impact on the economy is also carried out. Some theoretical issues regarding the processes through which growth takes place, related empirical studies of FDI and economic growth by various authors, which is intended to help formulate and justify the hypotheses, are also discussed. The relevant methods in formulating the model for the empirical estimation of the study are lastly discussed.

The chapter is divided into five sections. The first section gives a brief overview of the Liberian economy, policies for investments in Liberia and some activities of foreign firms. The second section reviews some of the theoretical literature on growth. The third section reviews some theories on foreign direct investment. The fourth section reviews some pros and cons of FDI/Multinational Corporations (MNCs)/Transnational Corporations (TNCs) and finally, the last section reviews the empirical literature on FDI and economic growth and concludes with the excepted signs for the study.

Characteristics of the Liberian Economy

The Liberian economy is mainly characterized by two sectors namely: the modern and the traditional sectors. The modern sector generally comprises of foreign investments and technologies that focus on the extraction of iron ore, rubber and forest products. The manufacturing and financial service sub-sectors also form part of the modern sector. The modern sector had basically accounted for 70 percent of the export earnings and 50 percent of GDP prior to the civil conflict. On the other hand, the traditional sector, which makes up about 70 percent of the population is basically rural and depends on traditional method of agriculture and rudimentary technology. That is, the traditional sector engages in subsistence agriculture mainly for consumption and not for trade. The relationship between the modern sector and the rest of the economy is mainly in the form of profit sharing with the government, payment of income tax and duties on imported materials, (United Nations, 2001).

Like many economies in Sub-Saharan Africa, the Liberian economy heavily relies on trade in primary products and foreign aid. The heavy dependence on the exportation of primary products makes the economy vulnerable to fluctuations in prices on the world market. Also, the dependence on foreign aid makes the country more susceptible to the prevailing financial situations and the economic and political policies in donor countries. With these conditions, an efficient management of the economy is crucial but, unfortunately, gross economic mismanagement and lack of political will plunged the economy deeper

into a state of anarchy and war that saw the country deteriorate into one of the countries worst affected by a civil war.

Economic policies for investment in Liberia

Generally, the economic policy pursued by the Government of Liberia is identified with the principle of the free enterprise system. Like most developing countries, development is induced by plan. Planning, however, does not call for a fully planned economy or centralized economic decision-making. Rather, economic development policy is based on action programs of the Government aimed at allocating resources in the public sector through the budget. By this approach, it is hoped to achieve national goals as to induce maximum contribution by the private; domestic and foreign sectors, to the rapid growth of the national economy. This policy places major reliance on individual and private initiatives, (Cole & Cassell, 1970).

Open door policy

The principal policy measures for investment in Liberia are based on the Open Door Policy and the Investment Incentive Code. The Open Door Policy which is an open invitation to foreign capital for investment in Liberia is based on broad commitments by Government to foreign private investments in which freedom of movements of capital, including repatriation of dividends, profits and capital are given. This policy also grants to foreign private businesses operation in

Liberia the privilege of organizing either as an entirely foreign private entity, in partnership with Liberians or in partnership with the Government of Liberia.

The investment incentive code

The Investment Incentive Code, which represents the other basic policy for investment, includes standard provisions which were passed into law by an act of the Legislature on April 15, 1966. This law provides standard incentives for taxes and other privileges to new business ventures. These include up to 5 years exemptions from customs duties and income taxes both of which are determined on the basis of the nature of the activity to be undertaken. The purpose of the Code was intended to simplify as well as accelerate decision making on investment proposals as well as to standardize the general conditions under which private capital at this level of investment can be employed in the Liberian economy, (Cole and Cassell, 1970).

Macroeconomic performance period (1975-1979)

A prominent feature of the Liberian economy is its heavy dependence on external trade. Following the period 1970-1978, the Liberian economy showed considerable improvement. GDP (at factor cost) increased on the average by 9.7 per cent annually from US$ 141 million to US$ 840.0 million at the end of 1978 and declined the following year by 3.1 percent. The performance of the economy was accredited to the manufacturing and government sectors due to the increased growth in GDP. Manufacturing, which was only 6.4 per cent of GDP in 1975

increased to 10.1 per cent in 1979. The share of the government sector in GDP rose from 7.7 percent in 1975 to 11.7 percent in 1979. The increased contribution to GDP was attributed to increased activities in the construction sector as preparations for hosting the OAU Summit in 1979 was underway. The agriculture sector which accounted for about 31.5 per cent of GDP in 1975, declined by 22.3 per cent by the end of 1979 and its share in GDP dropped considerably to about 17.2 percent. The contribution of the mining sector was at 41.7 per cent of GDP at the end of 1975, but declined to 15.6 per cent or $126.8 million in 1979 due to the decline in the production of iron ore, as one of the iron ore mining companies' ceased operation in 1977, (Toby, 2006).

Macroeconomic performance (1980-2003)

Typical of African countries, the Liberian economy is dualistic in nature and is comprised of the formal sector dominated by an assortment of activities and the informal sector which consists mainly of subsistence farming and services in the urban areas.

Fundamentally, the performance of the Liberian economy, commencing from the 1980's to 2003, demonstrated a drastic and persistent fluctuation in the pattern of GDP. It is no doubt that the civil war had a number of harrying effects on the economy and the people of Liberia. The conflict resulted in the deaths of approximately 270,000 lives, (PRS Republic of Liberia, 2008). Institutions and infrastructures were also destroyed. The economy collapsed, impoverishing many of the surviving Liberians. The situation was further exacerbated by a massive

exodus of skilled individuals from the country. GDP fell tragically by 90 percent between 1987 and 1995, one of the largest economic collapses ever recorded, as average income in Liberia was one-fourth of the level in 1987, (Toby, 2006). Agricultural production (including rubber and forest products), mining activities, manufacturing and financial services, as well as all revenue generating activities, were reported to have fallen greater than 60 percent each between 1987 and 2005. Electricity production also ceased as the nation's only power source was damaged. Thus, the bulk of the population turned to the use of charcoal, fuel wood and later to tiger generators to meet their basic energy requirements, (PRS Republic of Liberia, 2008).

Macroeconomic performance (2004-2009)

The ending of civil war in Liberia has contributed significantly to the growth of the economy. Economic activity rebounded in 2004, returning to about 70 percent of the pre-war level. In 2005, GDP was estimated to have grown at 5.3 percent, reflecting the gradual improvement of security in rural areas, and the restoration of activity in those sectors benefiting from donor assistance. The medium-term economic prospects depended critically on the maintenance of security nationwide and the timely provision of increased support from development partners. The lifting of the UN sanctions on timber and diamond exports attracted large inflows of foreign direct investment and contributed to strong export performance, (ADB, 2006). In its report on the Liberian economy in January 2008, the International Monetary Fund (IMF) noted that the government

has continued to make good progress in implementing key policies under an IMF-monitored program, despite severe capacity limitations.

Economic outlook of 2004, 2005, 2006 showed that Real GDP increased by 2.6 percent in 2004, 5.3 percent in 2005 and 7.8 percent in 2006, reflecting the gradual improvement in security in rural areas, post-civil war construction, and notably the contribution of a large donor presence to the services sector and reconstruction activities. Furthermore, 2007-08 was broadly favorable, with GDP growth for 2007 recorded at 7.8 percent, supported by a continued recovery in agriculture, post-war reconstruction, and the impact of a large donor presence in the service sector. Economic growth in 2008 was initially projected at 9.5 percent, but was later adjusted to 7.1 percent; mainly resulting from delays in the resumption of mining activities and full-scale forestry operations, (CBL Annual Report, 2004, 2005, 2006, 2007,2008).

Expansion of the economy was projected to be primarily driven by the Agriculture and the Services Sectors, accounting for 42.2 percent and 25.8 percent, respectively, of overall projected real GDP for 2008, (CBL Annual Report, 2008). With regard to public finance, government revenue has recovered strongly since the restoration of peace, from 12.9 percent of GDP in fiscal year 2004 to 14.8 percent of GDP in fiscal year 2006. Government accumulated cash budget surpluses amounting to 0.8 percent of GDP in fiscal year 2005 and 4.5 percent of GDP in fiscal year 2006, (CBL Annual Report, 2006). Figure 1 gives a graphical display of RGDP performance in Liberia for the period 1975 to 2009.

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RGDP, as displayed in Figure 1, is shown to have increased from $ 712.03 dollars in 1975 to 920.49 dollars in 1979.
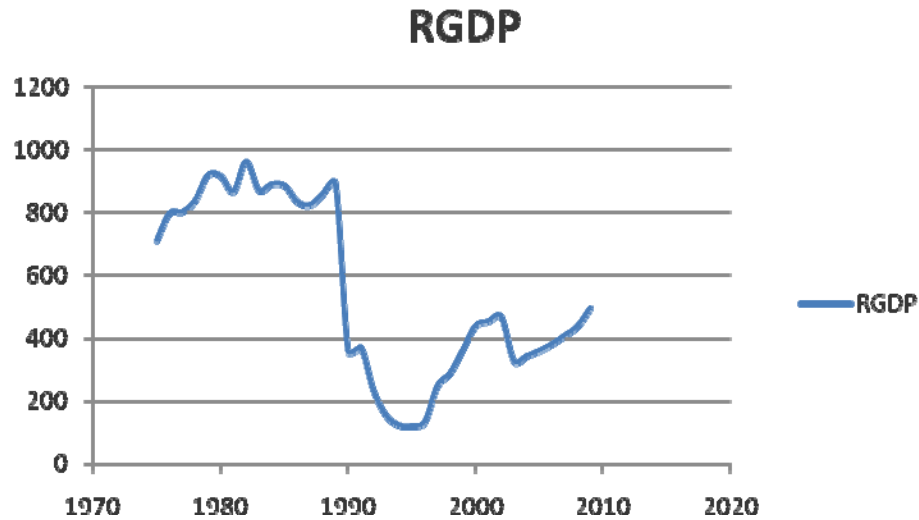
Figure 1: Real GDP at constant (2000) US Dollars

Source: IMF statistics (1975-2009)

RGDP is shown to have been increasing until 1980. It had begun to decrease in 1981 with the inception of the new military government of Samuel Doe and continued to decrease to a minimum of $358.26 dollars in 1990 when the civil war started. This windfall continued due to the civil conflict that left the economy deteriorated as shown by the fall in RGDP to $118.70 dollars in 1995. After the cessation of the civil conflict with Charles Taylor coming to power in 1997, RGDP started to increase from the shocking decline in 1995 to $439.97 dollars in 2000 and started to decline to a minimum of $327.25 dollars in 2003 due to the escalated conflict that lead to the departure of Charles Taylor. Since then, a slow but steady increase in RGDP started in 2004 from $342.87 dollars.

Since then, there has been a slow but gradual improvement as 2007 figure shows an increase of $408.71 to 496.55 dollars in 2009.

Activities of foreign companies

In the 1980s, Liberia was one of the region's more economically advanced countries. Its gross domestic product (GDP) per capita was averaging about US$438.834 and life expectancy at birth exceeded 54 years. These were then among the highest indicators in Sub-Saharan Africa. Economic activity in Liberia's formal sector in the pre-civil war years was heavily concentrated on the production and export of iron ore, natural rubber, timber and crops, including coffee, cocoa and palm products. A large traditional sector was engaged primarily in subsistence agriculture, artisanal mining and small-scale commercial activities.

Prior to the civil war, there were three major mining companies operating in Liberia: Liberia Mining Company (LMC) of Bomi Hills, established 1945 with an investment size of US$40,000,000. The then largest mining company located in Nimba County, Liberia American Swedish Minerals Company (LAMCO) was established in 1953 with an investment of US$275,000,000 and the Bong Mining Company (BMC) of Bong Mines, established in 1958, investing US$100,000,000. The operations of these companies brought some major developments to the country. For example; LMC constructed a bridge to necessitate access to the port of Monrovia. Another major investment was that of LAMCO building of the Port of Buchanan for the export of its ores to oversee partners and through this effort,

the business community had access to the port and that brought a boast to the business community and the economy in general (Cole & Cassell, 1970).

For several years, up to the advent of the civil war in 1990, the Liberian economy relied on the extractive sector; which consisted mainly of iron ore- generating over fifty percent of Liberia's export earnings, unprocessed timber and rubber and other basic products such as diamonds, coffee and cocoa accounting for the remaining 50 percent. The manufacturing sector remained relatively small and predominantly foreign-owned. The iron ore sector came to a complete stop, as the three major concessions in Bong Mines, Nimba and Bomi Hills were constrained to close their operations. It was only during the 2003 Interim Government that this sector started to operate again.   The decade-long civil conflict largely destroyed the Liberian economy in real terms for which Liberia was resultantly classified by the United Nations as one of the least developed countries in the world due to its low average per capita GDP (US$177 in 2000, less than half the value in the 1980s), lack of economic diversification and poor prospects for sustained economic development.

The political volatility introduced by the military coup d'état of 1980 and superimposed upon by ten years of civil war, had a devastating impact on the Liberian economy. In the 1980s, the logging industry expanded unsustainably— producing almost three million cubic meters (m^3) a year. But the industry stagnated during the civil war of the 1990s. Once Charles Taylor gained power in 1997, resurgence in harvesting began, and timber became an important source of revenue for his government. Most of the logging was pre-financed by buyers, as

capital is extremely scarce for loggers in Liberia. During this period, illegal timber production was one of the main sources of funds for the then National Patriotic Front of Liberia (NPFL) Government of Charles Taylor. Timber production in Liberia was estimated at 934,000m^3 then worth about US$187 million at world market prices (an average of US$ 200 per m^3) with exports worth just under US$130 million (Taylor-made, 2001).

Historically, the United States has been the major recipient of Liberian exports. But during the civil conflict, nations other than the USA were major importers of Liberian timber regardless of the supplier. In 1991, for example, during the civil war when the NPFL was in control of nearly all of Liberia's territory with the exception of the capital, Monrovia, and controlled nearly all of its timber exports, France imported 94,400m^3 of round logs from Liberia, worth approximately US$19 million at current prices. Furthermore, China, another major importer of Liberian logs during the civil war, declared imports of just over 290,000m^3 of logs from Liberia in 2000, therefore contributing a minimum of US$33 million to the parallel timber budget. For the period 1996-2000, China, France and Italy accounted for $34, $33 and $16 million, respectively, which represented 78.3percent of total logs exported from the country. By 2002, one million m^3 of logs were exported; almost 60 percent to China and 28 percent to the European Union — although the exact amount remains unknown because reporting was so poor, (Taylor-made, 2001).

It is unquestionable that the worldwide predatory transnational industry traditionally approaches leaders of countries with large forest resources and weak

institutions. Abiding by "local business practices", it negotiates deals to extract raw materials as cheaply as possible. This mode of doing business suits the warlord economy extremely well. Predatory transnational companies have no allegiance to a given country, nor do they abide by local laws and regulations unless obliged by their hosts. Their ability to operate relies on direct deals with the ruling elite and the continued demand for their products: iron ore, timber, rubber, diamond, gold etc in this case by consumers unconcerned with, or ignorant of, the source of their goods. In this way the global market for these products play into the hands of warlord leaders such as the likes of Charles Taylor who responded to market opportunities to maximize his personal benefits.

Oriental Timber Company (OTC) one of the most notorious logging company in the country during the civil war, investing more than US$ 100 million in logging equipments and operation, while holding approximately 1.6 million hectares representing 42 percent of Liberia's total productive forests, was one of the main sources of the NPFL finances. Commercial activities in forestry have attracted most of the FDI into Liberia during Taylor's regime, with logging being the largest provider of foreign currency prior to 2003.

For its first year of operation, OTC imported "skilled" labor from Indonesia (600-800 workers) driving trailers and bulldozers and occupying the managerial positions in the field and at the port of Buchanan. Although there was no training as promised and publicized, Liberians constituted the majority of the OTC casual workers but a lesser percentage of its skilled workforce. OTC maintained armed guards to keep everyone else out of its logging sites and the

Port of Buchanan. Forestry Development Authority (FDA) officials complain that they are required to provide the necessary hammer marks and approvals off-site without ever inspecting OTC's logging operations.

Interestingly, these were activities carried out by some foreign business firms in the country over the period. Some showed positive signs while others had major negative impact on the economy.

Investments update in Liberia (2006-2009)

The end of the civil crisis has seen the influx of many foreign companies in Liberia. Licenses have been given to a number of companies for mineral exploration, mainly gold, diamond, iron ore and logging.

Investment Inflows as at December 31, 2009, the National Investment Commission processed and approved the total of 19 investment projects valued at US$127,803,437 million with a job creation potential of 1,570. The processed and approved project is concentrated in the area of manufacturing, agriculture, processing, exploration and service. Table 1 shows Investment Inflow update for the period 2006-2009.

Although the mining sector has not resumed full activities since the end of the civil war, it has made significant strides since the beginning of 2006. During that year, tenders for the exploitation of iron ore in the Western and Central regions were launched. For example, Arcelormittal one of the world's largest still company made an investment of over $1.5 billion dollars in Nimba county and other parts of the country, China Union with $2.6 billion investment in the Bong

Mines iron ore deposit and the Sime Darby oil palm concession of $800 million investment, etc. (NIC Annual Report 2009) were all major investment project signed by foreign companies and the government of Liberia.

Table 1: Investments update (2006-2009)

Sectors	2006	2007	2008	2009
Manufacturing	$19,054,220	$56,301,603	$5,796,972	$39,032,934
Service	$27,302,145	$9,251,352	$55,269,248	$44,087,932
Mining	$4,494,510	$3,544,568		
Agriculture		$13,078,672	$5,000,000	$5,250,363
Construction	--	$15,023,527		
Processing	--	--	$66,485,420	$4,432,208
Exploration				$35,000,000.
Total	$50,850,875	$97,119,767	$132,551,640	$127,803,437

Source: NIC Annual Report (2009)

It is expected that these direct foreign investments will increase employment level, government revenue generation (particularly foreign exchange earnings), and improve infrastructure of the country.

Besides the iron ore projects, a number of Mineral Development Agreements (MDAs) such as BHP Billiton with US$2.5 billion MDA negotiations and three oil Exploration Contracts with Anadarko Petroleum, Tongti and NOCAL Valued over US$75 million were also signed between the Government of Liberia and these private exploration companies. (NIC Annual Report, 2009).

Employment

Total employment rose to an estimated 295,354 during 2008, from 141,581 in 2007. The private sector continues to provide a greater share of employment in the economy. During 2008, it accounted for about 84.0 percent of estimated number of people employed in the formal sector. Total formal sector employment in the country during 2009 was approximately 124,755 compared favorably with a total of 106,968 in 2008, an increase of 16.6 percent. Of the aggregate number of employment, public sector employment totaled 34,000 persons, while private sector employment stood at 90,755 persons. Employment in the informal sector, an important contributor to the growing level of economic activities, was estimated at 569,790 in 2009, up from 487,000 in 2008. The rise of 82,790 in the number of persons engaged in informal activities provides a window of opportunity for policy makers to exploit in harnessing potential contribution to growth of the economy through the provision of capital and capacity building with a view to mainstreaming informal sector activities into the formal sector, (CBL Annual Reports, 2008, 2009).

The growth of the economy during 2009 was projected at 4.6 percent, revised downward from an earlier projection of 12.7 percent. The slowdown in economic activities was mainly due to delay in the full resumption of activities in the Mining and Forestry Sectors. Foreign direct investment in these areas was lower than expected, mainly on account of the global economic meltdown, and further occasioned by weak external demand and low prices for primary commodity exports such as coffee, cocoa, rubber, iron ore, logs and diamonds.

This affected revenue generation and lowered the level of employment in key sectors, (CBL Annual Report, 2009).

Regional flow of FDI

The recent surge of FDI inflows to the African region, particularly over the period 2001– 2007, followed from the twin forces of an upward spiral in commodity prices and a more positive climate for investments in the region backed by reform of policy frameworks for FDI, including, among others, natural resource exploitation. In many countries, inflows rose mainly in the primary and services sectors, partly through the existence of vast natural resources and a wide range of national privatization schemes.

Furthermore, in parts of the region, political conflicts and related sanctions on their economies have decreased and efforts have been undertaken to strengthen governance-improving economic performance at a time when commodity prices have been rising rapidly. As a consequence, the region's largest natural resource producers – such as Angola, Algeria, Libyan Arab Jamahiriya, Mozambique, Nigeria and South Africa, which account for roughly three quarters of the region's commodities exports, also accounted for more than three quarters of the region's FDI inflows. Moreover, countries not traditionally known for large reserves of natural resources – such as Ethiopia, Ghana, Kenya, Mauritania, Somalia, Uganda and Liberia also became exploration hot spots, with Transnational Corporations (TNCs) investing billions of dollars in many of their projects, (UNCTAD 2008).

While worldwide flows of foreign direct investment have declined in the last year due to the global financial crisis, FDI remains a major source of international capital for both developed and developing countries (global FDI inflows were $1.7 trillion in 2008). The rise in foreign direct investment has been partially driven by the liberalization of financial regulations which has opened up previously untapped markets to transnational capital. Additionally, many developing countries have actively courted foreign investors because of the promise of productivity improvements and overall economic growth (Graham, 1995). Even in the recessionary climate and increasingly protectionist atmosphere of 2008 and 2009, countries have increasingly lowered barriers to foreign direct investment, scrapping performance requirements and reducing corporate income taxes, (UNCTAD, 2009).

As a result, many developing countries were able to attract sufficient FDI inflows. For example, in 2008, FDI inflows to LDCs increased throughout the first six months, before a slowdown during the latter part of the year. Nevertheless, for the year as a whole, a net increase in inflows, from $22 billion in 2007 to $30 billion was recorded. There was also a rise in investment in Liberia, for instance, Sime Darby's (Malaysia) invested $800 million in the Guthrie rubber plantation in Liberia in 2009, (UNCTAD 2009).

Liberia has attracted a considerable amount of FDI since its establishment as one of the world leading exporter of iron ore, timber and rubber. Reports show that foreign investments made in 2006 and 2007 were $97,119,767 and $132,551,640, respectively. As at December 31, 2009, a total of 19 foreign

investment projects valued at US$127,803,437 were recorded, signifying an increase in foreign private investment in the country, (NIC Annual Report 2009).

For a graphical presentation of FDI inflow in the Liberian economy for the period under consideration, see Figure 2.
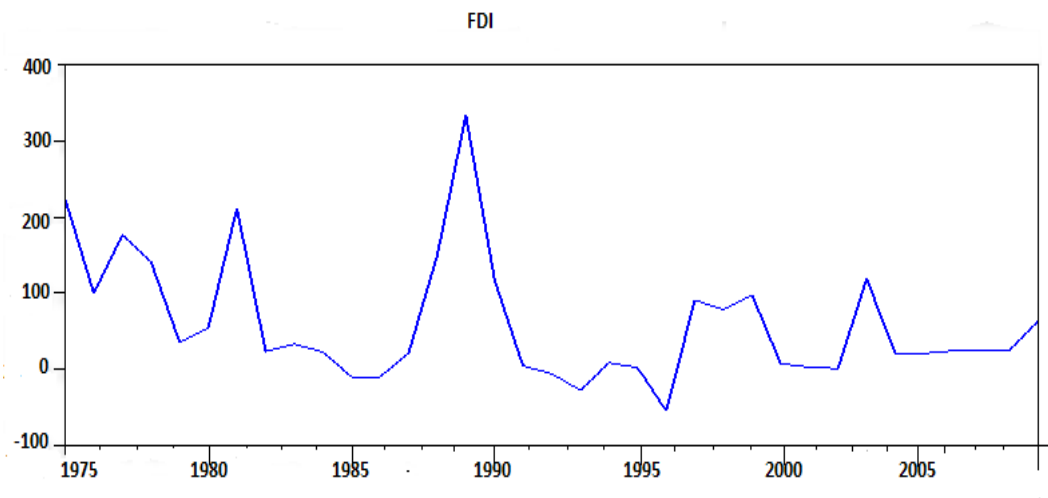
Figure 2: Net FDI inflow (1975-2009)

Source: IMF Statistics (2009 CD ROM)

From Figure 2, it is clear that FDI in Liberia has had an unpredictable trend. In 1975, FDI inflow was recorded at $180 million with a reduction in 1979 to $41 million. In 1981, FDI was recorded at about $287 million and decreased to $49 Million in 1983. It also showed a steep increase between 1989 and 1990 from $656 million to $225 million and decreased sharply in 1991 up to 1996 with figure recorded at - $132 million primarily due to the Liberian civil conflict. It began to increase in 1997 to the amount of $214 million and took a decrease to $20 million in 2000 from which it increased in 2003 to $372 million and then decreased in 2004. It began to increase gradually in 2005 and has continued to do so with figure for 2009 recorded at $378 million.

Overview of the Neo-Classical Theory

Neo-classical theory, in all its forms, shows a strong tendency to reduce the economic complexity of the analysis, doing so by holding the institutional framework constant. In terms of the initial neo-classical theory described by Solow (1956) and augmented by others, sustained economic growth occurs through an exogenous factor of production, that is, the passage of time. The neo-classical production function used in this theory relates output to factor inputs, which consist of stock of accumulated physical capital goods (buildings, machinery, transport equipment, computers and so on) and labor--regarded as only one type. The theory imposes decreasing returns with respect to the use of (reproducible) factor of production (and constant returns overall).

From these assumptions it follows that an increase in the stock of capital goods will result in a less than proportionate increase in output, provided the amount of labor employed stays the same (Van der Ploeg & Tang, 1992). Eventually more capital stock will produce no more output, resulting in lower profits, and for this reason output growth cease. If new technologies improve the productivity of labor and of capital and so prevent a decrease in the rate of return on investment, the labor force will grow at an exogenous rate. The growth of output is accordingly related to the amount and quality of the stocks of production factors-that part of output growth that cannot be explained by economic researchers and/or total factor productivity in applied work. The calculation of total factor productivity assumes prefect competition in labor and capital market, but also in product and service markets. This assumption allows the calculation of

multifactor inputs by weighing labor and capital input increases in terms of their national income shares (remuneration of employees and gross operating surplus respectively). This joint factor contribution to output is usually substantially less than the growth in output.

This unexplained part of output growth is often called the Solow residual, which he termed the "measure of our ignorance". This is rather an ambiguous phrase, because it refers to the nebulous knowledge of economists on the matter but signifies improvement in the knowledge base of the workforce in general. The labor force grows in accordance with population growth and is augmented by technical progress, both exogenously determined. Eventually capital, output and consumption will also grow at this exogenous rate and converge to an equilibrium growth path. Accumulation of capital in exogenous growth theory is a vehicle for ongoing technical development. Neo-Classical theory gives no economic explanation for such development, but instead includes a time trend, usually representing technical progress in the model for the long-run rate of economic growth. The exogenous technical progress assumed in the older versions of growth limits the explanation of the growth process. When the standard Solow model is used with real data in order to explain adjustment to balanced growth paths, predictions for the speed of convergence and the capital income share in national income are generally too high.

Exogenous growth theory

The Neo-classical model states that, in the long term, the growth rate of output per worker is dependent on the rate of labor-augmenting improvement in technology which, in turn, is determined by factor(s) not contained in the model (also known as exogenous factors). The model implies that all economies that use similar technology, which could improve over time, should have converging growth rates. Permanent differences in productivity levels are caused by faster/slower population growth or a higher/lower savings rate. Lower productivity could be due to climate deficiencies or other factors not accounted for in the model.

The Cobb-Douglas production function, also called the Neo-Classical production function, is expressed as follows:

$$Y = L^a K^b T \tag{1}$$

Where $(a + b) = 1$, Y=output, L=Labor, K=capital and T= the rate of technological progress which changes over time. The weights (a and b) represent the proportion of output (Y) that accrues to Labor (L) and capital (K) respectively. The inclusion of the technology variable freed the Neo-Classical theory from the doom-saying of Malthus and Ricardo and formulated the ultimate destiny of mature economies in terms of the more acceptable but still rather conservative stationary state and where all real variables grow at a constant, proportional rate. Solow (1970) remarked that "the steady state is not a bad place for the theory of growth to start, but may be a dangerous place for it to end".

The simple Solow (1956) model depicts the output, Y, of a business, as a function of three variables: capital, K, labor, L and knowledge or "effectiveness of Labor", A_t.

$$Y= K^{\alpha} A_t L^{1-\alpha} \qquad 0< \alpha < 1 \qquad (2)$$

Knowledge or technical progress is assumed to be independent of both the capital and labor inputs and to be a non-rival good, which is free for all businesses. It appears multiplicatively with labor in equation (2), denoting that knowledge contributes by augmenting labor and not affecting capital. The exponents (α and (1- α) measure the relative contribution of the two inputs of capital and "effective labor". These exponents add to unity, to comply with the constant-returns-to-scale assumption for production. Equation (2) describes how actual output is determined. The equation is simplified by taking natural logarithm, after which the equation indicates output growth so that:

$$y= \alpha k +(1-\alpha)(a +l) \qquad (3)$$

Lower-case letters represent the proportional growth rates of their upper-case equivalents. This equation may be rewritten as:

$$y-l= ak'+ a \qquad (4)$$

where: y-l = the growth of output per worker, k'= the growth of capital per effective worker(K/AL). Please see Appendix H for derivation of equation 4.

To see what the Neo-Classical growth model predicts, we can simplify matters by assuming that there is no labor force growth (annual entry to the labor market is equal to annual retirement) - a situation not too far removed from the reality in many countries. This means that, in terms of equation (4), y equals the

growth of income per worker (i.e., labor productivity). This model has three important features which recent growth theories have challenged:

- If markets are competitive, the contributions of each factor input to output (i.e. α and $(1-\alpha)$) are equal to their respective shares in the total income (output). For all businesses in an economy taken together, this could be approximated by the national accounts breakdown into wage and non-wage income.

- If people were to save a constant proportion of their income, capital per effective worker would be constant in the long run, so that k' = 0 in (4) and per capita income growth is therefore entirely determined by knowledge growth, α.

- Increasing the savings (i.e. investment) ratio could raise an economy's income level (permanently) by raising the growth rate of capital (and income) in the short run, but since the ratio of savings to income cannot continue to increase indefinitely, investment cannot cause income to grow permanently. Countries that invest more would be wealthier but would not grow faster since the only source of long-term growth is technical progress (or knowledge accumulation), which is assumed to occur at an exogenous rate. According to this model, income growth rates are beyond business and government control. This is a disappointing and dubious outcome because real-life experiences point to the contrary, especially in the case of businesses.

Endogenous growth theory

Endogenous growth embraces a diverse body of theoretical and empirical work. The empirical work does not settle for measuring a growth accounting residual that grows at different rates in different countries. It tries instead to uncover the private and public sector choices that cause the rate of growth of the residual to vary across countries. The endogenous growth theory has sparked and retained the interest of social scientists since the publication of Romer's article in 1986. This interest is witnessed by the spurt of research papers during the late 1980s and in the 1990s. Two mainstreams of endogenous growth theories have emerge, namely those focused on technological change and those mainly concerned with human capital.

Technological advances occur as a result of things that people do. The endogeniety of technological progress by observing that no economist is willing to make a serious defense of the proposition that technological change is literally a function of elapsed calendar time. Even if discoveries are made only by chance, more discoveries will be made if more researchers work to produce them, (Romer, 1994).

While the traditional growth theory considered only two factors of production, namely capital and labor, this new growth theory adds a third, technology. Endogenous growth theory focuses on the wider concept of technology, which is expressed through ideas, instead of objects or products. It necessitates a different set of institutional arrangement, like pricing systems, taxation or incentives to ensure the efficient allocation of ideas. These types of

models are sometimes called Schumpeterian models because Schumpeter emphasized the importance of temporary monopolistic power over discoveries, as a motivation force for continued innovation processes. Romer (1994) makes a convincing argument for perpetual and even acceleration growth as he is of the opinion that: "We will never run out of things to discover, a reassuring fact since the process of discovery is the mainspring of economic growth."

Growth accounting theory

Growth accounting is an attempt to allocate growth rates in national output or output per person employed to the determinants of output in order to isolate the causes of growth. The aims are to determine the causes of international differences in output levels and the determinants responsible for differences in growth rates. This is also a method to organize quantitative information conveniently and systematically. Growth accounting stems from an investigation by Denison (1987) of the sources of growth in the USA from 1909 to 1958. It has also been used to estimate probable future growth potential (obtained by adding the expected contributions of these sources) and the extent to which the future growth rate could be altered by each of a list of alternate sources.

Among the output determinants that were examined were the characteristics of labor that affect its knowledge, skills and energy. This was criticized by Schultz (1961) who made the point that "treating a count of employed persons as a measure of the quantity of an economic factor is no more meaningful than it would be to count the number of all manner of machines to

determine their economic importance either as a stock of capital or as a flow of productive services".

Denison (1987) nevertheless found the following to be the most positive sources of growth:

- Increased employment;

- Improved education of the employed;

- More and better capital stock;

- Growth in the size of markets;

- Improved resource allocation;

- Advances in the extent of knowledge relevant to production.

The study's most important lesson was that extensive and costly changes would be required if policies were to be adopted to raise the high-employment growth rate above its normal level. This finding contrasted with the common view that it would be easy to add a whole percentage point to the growth rate.

Theories under foreign direct investment

Certain theorists have attempted to address limitations of international trade theories under the rubric of FDI. A selection of these will now be discussed which concern market imperfections theory, international production theory and internalization theory.

Market Imperfection Theory

The market imperfections theory states that firms constantly seek market opportunities and their decision to invest overseas is explained as a strategy to

capitalize on certain capabilities not shared by competitors in foreign countries (Hymer, 1970). The capabilities or advantages of firms are explained by market imperfections for products and factors of production. That is, the theory of perfect competition dictates that firms produce homogeneous products and enjoy the same level of access to factors of production.

However, the reality of imperfect competition, which is reflected in industrial organisation theory (Porter, 1985), determines that firms gain different types of competitive advantages and each to varying degrees. Nonetheless, the market imperfections theory does not explain why foreign production is considered the most desirable means of harnessing the firm's advantage. Dunning (1980) and Fayerweather (1982) have addressed this issue and developed what can be described as international production theory.

International Production Theory

International production theory suggests that the propensity of a firm to initiate foreign production will depend on the specific attractions of its home country compared with resource implications and advantages of locating in another country. This theory makes it explicit that not only do resource differentials and the advantages of the firm play a part in determining overseas investment activities, but foreign government actions may significantly influence the piecemeal attractiveness and entry conditions for firms. A related aspect of this foreign investment theory is the concept of internalization which has been

extensively investigated by Buckley (1982, 1988) and Buckley and Casson (1976, 1985).

Internalization Theory

Internalization theory centers on the notion that firms aspire to develop their own internal markets whenever transactions can be made at lower cost within the firm. Thus, internalization involves a form of vertical integration bringing new operations and activities, formerly carried out by intermediate markets, under the ownership and governance of the firm.

Some pros and cons of FDI/MNCs/TNCs

Foreign direct investment (FDI) is regarded by economists and policy makers as today's chief means of economic development and growth. Unlike the flighty nature of portfolio investment, FDI tends to focus on the longer term investment window and is thereby more reliable. For this and other attractive traits, FDI is now treated more than ever as the capital flow of choice, (Braunstein and Epstein, 2002). For one, FDI spreads capital, technology and management skills across the globe - all the crucial ingredients for economic growth and development (Crotty, Epstein & Kelly 1998). For developing countries, it is assumed that FDI provides the much needed funds for upgrading the economies and fosters economic growth through technology transfer and spillovers.

First of all, it is well established that multinational corporations (MNCs) or transnational corporation (TNCs) are the main sources of FDI. In general, they

possess more advanced technology managerial skills as well as sufficient capital. When MNCs decide to penetrate a new market through directly investing in a country, they tend to bring with them more sophisticated technology and superior managerial practice in order to compete with local firms who tend to be more familiar with the consumer preferences and business practices in the local market (Blomstrom & Sjoholm, 1999).

It is reasonable to assume that some of the technology and the experience brought in by MNCs will inevitably be diffuse from their affiliates to the local indigenous establishments of the host economy. Secondly, economic relations with MNCs/TNCs provide learning opportunities for the domestic firms and thus reduce their innovation and imitation costs which will in turn speed up the improvement in total factor productivity (Helpman, 1999). Thirdly, workers and managers employed and trained by the MNCs/TNCs may later either move to the local firms or establish businesses of their own. In both cases, the pool of 'the knowledge of getting things done' in domestic industries is expanded.

Technology spillovers as been discussed works mainly among firms within industries. Spillovers may also work through the backward and forward linkages between suppliers and supporters. MNCs/TNCs, through their local affiliates, may provide technical assistance to local suppliers or prospective suppliers. MNCs/TNCs entry into the domestic market will intensify competition and force local firms to improve efficiency and to adopt new technologies (Kokko, 1996). Technology advances due to increased competition may be both intra- and inter-industries.

Multinational enterprises (MNEs) usually come to host country with a package, including capital, technology, and management and marketing skills. They, thus, can improve competition, efficiency, provide additional jobs, and help the income distribution improvement. Transnational Corporation (TNCs) generally have world leadership in innovation and product differentiation; they can access directly and easily the world's largest markets; and have the managerial, entrepreneurial and financial resources to develop viable production bases in Less Developed Countries (LDCs), (Lall, 1985; Vernon, 1977).

Accordingly, LDCs need to pursue their developmental policies aiming at promoting economic growth and improving the quality of life, while at the same time closing the gaps with developed countries. It is argued that FDI can help LDCs in filling the gaps between the targeted and desired investment, foreign exchange constraint, government revenue-expenditure, skills, technology and entrepreneurship which inhibit developing countries' thrust for economic growth (Todaro, 1989; 1994). Filling these gaps has a vital importance for LDCs to speed up their economic development. This is so because TNCs possess a 'package' of attributes which coincide with the gaps constraining LDCs' economic development. A marriage between LDCs and MNCs/TNCs therefore seems logical and FDI is seen in LDCs as a source of exchange earning; a supplement to low levels of domestic savings to finance investment; a tool of encouraging exports; and as a means of technology transfer.

Undoubtedly, one of the important gaps to be filled for a Less Developed Country (LDC) is the saving-investment gap. This gap is explained within the

context of Nurkse's vicious cycle hypothesis. In this view FDI is essential to break this vicious cycle to unleash the development potential of LDCs by allowing the savings of investors from the developed countries to augment the low savings in the LDCs in the quest for development. The vicious cycle hypothesis argues that low savings lead to low investment, which in turn limits capital formation. This, consequently, leads to low labor productivity and incomes and finally back to low savings. Portfolio investment flows have also great potential for direct impact on economic growth of LDCs. Due to increasing attractiveness of yields in emerging markets, portfolio investments have become the fastest growing component of foreign equity flows to LDCs. However, in the long-run there may be a net outflow, which results in the transfer of profits, royalty payments, license fees, etc., and thus could have a negative impact on growth rates of host country (Todaro, 1989; Weiss, 1991).

In LDCs MNCs/TNCs are seen as one of the major sources of technology generation and dissemination. They play important and effective role in the process of technology transfer to LDCs by providing investment, by supplying capital goods or by providing unpackaged technology particularly through licensing.

In China, for instance, FDI has made significant contribution to the transfer of software, managerial and export marketing technology. The transfer of technology has been provided in low, intermediate and even high technology areas through establishment of manufacturing facilities, training, and learning by doing (Chen, Chang & Zhang, 1995). FDI affects domestic companies'

productivity through two different channels. The first is knowledge spillovers. Domestic companies learn how to employ superior technologies already used by multinational companies. The second is an efficiency improvement via structural changes in the market. The entry of multinational companies will cause more competition in the host country, which may induce domestic companies to operate more efficiently. The literature shows that market competition is positively correlated with productivity (Nickell, 1996).

FDI in the manufacturing sector is particularly favored as it is often regarded as an amalgamation of capital, technology, as well as managerial and marketing skills. Most developing countries lack technology capability and FDI can serve to facilitate technology transfer and reduce the technology gap between developing countries and industrial countries. In fact, it is suggested that spillovers or the external effects from FDI are the most significant channels for the dissemination of modern technology (Blomstrom, 1989). The realization of this and other benefits from FDI has prompted governments to allow and encourage FDI inflow as evident by the increasing flows of direct investment across national borders over the past few decades. Attracting foreign direct investment has become an important policy element for developing countries to pursue growth and development.

MNCs/TNCs can improve export performance of LDCs by providing access to new markets, requisite inputs, and technology and price competitiveness. When such investment is export-oriented, the impact of MNCs/TNCs on export performance can be assessed at country level, industry

level and company level. MNCs/TNCs in export promotion in LDCs focus heavily in the area of manufactures or non-traditional exports. An empirical study, done on the country level by Santiago (1987) for Puerto Rico, indicates that a 1 percent rise in FDI results in a 7 percent increase in the average share of manufacturing exports.

Even though there has been a lot of argument about the positive effects of FDI, there has been some theoretical disagreement on FDI's potential positive impact on host country's development and many have argued that there are possible disadvantages of FDI that could harm host country. For example, the most common manifestation of foreign investment (FDI) is through transnational corporations (TNCs) or multinational national enterprises (MNEs). Since they are global profit-seeking organizations which have their own objectives and strategies, and the political support of the advanced countries, their main objective is to maximize their return on capital. For this purpose, they seek out the best profit opportunities in a wide range of activities in host countries and they deal rarely with issues, such as poverty, inequality, and unemployment alleviation. According to Fry (1993) and Agosin and Mayer, (2005), foreign firms are usually characterized by technological superiority and it is likely that they are able to exploit more rapidly and effectively possible opportunities which primarily were open to domestic investors.

Moreover, it is argued that TNCs/MNEs may perpetuate technological dependence by transferring costly, inappropriate and capital-intensive technology to LDCs and the reaction of TNCs/MNEs to the development of an indigenous

Research and Development (R&D) expenditure is almost negative. In most LDCs native technological capacity is not an alternative to the successful transfer of technology. The factors such as substantial inflows of foreign technology, a rapid development of native technologies abilities, and investment in education and training, could help successful accumulation of technology.

Foreign investment has a major impact on the balance of payments (BOP) of host countries. The impact of FDI on the BOP of host countries can be both direct and indirect. The direct effects include imports of funds and exports as benefits; imports of capital goods and raw materials, exports of profits, and interest and technological payments as costs. Indirect effects of FDI cover the final BOP impact of local sales and the use of local capital.

However, FDI in an economy with highly distorted policies is likely to generate net losses for the host country rather than welfare gains. A study done by Lall (1985) showed that the net direct BOP effects of FDI in selected LDCs, with the exemption of specifically export-oriented ones, were negative. About 91percent of 159 foreign firms affected the BOP negatively in these countries. In the long-term there may be a net loss of foreign exchange earnings from LDCs leading to unsustainable BOP positions. This is because in the short-term there is only one-time injection of foreign exchange into LDCs, while in the long-term a steady stream of profits, royalty payments, as well as license fees will flow out from LDCs. In the long-term foreign direct investments may create some problems. Such flows may be varying from year to year, injecting a greater volatility into host country's BOP. In addition, sudden inflows may be

inflationary. However, it is highly difficult to the long-term effects of FDI on BOP due to the phenomenon of transfer pricing, (Moran, 1985).

In addition, it has been estimated in the Mexican economy that in 1974, about 34.1 percent of manufactured exports were made by foreign firms. However, the contribution of foreign firms in terms of exchange earnings (12.6 percent) was lower than that of locally-owned firms (19.4 percent) in 1974 (see Jerkins, 1979). Export oriented investment of MNCs/TNCs in East Asian countries has enabled them to increase their exports significantly. For instance, in China the share of FDI in total exports reached to 20 percent and 30 percent in 1992 and 1993, respectively, (see Chen *et al.*, 1995). It is argued that the contribution of TNCs/MNEs to export and national income growth depends on the development level of countries. Their overall impact is likely to be greater for middle and high income countries than for countries at early stage of their development. The performance of MNCs/TNCs is found to be mixed in export manufactures when compared with that of local firms in developing countries (Ahiaktar, 1990; Weiss, 1991).

Lall (1985) points out that a number of developing countries have not obtained sufficient export earnings through MNCs/TNCs. The reason for this fact may be given as follows: wrong location, insufficient requisite materials and skills, as well as inadequate infrastructure in these countries. Thus, all these factors lead to very high cost and instability for TNCs to commit themselves to world-wide sourcing from them.

The impact of TNCs on employment can be observed directly, indirectly and qualitatively. World Investment Report (WIR, 1992) shows that only about 7 million people were employed by MNCs/TNCs in LDCs in the mid-1980s, which is just equal to 1 percent of economically active population of LDCs. The share of TNCs in employment was seen significantly in export processing zones (EPZs) where nearly 2 million workers were employed in both traditional labor intensive manufacturing. TNCs can create large indirect employment by providing backward and forward linkages and by influencing employment in competing firms. However, there is no certain evidence regarding the indirect employment effects of TNCs, (TNCs in World Development, 1988).

MNCs/TNCs may bring more efficient technical and managerial skills and may pay higher wages than domestic firms, but they create a small labor elite for themselves whilst transferring the bulk of the workers into the rank of unemployed, (Moran, 1985). They promote capital-intensive technology but most LDCs need labor-intensive technologies to create employment opportunities for their increasing population.

In addition, TNCs may create a dualism in the labor market. If they pay in local labor too low a wage in relation to its contribution to production, they may exploit host country's resource. If they pay higher wages than local firms, they may accelerate the gap between their own labor force and the rest of local labor force. On the other hand, MNCs/TNCs can assist human resource development by introducing new technology and training, particularly their employees in requisite

skills. However, these skills may be only MNCs/TNCs specific and not applicable for local firms.

In LDCs, MNCs/TNCs operate especially environmentally sensitive areas such as mining, petroleum extraction, chemical processing, refining of heavy metals, wood and paper processing and motor vehicles. The process and products of TNCs in these areas may have a potential danger on both human health and environment. As a consequence, the role of TNCs in environmental matter became a subject of global concern. In addition, due to TNC activities nearly 25 percent of Central America's rain forest has turned to grass. However, TNCs have access to both resources and environmental-friendly technology, and also have a global image to protect environment (World Investment Report, 1992). LDCs can put pressure on TNCs for the transfer of such technology. It is argued that the production of TNCs is appropriate for the needs of local elite rather than ordinary people. They may also encourage inappropriate consumption patterns through advertising and through their monopolistic market power (Todaro, 1989; 1994). In addition, TNCs may influence the public opinion and may interfere with elections in the interest of foreign power or ideology; they may destroy domestic culture and traditions by introducing new and cheap goods.

Although the arguments both for and against FDI are still far from being settled empirically. FDI can be an important stimulus to economic and social development as long as the interests of MNCs/TNCs and host county governments coincide. Indeed, today many LDCs desire to get benefit from FDI. Real contribution of MNCs/TNCs depends on the structure of the industry, the

design of host government policies, and the evolution of the foreign investor-host country relationship. However, sometimes strong controls are necessary for TNC activities due to their oligopolistic powers and the ability to transfer profits undetected. In addition, it may be possible to improve the bargaining power of LDCs by means of collecting information, international cooperation of countries from which MNCs/TNCs originates.

Empirical literature review

The impact of capital inflows on economic growth have been the focus of attention of many researches and policymakers. Under conventional expectations, foreign capital inflows bring positive effects to the host country in terms of new investible funds, augmenting domestic savings and foreign exchange earnings.

Empirical studies on the relationship between foreign capital inflows and economic growth have produced diverse conclusions. The empirical identification of externality effects from FDI in host economies is far from straightforward. Empirical evidence from productivity studies supports both the opinions that foreign firms create positive and negative externalities. Similarly contrasting findings can be found in cross country and panel estimates of the relation between FDI and economic growth (Caves, 1996 and De Mello, 1999). In fact, in reviewing the empirical evidence on the impact of FDI on development patterns of host economies, Caves concludes that 'the relationship between a stock of foreign investment and its [the host economy's] subsequent economic growth is a matter on which we totally lack trustworthy conclusions' (Caves, 1996).

Bosworth and Collins (1999) evaluated the implications of capital inflows in the form of FDI, portfolio investment and bank loans for 58 developing countries during the period 1978-1995, they used regression analysis on panel data and examined the impact of capital inflows, as a total and separately as percentages of GDP, on investment and saving, measured also as percentages of GDP. Their results indicated that total capital inflows had a positive impact on investment, while they had an insignificant negative impact on the saving rate. When the capital inflows were separated into the three types, the results indicated that FDI had the strongest positive relationship with investment.

Furthermore, empirical research is hampered by the fact that the line of causation between the two variables is difficult, if not impossible, to predict *a priori*. The prediction that FDI enhances a host economy's level of economic growth can easily be replaced by the alternative prediction that a country's growth level influences the level of inward foreign investment (De Mello, 1999).

In response to these different views, some of the studies test for the relationship between FDI and economic growth while some are to find out the causality between the two variables. These findings vary from different method used. For example is Balasubramanyam, Salisu and Sapford (1996) analysis on how FDI affects economic growth in developing economies. Using cross-sectional data and OLS regressions they found that FDI has a positive impact on economic growth in host countries using an export promoting strategy but not in countries using an import substitution strategy.

Otepola (2002) examines the importance of foreign direct investment in Nigeria. The study empirically examined the impact of FDI on growth. He concluded that FDI contributes significantly to growth especially through exports.

Olofsdotter (1998) provides a similar analysis. Using cross sectional data she found that an increase in the stock of FDI is positively related to growth and that the impact is stronger for host countries with a higher level of institutional capability as measured by the degree of property rights protection and bureaucratic efficiency in the host country.

Mun, Lin, and Man (2008), using OLS and time series data for the period 1970 to 2009 from the IMF and IFS tables on FDI and economic growth in Malaysia, found that there are significant relationships between economic growth and foreign direct investment inflows in Malaysia. Their study confirmed the conventional view that economic development of a country can be achieved by encouraging more foreign capital through FDI. They also showed a negative impact on domestic producers since they lose market power because foreign firms become monopolists due to their superior technologies.

Similarly, Marwah and Tavakoli (2004) examined the impact of FDI on economic growth in Indonesia, Malaysia, Philippines, and Thailand. Using time series annual data over the period 1970-1998, they found that FDI had positive correlation with economic growth for all four countries.

Using a VAR system with ECM, Tang, Selvanathan and Selvanathan (2008) found the following: FDI played an important role in complementing domestic investment in China, the larger the FDI the greater the domestic

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investment. Further, FDI had a significant impact on China's economic growth. China's domestic investment (DI) and economic growth are positively correlated; great economic growth spurs large domestic investment, and vice versa. China's domestic investment and GDP do not have much impact on FDI inflows in the long run. The causal link between GDP and DI is bi-directional, but there is only a one-way directional causality from FDI to DI and FDI to GDP. China's domestic investment had a greater impact on growth than FDI does. These lend some support to the theoretical view that FDI have complementary effects on domestic investment, and that long-term economic growth is positively associated with FDI.

Technology spillovers from FDI have also been widely discussed in the literature and its impact has been identified as an important benefit accruing to domestic firms. It is also considered an important mechanism through which FDI promotes growth in a host country. A study by (Sharma & Abekah, 2008) found that FDI had a positive impact on the growth of GDP in African countries. Another study by (Lee & Tcha, 2004) on transition economies suggested that Total Factor Productivity (TFP) and Gross Domestic Product (GDP) in those countries grew together with the inflow of FDI and the marginal contribution of FDI to GDP is higher than that of DI. Blalock and Gertler, (2004) found convincing evidence of productivity gains, greater competition, and lower prices among local firms in markets that supply foreign entrants for emerging markets.

Additionally, Vu, Gangnes and Noy (2006) studied sector-specific FDI inflows for both China over the period 1985-2002 and Vietnam over the period

1990-2002. Using an augmented production function specification and regression methodology, they concluded that FDI had positive and direct impact on economic growth as well as an indirect impact through its impact on labor productivity.

Uppenberg and Riess (2004) presented a dilemma regarding FDI and domestic economic growth, which they refer to as the growth-FDI nexus. They stated that "…while a strong positive correlation between inward FDI and economic growth exists…it is not clear whether the causality runs from FDI to growth or vice versa…and growth-enhancing policies in general are more promising than specific support for FDI". They were able to conclude that economic growth in general is a more important determinant of FDI than specific policy strategies attempting to boost FDI. While their study examined Europe, their findings regarding the growth-FDI nexus are vital. They confirmed empirically that domestic economic growth is a key variable in determining factors influencing FDI inflows into a country.

Padilla-Perez (2008) showed that technology transfers from FDI may impact diverse actors of the host region (local firms, universities, research centers, industry associations). FDI is found to have positive impact on economic growth directly (Saggi, 2002) and through its interaction with labor (Vua & Noyb, 2009). Levchenko and Mauro (2008) argued that FDI compared to other forms of financial flows provides better protection against crisis. Bashier and Bataineh (2007) identified FDI increases domestic saving, which is another vehicle for local investment increase.

Likewise, earlier studies by (Caves, 1974) on Australian manufacturing, Globerman (1979) on Canadian manufacturing, and (Blomstrom and Persson, 1983) on Mexican manufacturing industries and three recent studies on Indonesia manufacturing industry (Blomstrom & Sjoholm, 1999); (Sjoholm, 1999); (Takii, 2001) all found supporting evidence of spillover effects from FDI.

Campos and Kinoshita (2002) examined the impact of FDI on growth for the period 1990-1998, for twenty-five Central and Eastern European and former Soviet Union transition economies. In these countries, FDI was pure technology transfer. Their main results indicated that FDI had a significant positive impact on the economic growth of each selected country. These results were consistent with the theory that equates FDI with technology transfers that benefit the host country.

Besides that, Borensztein, De Gregorio and Lee (1998) examined the impact of foreign direct investment (FDI) on economic growth in a cross country regression framework, utilizing data on FDI flows from industrial countries to 69 developing countries over the last two decades. Their outcome of the study was that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, the higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. Thus, FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy.

Investment in human resources contributes to the enlargement of productive capacity by improving the quality of the labor force. It is hardly necessary to underline the significance for growth and development of a healthy, educated and trained labor force. It is thus expected that spending on social activities (school, hospital, training ect.), would have a positive impact on development, although the effects may be most apparent in the relatively long term. Indeed, in the short run, it is possible that social spending may reveal a negative relation to growth. If resources are not being used to build schools and hospitals etc, this expenditure would not be contributing to growth in the short term.

However, this is not the case in Liberia. Expenditure on military activities was paramount as evidenced by the almost two decade of civil unrest, and according to (Smith & Wahba, 1995), many developing countries military expenditure has risen rapidly during the past two decades with total military expenditures by developing countries accounting for 21 percent of world military expenditures. This high opportunity cost of military spending through the diversion of scarce resources from productive civilian uses is bound to have an unfavorable impact on the labor force in the long run.

Additionally, work by Bengoa and Sanchez (2003) estimated the relationship between FDI and economic growth using panel data for eighteen Latin American countries over the period 1970-1999. They showed that FDI had positive and significant impact on economic growth in the host countries. However, as in most other papers, Bengoa and Sanchez (2003) found that the

benefit to the host country requires adequate human capital, political and economic stability and liberalized market environment.

Similarly, a work by Schmidt (2008) that studied the relationships between FDI, growth, and cross-country income convergence in 128 countries over three ten-year periods spanning 1970 to 1999 using a non-linear growth regression model that distinguishes the macroeconomic experience of each country individually showed that a country must receive a minimum amount of FDI at least 18 times per capital GDP before its macroeconomic growth rate responds.

According to a more recent study by Esso (2010) who re-examined the relationship between FDI and economic growth in the case of ten Sub-Saharan African countries. Using two forms of econometric approaches, the Pesaran, Smith and Shin, (2001) approach to cointegration and the procedure for non-causality test of Toda and Yamamoto (1995), with data from the 2008 World Investment Report dataset of the UNCTAD, the African Development Bank (2008) and the World Bank (2008) from 1970 to 2007 showed that there is a positive long-run relationship between foreign direct investment and economic growth in six countries. However, foreign direct investment significantly causes economic growth in three countries, while growth causes foreign direct investment in two countries.

A study by Karim and Yosup (2009) examined the causal relationship between foreign direct investment and economic growth using a methodology based on the Toda-Yamamoto test for causality relationship and the bounds

testing (ARDL) and Time-series data for the period 1970- 2005, found that in the case of Malaysia there is no strong evidence of a bi-directional causality and long-run relationship between FDI and economic growth. Their study suggested that FDI had indirect impact on economic growth in Malaysia.

A work on the determinants of FDI in Malaysia from 1970-2008 by Shahrudin, Yusof and Satar (2009), using an autoregressive distributed lag (ARDL) framework and the bound testing for a restricted model where the causality and dynamic relationship between FDI and its key determinants were identified, revealed that financial development and economic growth contribute positively to the inflow of FDI in Malaysia.

The results of FDI and GDP however, have been mixed. Some studies found evidence supporting the theoretical prediction on the existence of spillover impact from FDI. A good example of the range of possible relations between FDI and growth is offered by Zhang (2001). Exploring the existence of bi-directional causation between FDI and growth for a sample of eleven Latin American and East Asian countries for a 30-year period, Zhang found a positive long run relation running from FDI to economic growth for five countries. For the other six countries, there is mixed evidence of this line of causation in the short run. Also, for some countries the line of causation runs from economic growth to FDI as well.

Duasa (2007), examined the causality between FDI and output growth in Malaysia, the study found no strong evidence of causal relationship between FDI and economic growth. This indicated that, in the case of Malaysia FDI does not

cause economic growth, vice versa, but FDI did contribute to stability of growth as growth contributes to stability of FDI.

Ericsson and Irandoust (2001) examined the causal effects between FDI growth and output growth for the four OECD countries applying a multi-country framework to data from Denmark, Finland, Norway and Sweden. The authors failed to detect any causal relationship between FDI and output growth for Denmark and Finland. They suggested that the specific dynamics and nature of FDI entering these countries could be responsible for these no-causality results.

Another example is De Mello (1999), who estimated the impact of FDI in a sample of OECD member and non-member countries for the period 1970-1990. His estimations did not identify a long run relation between FDI and economic growth among the OECD member countries. As for the non-member countries, the estimations indicated that a long run relation existed in some countries, but not in others. Important to note here as well are that his findings also showed that negative associations existed between FDI and economic growth in some countries.

Adelegan (2000) explored the SURE model to examine the impact of FDI on economic growth in Nigeria and found out that FDI is pro-consumption and pro-import and is negatively related to gross domestic investment. The study focused on the impact of FDI in extractive industry (oil and natural resources) on Nigeria's economic growth.

Ayanwale (2007) examined the relationship between non-extractive FDI and economic growth in Nigeria. Using secondary data sourced from the Central

Bank of Nigeria, IMF and the Federal Office of Statistics for the period 1970–2002 and augmented growths model via the ordinary least squares and the 2SLS method found that FDI in Nigeria contributed positively to economic growth. But the overall impact of FDI on economic growth may not be significant.

Applying the rho's rank correlation and causality test in exploring the possible links between FDI and economic growth, Ayadi, (2009) found that FDI have not contributed significantly to output growth in Nigeria. The efficacy of FDI in generating the desired growth may be limited by the level of infrastructural development. However, FDI is found to exert some level of influence on exports of goods and services. The study also found that human capital is an important factor in FDI-growth debate in Nigeria. The implication of this is that if sufficient investment can be put into high levels of human capital, the technological spillovers associated with FDI could be achieved.

Falki (2009) using Engle and Granger (1987) co-integration techniques and OLS method to estimate the impact of FDI on economic growth in Pakistan for the period 1980-2006 with data on variables from the Handbook of Pakistan Economy - 2005 and the World Bank Development Indicators - 2008 CD-ROM found that FDI had a negative and insignificant impact on economic growth as compared to domestic capital and labor that contributed positively to economic growth.

Chakraborty and Basu (2002) utilized the technique of cointegration and error- correction modeling to examine the link between FDI and economic growth

in India. The results suggested that GDP in India is not Granger caused by FDI, and the causality runs more from GDP to FDI.

According to the findings of Choe (2003), causality between economic growth and FDI ran in either direction but with a tendency towards growth causing FDI; there was little evidence that FDI causes host country growth. Rapid economic growth could result in an increase in FDI inflows. Also, using data from 10 East Asian economies, Kholdy (1995) carries out Granger causality tests but did not find causation between FDI and Productivity.

Arthukorala (2003), using annual time series data from the Central Bank of Sri Lanka on GDP, FDI, DI, and Trade Liberalization (TL) for the period 1959-2002 and applying the economic framework of cointegration and error correction mechanism, found that FDI inflows do not exert any independent influence on economic growth. And the direction of causation is from GDP to FDI and not FDI to GDP. Their results also showed that domestic investment and trade liberalization positively impacted GDP and there is a direct independent causality running from DI and TL to GDP as well as from GDP to DI and TL.

Eregha (2011), using data for the period 1970-2008 from UN statistical online database, the WDI 2009 online database and a panel cointegration estimation technique to investigate the dynamic linkages between foreign direct investment and domestic investment in the ECOWAS region, revealed that foreign direct investment inflow substitutes domestic investment in the ECOWAS region, export openness had positive impact while import openness had negative impact on domestic investment accumulation respectively.

Moreover, studies in the line of Carkovic and Levine (2002) do not lend support to studies that identified a positive relationship between FDI and economic growth, but instead suggested that the effects of FDI are contingent on the absorptive capability of the host country. This is confirmed by Xu (2000) who investigated US multinational enterprises as a channel of international technology diffusion in forty countries from 1966 to 1994.

A study by Katerina, John and Athanasios (2004), examined the relationship of FDI and economic growth for selected transition economies. The evidence from the statistical analysis suggested that foreign direct investment (FDI) does not have any significant relationship with economic growth for transition countries. They derived the same conclusions after splitting their sample into low and high income/growth countries. They concluded that FDI does not exert any robust influence on growth.

Lan (2006) examined the relationship between FDI and economic growth in Vietnam by using a simultaneous system of equations for a panel data set of Vietnamese provinces over the period 1996-2003, indicated that FDI and economic growth are important determinant of each other. Thuy (2005) figured out the main channels and estimated the technological spillover effects of FDI using industrial level data for periods 1995-1999 and 2000-2002. The linkage between foreign investors and domestic private sectors is found to play an important role for technological spillovers from FDI in Vietnam.

Another study by Chowdhury and Mavrotas (2006) examined the causal relationship between FDI and economic growth by using time-series data

covering the period 1969-2000 for three developing countries, namely Chile, Malaysia and Thailand. They follow the Toda and Yamamoto causality test approach. Their empirical findings clearly suggested that GDP causes FDI in the case of Chile and not vice versa, while for both Malaysia and Thailand, there is strong evidence of a bi-directional causality between the two variables.

Furthermore, Hanson (2001) has found weak evidence that FDI generates positive spillovers for host countries. Recently, comprehensive discussions at the firm level have been provided by Gorg and Greenaway (2004). Another study by Germidis, (1977) found almost no evidence of technology transfer to local competitors. The lack of spillovers to domestic firms was attributed to a number of factors, including limited hiring of domestic employees in higher level positions, very little labor mobility between domestic firms and foreign subsidiaries, limited subcontracting to local firms, no research and development by the subsidiaries, and few incentives by multinationals to diffuse their knowledge to local competitors.

Moreover, Lipsey and Sjoholm (2004) asserted that for both wages and productivity, the spillovers to domestically owned firms or establishments could be either positive or negative. Wage spillovers could be negative if, for example, the foreign owned firms hired the best workers, at their going leaving only lower-quality workers at the domestically owned firms. Productivity spillovers could be negative if foreign-owned firms took market shares form domestically owned firms, leaving the latter to produce at lower, less economical production levels.

Empirical studies on the determinants of foreign direct investment show two strands of results which are important to Africa. First, the results show that countries in Africa can play major roles in promoting FDI through an appropriate policy framework, and that FDI to Africa is not solely driven by natural resources endowment but also by other factors (Asiedu, 2003). In the short and medium term, countries can increase their FDI by actions which include streamlining their investment regulatory framework, implementing policies which promote macroeconomic stability and improve infrastructure. In the long run, more FDI can be achieved by curbing corruption, developing a more efficient legal framework and reducing political instability (Asiedu, 2006).

Summary

From the literature reviewed so far, it will be ambiguous to assign any positive or negative expectation on the impact of FDI on Economic growth in Liberia. This is due to the fact that the empirical literature is inconclusive as regards a-priori expectation and macroeconomic factors that contribute to FDI inflow were destabilized for a long period during the civil unrest in Liberia. Generalization can therefore be made upon country specific analysis. Furthermore, the study holds that economic growth is greatly enhance by domestic private investment.

METHODOLOGY

Introduction

The chapter seeks to shed light on the methods and techniques to be adopted to arrive at the objective of the study which is to examine the impact of foreign direct investment (FDI) on economic growth in the Liberian economy from 1975 to 2009. It will begin with the specification to be followed by the description of data for the study and the estimation procedures. We develop the empirical work using an endogenous growth model in which the rate of technological progress, capital inputs and labor inputs are the main determinants of long-term economic growth of income (GDP) (Solow, 1956).

Model specification

To analyze the effects of foreign direct investment inflow on output growth, a standard Cobb-Douglas production function is adopted:

$$Y_t = A_t K_t^{\beta_1} L_t^{\beta_2} \tag{5}$$

Where Y_t is output or RGDP, K_t is capital input, L_t is labor input, A_t is the level of technology all at time t. The study follows recent works in the field, Nyatepe-Coo, (1998); Bende-Nabende and Ford, (1998); De Mello, (1999); Bende-Nabende et al., (2003) and Li and Liu, (2005), Narayan and Narayan

(2006), by specifying an extended Cobb-Douglas production function (equation 5) to represent the production technology of an economy. To appreciate the different effects of capital on RGDP, capital is decomposed into domestic private investment (DPI) and foreign direct investment (FDI). Such disaggregation allows for the critical investigation of the role of foreign capital inflow in economic development and permits useful comparative insight among the types of investments as well. Thus, the equation above becomes a stochastic production function as stated below:

$$RGDP = A_t FDI_t^{\beta_{1y}} DPI_t^{\beta_{2y}} LF_t^{\beta_{3y}} XP_t^{\lambda_{1y}} OP_t^{\lambda_{2y}} INFL_t^{\lambda_{3y}} e^{\varepsilon_{ty}} \qquad (6)$$

$$FDI_t = A_t RGDP_t^{\beta_{1f}} DPI_t^{\beta_{2f}} LF_t^{\beta_{3f}} XP_t^{\lambda_{1f}} OP_t^{\lambda_{2f}} INFL^{\lambda_{2f}} e^{\varepsilon_{tf}} \qquad (7)$$

$$DPI_t = A_t RGDP_t^{\beta_{1d}} FDI_t^{\beta_{2d}} LF_t^{\beta_{3d}} XP_t^{\lambda_{1d}} OP_t^{\lambda_{2d}} INFL^{\lambda_{3d}} e^{\varepsilon_{td}} \qquad (8)$$

The Cobb-Douglas function is both homothetic and strongly separable and t is the time dimension. Y denotes the economy's output (RGDP). A, which is the shift parameter in the production function attributed to technical progress is assumed to be risk neutral. (DPI) is domestic private investment, (FDI) is foreign direct investment as a ratio to RGDP and (LF) is labor force. (OP) is imports and imports express over RGDP and (XP) is exports, while INFL is inflation measuring macroeconomic instability (Asiedu, 2006). These are policy variables in equations 6, 7 and 8 respectively. Transforming equations (6, 7, and 8) in its log linear form results in the following econometric regression functions:

$$LnRGDP_t = \alpha_{0y} + \beta_{1y} LnFDI_{ty} + \beta_{2y} LnDPI_{ty} +$$
$$\beta_{3y} LnLF_{ty} + \lambda_{1y} LnEX_{ty} + \lambda_{2y} LnOP_{ty} + \lambda_{3y} INFL + \varepsilon_{ty} \qquad (9)$$

$$LnFDI_t = \alpha_{0f} + \beta_{1f} LnRGDP_{tf} + \beta_{2f} LnDPI_{tf} +$$
$$\beta_{3f} LnLF_{tf} + \lambda_{1f} LnEX_{tf} + \lambda_{2f} LnOP_{tf} + \lambda_{3f} INFL + \varepsilon_{tf} \qquad (10)$$

$$LnDPI_t = \alpha_{0d} + \beta_{1d} LnRGDP_{td} + \beta_{2d} LnFDI_{td} +$$
$$\beta_{3d} LnLF_{td} + \lambda_{1d} LnEX_{td} + \lambda_{2d} LnOP_{td} + \lambda_{3d} INFL + \varepsilon_{td} \qquad (11)$$

Where the coefficients, β_1, β_2, β_3, are the output elasticities of the factor inputs ε_t is the stochastic error term and α_0 is the constant term, λ_i where (i = 1-3) is the coefficient of the policy variables used in the study. The study also includes a dummy variable War with a coefficient θ_{ti} to capture the structural breaks (instability) that existed during the period under consideration. The War variable is a binary variable that takes the value of 0 for no war and 1 otherwise. Thus, equations (9, 10, and 11) now become:

$$LnRGDP_t = \alpha_{0y} + \beta_{1y} LnFDI_{ty} + \beta_{2y} LnDPI_{ty} +$$
$$\beta_{3y} LnLF_{ty} + \lambda_{1y} LnEX_{ty} + \lambda_{1y} LnOP_{ty} + \lambda_{3y} INFL + \theta_{ty} W + \varepsilon_{ty} \qquad (12)$$

$$LnFDI_t = \alpha_{0f} + \beta_{1f} LnRGDP_{tf} + \beta_{2f} LnDPI_{tf} +$$
$$\beta_{3f} LnLF_{tf} + \lambda_{1f} LnEX_{tf} + \lambda_{2f} LnOP_{tf} + \lambda_{3f} INFL + \theta_{tf} W + \varepsilon_{tf} \qquad (13)$$

$$LnDPI_t = \alpha_{0d} + \beta_{1d} LnRGDP_{td} + \beta_{2d} LnFDI_{td} +$$
$$\beta_{3d} LnLF_{td} + \lambda_{1d} LnEX_{td} + \lambda_{2d} LnOP_{td} + \lambda_{3d} INFL + \theta_{td} W + \varepsilon_{td} \qquad (14)$$

Justification of variables

Economic Growth

Economic Growth refers to the steady growth in the productive capacity of the economy overtime. Following previous works, (Esso, 2010), (Falki, 2009) Real GDP is used as the proxy to capture output growth. It is the gross aggregate

of consumption, investment and government expenditure produced in and economy and measured in current foreign currency divided.

Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI), a form of capital inflow has emerged as the most important source of external resource to developing countries over the years and has become a significant part of capital formation in these countries. It is defined as investment made by foreign firms or individuals (often involves stock ownership of 10 percent and above of a business) in the home country. The role of foreign direct investment (FDI) has been widely recognized as a growth-enhancing factor in developing countries (Khan, 2007). The effects of FDI in the host economy are, normally believed to be, increase in employment, augmentation in productivity, boost in exports, introduces modern techniques of management and marketing skills, and eases the access to new technologies.

The study uses FDI as a share of RGDP, (Asiedu, 2006), (Esso, 2010) as a measure of foreign direct investment. Though the general perception of FDI on host country is expected to have a positive impact on growth and productivity, the vast literature has proven otherwise with inconclusive generalization. Base on the different result of FDI on economic growth, Ajayi, (1999), Carkovic and Levine (2002), De Mello (1999), Lall, (1985), Ayadi, (2009) a priori expectation for FDI cannot be established.

Domestic Investment

Capital, as has been stated above consists of both foreign and domestic components. Since a reliable data series for capital stock is not available for Liberia, the study incorporates gross fixed domestic investment as a share of RGDP to proxy for domestic private investment, Barro (1997), Arthukorala, (2003), Eregha, (2011), Kumar and Pradhan, (2002)

Domestic private investment is a variable thought to contribute to the amount of FDI a country attracts. If host country banks are investing heavily in domestic economic ventures, it is safe to assume that there are many profitable businesses fulfilling local demand. High levels of domestic investment indicate that individuals are opening new businesses and investing in their businesses.

According to Shahabadie and Mahmudie, (2007), a high-quality domestic business environment should have an impact on the amount of FDI that flows into the country. Also, when foreign businesses look to invest abroad, they undeniably inspect how economic growth is in the country. Economic growth is an indicator which ensures that domestic businesses in the country are doing well, and is a place businessmen may invest or start a business.

Labor Force

For the labor input in this study, labor force which constitutes that portion of the population aged 15 years and above, productive and is expected to have a positive impact on growth is considered as an appropriate measure of labor input. The reason for choosing this variable is its authenticity in empirical literature on

growth (Jayaraman & Singh, 2007) as there can be no growth achievement without the involvement of labor as a factor input. Its a priori expected sign is positive.

Exports (XP)

An elaborate strand in the literature focuses on whether multinationals spread their knowledge of global market to domestic firms, thus enabling them to become more successful exporters. Domestic firms can be affected through three major channels. First, if multinationals have better access to information about foreign market, this can spill over through their export activities. Second, domestic firms can learn the multinationals' superior production or management techniques through the demonstrative effects or observation, enabling the domestic firm to compete more successfully in export markets and thirdly, competition with multinational firms at home and in foreign market can induce domestic firms to improve their export performance (Gorg and Greenway, 2004). And lastly, imitation is the transmission mechanism for new products and process. Das (1987) and Wang and Blomstrom (1992), alluded technology transfer from developed to developing economies through the process of imitation. Thus, a priori expect sign for exports is positive.

Openness of the host economy to trade

The ratio of trade (imports and exports) to GDP as is standard in the literature (Asiedu, 2006) and (Ayanwale, 2007) is used to capture openness of a

host country. The concept of openness suggests that economies benefit from international trade, international capital transactions, and the international exchange of knowledge and information. If the barriers to international transactions are lower, the higher the level of integration and the benefits. The openness argument is based on two theoretical pillars: classical trade theory and "new" trade theory. Classical trade theory predicts static gains from trade if countries produce and exchange goods according to their comparative advantages. New trade theory predicts dynamic gains, i.e. more openness leads not only to a one-time increase of the level of income, but higher growth rates.

Contrary to the rather restrictive assumptions of the classical model, the assumptions of new trade theory are much more realistic. New trade theory takes into account imperfect competition, increasing returns to scale, and changing technology (Romer, 1986). According to new trade theory the impact of openness on FDI works through different channels. In an open economy enterprises face competition and have larger markets which bring down prices and costs through market-enforced discipline and economies of scale. Trade and contact with foreign enterprises provide access to knowledge of new product and production styles, either through technology embodied in imports or through foreign direct investment. A priori expectation is positive.

Macroeconomic instability (inflation)

A standard in the literature, macroeconomic stability is a key factor in determining the inflow of FDI in a country. As a measure of macroeconomic

instability, inflation is used as an indicator to capture macroeconomic instability, since a high level of inflation is associated with reduce FDI inflow (Asiedu & Lien, 2004) and Asiedu, (2006).

Dummy Variable (War)

War as a dummy variable is included to capture the structural breaks that existed during the period under consideration. It is a binary variable which takes the value of zero (0) for no war and one (1) in periods of war in the country. This variable is expected to have a negative impact on GDP growth.

Data sources

The study relies on secondary data. The data are obtained from the following relevant institutions: International Financial Statistics 2009 CD ROM, World Bank, World Development Indicators, WDI online database, Central Bank of Liberia, CBL and the Liberian Geo and Information Services, LIGIS. It considers a sample period of 35 annual observations for each variable ranging from 1975 to 2009 inclusive.

Estimation procedures

Unit root test

The first step of the estimation process begins with examining the time series properties of the data series. The pattern and trend in the data are examined and the tests for stationarity and the order of integration are also considered. As

with the case of secondary time series data they are mostly non-stationary (integrated) at their levels. And ignoring this may lead to spurious regression results. In general terms, we specify economic models based on the assumption that the variables are stationary. After the model has been specified, the variables are then tested for unit root (stationarity) using the Augmented Dickey-Fuller (ADF) tests. Consequently, the first test to be conducted is to ascertain whether the variables are stationary or test the level of integration through the unit root tests. The simplest case of this comes from a random walk variable. This is a variable that assumes the same values as in the last period, modified by current shocks.

$$y_t = y_{t-1} + \varepsilon_t \qquad (15)$$

ε_t are shocks to the system and are assumed to be white noise process.

In general, we write (15) as:

$$y_t = \alpha y_{t-1} + \varepsilon_t \qquad (16)$$

So that if $\alpha = 1$, it is a pure random walk variable. This is not a necessary requirement to have a random walk variable but we want the example to remain simple and tractable. The assumption that $\alpha = 1$, implies that y_t is an integrated process so that subtracting y_{t-1} from both sides of equation (16), yields:

$$\Delta y_t = y_t - y_{t-1} + \varepsilon_t \qquad (17)$$

That is we difference y_t. Now Δy_t is stationary. The error term is assumed to be a shock process, which is stochastic and can thus be regarded as a white noise process such that;

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$$\left[\varepsilon_t = 0, Var(\varepsilon_t - \varepsilon_{t-1}) = E(\varepsilon_t^2) = \delta^2 \varepsilon_t\right].$$

Primarily, due to the spurious nature of regression results generated by non stationary variables, the ADF test is done to examine the stationary properties of the variables. The test for unit root is thus formulated as follows (Dickey-Fuller, DF Test) and is based on the estimation of:

$$\Delta y_t = \rho y_{t-1} + \varepsilon_t \tag{18}$$

Thus $\alpha = (1+\rho)$ or $\alpha -1= \rho$, hence, if $\rho < 0$, then in (19), $\alpha < 1$. The Dickey-Fuller test consists of testing the negativity of ρ of the OLS regression in (18). That is we test the following null hypothesis:

$H_o : \rho = 0$, which implies that $\alpha = 1$ or α-1=0 (non-stationary)

$H_a : \rho < 0$, which implies that $\alpha - 1 < \rho < 0$, $\alpha < 1$ (stationary)

The following equations are used in accepting or rejecting the null hypothesis;

$$\Delta y_t = \rho y_{t-1} + \varepsilon_t \tag{18}$$

$$\Delta y_t = \alpha_0 + \rho y_{t-1} + \varepsilon_t \tag{19}$$

$$\Delta y_t = \alpha_0 + \rho y_{t-1} + \alpha_1(t - t_m) + \varepsilon_t \tag{20}$$

Where ρ is the values generated from the ADF test. Equation (18) has no drift, (19) has a drift and (20) has a drift and a stationary trend process. This is time trend subtracted from its mean (t_m). These three equations are supposed to give a value of ρ and it becomes more efficient as you move form (18) to (20). The equation for our ADF test can be stated as:

$$\Delta X_t = \alpha + \delta t + \rho X_{t-1} + \sum_{i=1}^{p} \lambda_i \Delta X_{t-1} + e_{1t} \tag{21}$$

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Where X_t denotes the series at time t, Δ is the first difference operator, α, δ, ρ and λ are parameters to be estimated and e is the stochastic random disturbance term. Thus, the ADF test of the null hypothesis that a series contains unit root or is non-stationary against the alternative hypothesis of no unit root stationary can be stated as: $H_0 : \rho = 0$ and the alternative is $H_1 : \rho \neq 0$

If the tau value is more negative than the critical values (or greater in absolute terms), we reject the null hypothesis and conclude that the series is stationary. Conversely, if the tau statistic is less negative than the critical values (or smaller in absolute terms), we fail to reject the null hypothesis and conclude that the series is non-stationary.

The ADF test is a test against the null hypothesis that there is a unit root of I(1) in the series. The augmentation involves the inclusion of lags of Δy_t and thus improves the statistical fit of the equation and ρ is more efficient now with the added information. The ADF test is used in this study to determine the order of integration of the variables. The use of the ADF is to prevent the possibility of a higher order autocorrelation in the error terms associated with the Dickey-Fuller (DF) Test, (Dickey & Fuller, 1979).

If the variables are not stationary, they would tend to correlate highly when a linear technique such as when (OLS) regression is applied. For data of such series the value of any given data would be determined largely by the value of the preceding data in the series. This autocorrelation must be controlled before inferences may be made about the correlation with other variables. Failure to control this would lead to spurious results. In spurious regression, the results

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suggest that there are statistically significant relationships among the variables of the model but the results cannot be used for any meaningful analysis or inferences.

Enders (2005) mentioned that the selection of an appropriate lag length is as important as determining which variables to be included in a VAR system. Though one possible means of achieving this is to allow for different lag length for all equations, it is common to use the same lag length for all equations since this preserves the symmetry of the system. One of the main challenges of the VAR, however, is to choose the optimal lag length, p. If p is too small, then the model may be mis-specified due to omission of relevant variables; if p is too large, the degrees of freedom are wasted. In other words, a model with a relatively large number of lags is most likely to produce residuals that approach a white noise process but might not be parsimonious.

On the other hand, a model with small value of the lag length is more likely to be parsimonious but might not produce residuals that are random enough to approach a white noise process. The above problem implies that there is the need to select an optimal lag length p^* for the VAR. The F-statistics approach to selecting the optimal lag length is considered inappropriate for this study on the basis that it is tedious to use and as well has the tendency to produce too large a model, at least some of the time (Stock & Watson, 2003). The study employs the information-based criteria for selection the optimal lag length for the model. These have the advantage of selecting an optimal lag length that ensures a

parsimonious model, while at the same time ensuring that the errors approach a white noise process.

Both the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) or Schwarz Information Criterion (SIC) have the common objective of selecting a model that produces errors that approach a white noise process as much as possible, subject to the constraint that the smallest possible number of lag terms or estimated parameters is included to ensure parsimony as well. When this objective is achieved, the number of lags that minimizes the BIC is consistent estimator of the true lag length. On the other hand, the constraint in the AIC formula is not large enough to ensure that the correct lag length is chosen, even in large samples so that the AIC estimator of the true optimal lag length is not consistent.

Nevertheless, as suggested by Stock and Watson (2003), AIC provide a reasonable alternative to BIC if one is concerned that the BIC might yield a model with too few lags. Based on this, the study will use the two criteria to select a value for the optimal lag length p^*. Because time series is autocorrelated, the ADF test is usually used to take into account the white noise process based on the introduction of the lagged difference term. If the t-statistics from the stationary equation is greater than the critical values, we reject the assumption of non-stationarity (unit root) and otherwise.

Similarly, the study also apply the Phillips-Perron test of unit root as the ADF tests are unable to discriminate well between non-stationary and stationary series with a high degree of autocorrelation. The PP test has an advantage over the

ADF test as it gives robust estimates when the series has serial correlation and time-dependent heteroscedasticity. For the PP test, we estimate the equation as below:

$$\Delta X_t = \alpha + \pi_{2x_{t-1}} + \varphi\left(t - \frac{T}{2}\right) + \sum_{i=1}^{m} \varphi_i \Delta X_{t-1} + e_{2t} \qquad (22)$$

ARDL (Bounds test) approach to cointegration

Econometric literature provides different methodological procedures to empirically examine the long-run relationship and dynamic interactions between two or more time-series variables. The most widely used methods include the two-step procedure of Engle and Granger (1987) and the full information maximum likelihood-based approach of Johansen (1988) and Johansen and Juselius (1990). All these methods require that the variables under investigation be integrated of order one. This inevitably involves a step of stationarity pre-testing, thus introducing a certain degree of uncertainty into the analysis. In addition, these tests suffer from low power and do not have good small sample properties (Cheung & Lai, 1993; Harris, 1995). Due to these problems, we make use of a newly developed approach to co-integration that has become popular in recent years.

The Autoregressive Distributed Lag (ARDL) or Bound Test approach to co-integration developed by Pesaran and Shin (1999) and further extended by Pesaran et. al, (2001) is adopted for this study. The procedure is adopted for the following three reasons. Firstly, the bounds test procedure is simple. As opposed to other multivariate co-integration techniques such as Johansen and Juselius (1990), it allows the co-integration relationship to be estimated by OLS once the

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lag order of the model is identified. Secondly, the bounds testing procedure does not require the pre-testing of the variables included in the model for unit roots unlike other techniques such as the Johansen approach. It is applicable irrespective of whether the regressors in the model are purely I(0), purely I(1) or mutually co-integrated. Thirdly, the test is relatively more efficient in small or finite sample data sizes. Estimates derived from Johansen-Juselius method of co-integration are not robust when subjected to small sample sizes as compared to bounds test. Another advantage of the ARDL is that one can include dummy variable in the co-integration test process. With these reasons specified the adoption of the ARDL model for this study is justified.

The bound testing procedure

The study proceeds to estimate the short run and long run elasticities by following the Unrestricted Error Correction Model (UECM) which is unrestricted intercepts and no trends based on the assumption made by Pesaran et. al (2001). From the analysis, equations (12, 13 and 14) can be expressed in ARDL representation as:

$$\Delta LRGDP_t = \alpha_{0y} + \sum_{i=1}^{n} \beta_{1y} \Delta LRGDP_{t-i} + \sum_{i=1}^{n} \beta_{2y} \Delta LFDI_{t-i} + \sum_{i=1}^{n} \beta_{3y} \Delta LDPI_{t-i} + \sum_{i=1}^{n} \beta_{4y} \Delta LLF_{t-i}$$

$$+ \sum_{i=1}^{n} \beta_{5y} \Delta LEX_{t-i} + \sum_{i=1}^{n} \beta_{6y} \Delta LOP_{t-i} + \sum_{i=1}^{n} \beta_{7y} \Delta INFL_{t-i} + \delta_{1y} LRGDP_{t-1} + \delta_{2y} LFDI_{t-1} + \delta_{3y} LDPI_{t-1}$$

$$+ \delta_{4y} LWF_{t-1} + \delta_{5y} LEX_{t-i} + \delta_{6y} LOP_{t-i} + \delta_{7y} INFL_{t-i} + \theta_y W + \varepsilon_{ty} \qquad (23)$$

$$\Delta LFDI_t = \alpha_{0f} + \sum_{i=1}^{n} \beta_{1f} \Delta LFDI_{t-i} + \sum_{i=1}^{n} \beta_{2f} \Delta LRGDP_{t-i} + \sum_{i=1}^{n} \beta_{3f} \Delta LDPI_{t-i} + \sum_{i=1}^{n} \beta_{4f} \Delta LLF_{t-i} +$$

$$\sum_{i=1}^{n} \beta_{5f} \Delta LXP_{t-i} + \sum_{i=1}^{n} \beta_{6f} \Delta LOP_{t-i} + \sum_{i=1}^{n} \beta_{7f} \Delta INFL_{t-i} + \delta_{1f} LFDI_{t-1} + \delta_{2f} LRGDP_{t-1} + \delta_{3f} LDPI_{t-1} +$$

$$\delta_{4f} LLF_{t-1} + \delta_{5f} LXP_{t-i} + \delta_{6f} LOP_{t-i} + \delta_{7f} INFL_{t-i} + \theta_f W + \varepsilon_{tf} \qquad (24)$$

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$$\Delta LDPI_t = \alpha_{0d} + \sum_{i=1}^{n}\beta_{1d}\Delta LDPI_{t-i} + \sum_{i=1}^{n}\beta_{2d}\Delta LRGDP_{t-i} + \sum_{i=1}^{n}\beta_{3d}\Delta LFDI_{t-i} + \sum_{i=1}^{n}\beta_{4d}\Delta LLF_{t-i} +$$

$$\sum_{i=1}^{n}\beta_{5d}\Delta LXP_{t-i} + \sum_{i=1}^{n}\beta_{6d}\Delta LOP_{t-i} + \sum_{i=1}^{n}\beta_{Fd}\Delta INFL_{t-i} + \delta_{1d}LDPI_{t-1} + \delta_{2d}LRGDP_{t-1} + \delta_{3d}LFDI_{t-1} +$$

$$\delta_{4d}LLF_{t-1} + \delta_{5d}LXP_{t-i} + \delta_{6d}LOP_{t-i} + \delta_{7d}INFL_{t-i} + \theta_{2d}W + \varepsilon_{td} \tag{25}$$

Where Δ is the difference operator, n is the lag length and ε_{it} are the uncorrelated errors which $\sim N\,(0,\,\delta^2)$. From above, formulation of the null hypothesis (of no co-integration) against the alternative hypothesis (there is co-integration) between all variables by using Wald-coefficient or F-test with the respective critical values. The terms $\left(\Delta LRGDP_t, \Delta LFDI_t \, and \, \Delta LDPI_t\right)$ are the difference of the logs of the series under consideration. ΔLLF_t is the difference of the log of the labor force. $\alpha_{0y}, \alpha_{0f}, \alpha_{0d}$ are the intercept terms of the individual series and β_{iy}, β_{if}, β_{id} where (i=1-6) are the coefficients measuring the short run relationship and $\delta_{iy}, \delta_{if}, \delta_{id}$ are the coefficients measuring the long run relationship.

The null hypothesis for no co-integration among the variables in equation (23) when $\Delta LRGDP_t$ is the dependent variable can be stated as:

H_0: $\delta_{1ty}, = \delta_{2ty}, = \delta_{3ty} = \delta_{4ty} = \delta_{4ty} = \delta_{5ty} = \delta_{6ty} = \delta_{7ty} = 0$ and the alternative is stated as: Ha: $\delta_{1ty}, \neq \delta_{2ty}, \neq \delta_{3ty} \neq \delta_{4ty} \neq \delta_{5ty} \neq \delta_{6ty} \neq \delta_{7ty} \neq 0$. Also, the specification of the null hypothesis of no cointegration when $\Delta LFDI_t$ in (24) is the dependent variable can be stated as:

Ho: $\delta_{1f}, = \delta_{2f}, = \delta_{3f} = \delta_{4f} = \delta_{5f} = \delta_{6f} = \delta_{7f} = 0$ and the alternative is stated as:

Ha: $\delta_{1f}, \neq \delta_{2f}, \neq \delta_{3f} \neq \delta_{4f} \neq \delta_{5f} \neq \delta_{6f} \neq \delta_{7f} \neq 0$ and lastly the null

hypothesis of no co-integration when $\Delta LnDPI_t$ in (25) is the dependent variable is

stated as:

Ho: $\delta_{1d}, = \delta_{2d}, = \delta_{3d} = \delta_{4d} = \delta_{5d} = \delta_{6d} = \delta_{7d} = 0$ and the alternative can is

stated Ha: $\delta_{1td}, \neq \delta_{2td}, \neq \delta_{3td} \neq \delta_{4td} \neq \delta_{5td} \neq \delta_{6td} \neq \delta_{7td} \neq 0$

The co-integration test is based on the F-statistics or Wald statistics. The

F-test has a nonstandard distribution. Thus, Pesaran and Pesaran (1997) and

Narayan, (2004) have provided two sets of critical values for the cointegration

test. The lower critical bound assumes that all the variables are I(0), meaning that

there is no co-integration among the variables, while the upper bound assumes

that all the variables are I(1). If the computed F-statistic is greater than the upper

critical bound, then the null hypothesis will be rejected suggesting that there

exists a co-integrating relationship among the variables. If the F-statistic falls

below the lower critical bounds value, it implies that there is no co-integration

relationship.

However, when the F-statistic lies within the lower and upper bounds,

then the test is inconclusive. In this context, the unit root test is conducted to

ascertain the order of integration of the variables. If all the variables are found to

be I(1), then the decision is taken on the basis of the upper critical value. On the

other hand, if all the variables are I(0), then the decision is based on the lower

critical bound value.

The ARDL method estimates $(P+1)^k$ number of regressions in order to obtain the optimal lags for each variable, where p is the maximum number of lags to be used and k is the number of variables in the equation (Shrestha & Chowdhury, 2005). The model is selected based on the Schwartz-Bayesian Criterion (SBC) or Akaike Information Criterion (AIC). The SBC uses the smallest possible lag length and is therefore described as the parsimonious model. The AIC chooses the maximum relevant lag length see (Shrestha & Chowdhury, 2005; and Jalil & Naveed, 2008).

Once co-integrating relationship is ascertained, the long run and error correction estimates of the ARDL model are obtained as given in (23-28):

$$LRGDP_t = \sigma_{0y} + \sum_{i=1}^{q}\delta_{1ty}LRGDP_{t-i} + \sum_{i=0}^{p_1}\delta_{2ty}LFDI_{t-i} + \sum_{i=0}^{p_2}\delta_{3ty}LDPI_{t-i} +$$

$$\sum_{i=0}^{p_3}\delta_{4ty}LLF_{t-i} + \sum_{i=0}^{p_4}\delta_{5ty}LEX_{t-i} + \sum_{i=0}^{p_4}\delta_{6ty}LOP_{t-i} + \sum_{i=0}^{p_4}\delta_{7ty}INFL_{t-i} + \theta_{ty}W + \psi_{ty} \qquad (26)$$

$$LFDI_t = \sigma_{0f} + \sum_{i=1}^{t_1}\delta_{1tf}LFDI_{t-i} + \sum_{i=1}^{u_1}\delta_{2tf}LRGDP_{t-i} + \sum_{i=1}^{u_2}\delta_{3tf}LDPI_{t-i} +$$

$$\sum_{i=1}^{u_3}\delta_{4tf}LLF_{t-i} + \sum_{i=1}^{u_4}\delta_{5tf}LXP_{t-i} + \sum_{i=1}^{u_4}\delta_{6tf}LOP_{t-i} + \sum_{i=1}^{u_4}\delta_{6tf}INFL_{t-i} + \theta_{tf}W + \psi_{tf} \qquad (27)$$

$$LDPI_t = \sigma_{0d} + \sum_{i=1}^{t_1}\delta_{1td}LDPI_{t-i} + \sum_{i=1}^{u_1}\delta_{2td}LRGDP_{t-i} + \sum_{i=1}^{u_2}\delta_{3td}LFDI_{t-i} +$$

$$\sum_{i=1}^{u_3}\delta_{4td}LLF_{t-i} + \sum_{i=1}^{u_4}\delta_{5td}LXP_{t-i} + \sum_{i=1}^{u_4}\delta_{6td}LOP_{t-i} + \sum_{i=1}^{u_4}\delta_{7td}INFL_{t-i} + \theta_{td}W + \psi_{td} \qquad (28)$$

The error correction representation of the series can be given as follows:

$$\Delta LRGDP_t = \alpha_{0yt} + \sum_{i=1}^{n}\beta_{1yt}\Delta LRGDP_{t-i} + \sum_{i=1}^{n}\beta_{2yt}\Delta LFDI_{t-i} + \sum_{i=1}^{n}\beta_{3yt}\Delta LDPI_{t-i} +$$

$$\sum_{i=1}^{n}\beta_{4y}\Delta LLF_{t-i} + \sum_{i=1}^{n}\beta_{5yt}\Delta LEX_{t-i} + \sum_{i=1}^{n}\beta_{6yt}\Delta LOP_{t-i} + \sum_{i=1}^{n}\beta_{7yt}\Delta INFL_{t-i} + \lambda_{yt}W + \xi_{yt}ECT_{t-1} + \varepsilon_{yt} \qquad (29)$$

$$\Delta LFDI_t = \alpha_{0ft} + \sum_{i=1}^{n} \beta_{1ft} \Delta FLDI_{t-i} + \sum_{i=1}^{n} \beta_{2ft} \Delta LRGDP_{t-i} + \sum_{i=1}^{n} \beta_{3ft} \Delta LDPI_{t-i} +$$

$$\sum_{i=1}^{n} \beta_{4ft} \Delta LLF_{t-i} + \sum_{i=1}^{n} \beta_{5ft} \Delta LXP_{t-i} + \sum_{i=1}^{n} \beta_{6ft} \Delta LOP_{t-i} + \sum_{i=1}^{n} \beta_{7ft} \Delta INFL_{t-i} + \lambda_{tf} W + \xi_{ft} ECT_{t-1} + \varepsilon_{ft} \tag{30}$$

$$\Delta LDPI_t = \alpha_{0dt} + \sum_{i=1}^{n} \beta_{1dt} \Delta LDPI_{t-i} + \sum_{i=1}^{n} \beta_{2dt} \Delta LRGDP_{t-i} + \sum_{i=1}^{n} \beta_{3dt} \Delta LFDI_{t-i} +$$

$$\sum_{i=1}^{n} \beta_{4dt} \Delta LLF_{t-i} + \sum_{i=1}^{n} \beta_{5dt} \Delta LXP_{t-i} + \sum_{i=1}^{n} \beta_{6dt} \Delta LOP_{t-i} + \sum_{i=1}^{n} \beta_{7dt} \Delta INFL_{t-i} + \lambda_{dt} W + \xi_d ECT_{t-1} + \varepsilon_{dt} \tag{31}$$

Where ξ is the speed of adjustment of the parameter and ECT_{t-1} is the residuals obtained from equations (23-25). The coefficient of the lagged error correction term (ξ) is expected to be negative and statistically significant to further confirm the existence of a co-integrating relationship.

The diagnostic test statistics of the selected ARDL model can be examined from the short run dynamics at this stage of the estimation procedure. Similarly, the test for parameter stability of the model can be performed by the CUSUM and CUSUMSQ statistics. If the plots of CUSUM and CUSUMSQ statistics stay within the critical bonds of five percent level of significance, the null hypothesis of all coefficients in the given regression are stable cannot be rejected.

Granger causality

Correlation does not necessarily imply causation in any meaningful sense of the word. The econometric graveyard is full of magnificent correlations, which are simply spurious or meaningless. The Granger (1969) approach to the question of whether X causes Y is to see how much of the current Y can be explained by past values of Y and then to see whether adding lagged values of X can improve the explanation. Y is said to be Granger-caused by X if X helps in the prediction

of Y, or equivalently if the coefficients of the lagged X's are statistically significant.

It is important to note that the statement 'X Granger causes Y' does not imply that Y is the impact or the result of X. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term. Granger's definition of causality states that X_t causes Y_t if the past history of X_t can be used to predict Y_t more accurately than simply using the past history of Y_t only. The usefulness of this type of causality can be summarized in at least two points (Feige and Pearce, 1979). First, it is equivalent to the econometric exogeneity so that unidirectional causality from the independent to the dependent variables is a necessary condition for the consistent estimation of the distributed lag models that do not involve lagged dependent variables. Second, it is concerned with leading indicators and rational expectation. For instance, Feige and Pearce (1979) have argued that testing for Granger-type causality is a useful way to evaluate what information can be usefully employed in forming economically rational expectations. Granger's definition of causality amounts to estimating:

$$X_t = \sum_{i=1}^{\infty} \alpha_i Y_{t-1} + \sum_{i=1}^{\infty} \beta_i X_{t-1} + \mu_t \qquad (3\ 2)$$

$$Y_t = \sum_{i=1}^{\infty} \varphi_i X_{t-1} + \sum_{i=1}^{\infty} \phi_i Y_{t-1} + \nu_t \qquad (3\ 3)$$

and testing $\alpha_i =$ (i=1,2,... ∞) so that X_t fails to cause Y_t. The error terms are assumed to fulfill,

$E(\mu_t) = E(\nu_t) = E(\mu_t\ \mu_s) = E(\nu_t\ \nu_s) = 0$; and $E(\mu_t\ \mu_t) = \sigma^2_{\mu}$, $E(\nu_t\ \nu_t) = \sigma^2_{\nu}$.

Summary

In summary, the methodology of this study was developed from an endogenous growth model in which technological progress, capital and labor inputs are the main determinants of long-term output of LRGDP. Explanation of the various tests of stationarity that will be adopted for this study were shown, also the various estimating equations that are going to be estimated were presented.

The ARDL approach to co-integration and error correction models are used to determine the adjustment to equilibrium among the key variables. The formulation of granger causality equations to determine the direction of causality of the variables under investigation was also considered. A priori expectation for the various variables are (+) Log of Real GDP, (+,-) Log of FDI, (+) Log of Domestic private investment, (+) Log of labor force, (+) Log of openness, (-) INFL and (+) Log of exports. From the various procedures discussed above, the next step will be to proceed to chapter four where testing of data and estimating the various equations, presentation and discussion of results shall be done.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter focuses on the results and its discussion. It begins with the unit root tests of the variables. Both the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests were utilized. This is followed by the ARDL co-integration analysis. The long and short run dynamics of the models are also presented followed by the analysis of the Granger Causality test for causal relationship.

Unit root test

Before applying the ARDL or Bounds Test to Co-integration, the establishment of the minimal integration order (d max) of the variables was carried out. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests on the various series that were included in the model were used. These tests were used to verify as to whether the variables are not integrated of an order higher than one. Real GDP (RGDP), Labor force (LF), foreign direct investment (FDI), domestic private investment (DPI), exports (XP) and openness (OP) were all transformed to natural logarithm. The Schwartz-Bayesian Criterion (SBC) and Akaike Information Criterion were used to determine the optimal number of lags

of the variables. Appendices A, B, C and D report the ADF and PP stationarity tests results of the variables at their levels and first differences with intercept and trend and intercept only.

The Appendices show that the ADF and PP statistics for all the variables excluding, foreign direct investment (FDI) and (INFL) were not stationary at levels. That is, the calculated t of FDI and INFL exceeded their respective critical values in absolute terms. This allows the conclusion that FDI and INFL are integrated of order zero [I(0)] meaning they are stationary at levels.

However, when first differences were taken on each of the non stationary level variables, the ADF and PP statistics as reported in Appendix B are higher than their respective critical values in absolute terms. These results indicate that Real GDP (LRGDP), labor force (LLF), domestic private investment (LDPI), openness (LOP) and exports (LXP) are integrated of order one [I(1)] according to the ADF and PP statistics. Meaning they are stationary at first difference.

Cointegration analysis

Since the aim of this study is to establish the relationship between economic growth and foreign direct investment, it is important to test for the existence of long-run equilibrium relationships among the variables within the framework of the bounds testing approach to co-integration. Given a small sample size and the use of annual data, a lag length of 2 was used in the bounds test. Pesaran and Shin (1999) suggested a maximum lag length of 2 for annual data in the bounds test approach. After the lag length was ascertained, the F-test statistic

computed within the framework of the ARDL model was compared with the upper and lower critical values in Narayan, (2004). Table 2 reports the bounds test results for Economic growth (LRGDP), Foreign Direct Investment (LFDI) and Domestic Private Investment (LDPI). K is the number of regressors in the various equations.

Table 2: F-tests for co-integration

F-statistics	5 percent CV	
K=4	Intercept & Trend.	
	I(0)	I(1)
$F_{(LRGDP \mid LFDI,LDPI,LLF,LXP,LOP,INFL)} = $ 4.9946	2.913	4.416
$F_{(LFDI \mid LRGDP,LDPI,LLF,LXP,LOP,INFL)} = $ 3.2062	2.913	4.416
$F_{(LDPI \mid LRGDP,LFDI,LLF,LXP,LOPINFL)} = $ 5.6932	2.913	4.416

Source: Estimation results. The critical values are obtained from Appendices A5 of Narayan, (2004).

From Table 2, the F-statistic for the model when LRGDP is endogenous is $F_{LRGDPC}(\cdot) = 4.9946$. It exceeds the upper critical bound at 5 percent significance level. This suggests that there is a long-run relationship between LRGDP and its explanatory variables, implying co-integration relationship.

Similarly, the F statistic for the model when LFDI is endogenous is $F_{LFDI}(\cdot) = 3.2062$. It falls below the upper critical value but above the lower critical values of the bounds test at 5 percent significance level. From the F-statistics is can be seen that the F-statistic for LFDI lies between the lower and upper critical

bound's value connoting the significance of the test of stationarity. From Appendix A, LFDI is integrated of order zero [I(0)]. So the stationarity test have validated that no long run and co-integrating relationship between LFDI and its explanatory variables exists since it is integrated of order zero.

Finally, when LDPI is endogenous, the F statistic for the model is $F_{LDPI}(\cdot)$ = 5.6932 as reported in Table 2 exceeds the upper critical bound at the 5 percent percent significance level, implying long-run relationship among LDPI and its explanatory variables and co-integration relationship as well. Thus, the ARDL models of LRGDP and LDPI can now be estimated to determine the short-run and long-run relationships respectively.

The existence of a co-integrating relationship among LRGDPC, LDPI and their explanatory variables motivated the estimation of the long-run coefficients and the short-run dynamic parameters. The Schwarz Bayesian Criterion (SBC) is used in the estimation of the ARDL models.

Long-run estimates: Dependent variable (LRGDP)

Having found the existence of a long run relationship in the equation with LRGDP as dependent variable and LFDI, LDPI, LLF, LEX, LOP and INFL as explanatory variables, the study proceeded to estimate the long run impact on the dependent variable. In other words, the study investigated the impact of foreign direct investment (LFDI), domestic investment (LDPI), labor force (LLF), exports (LEX), openness (LOP), and Inflation (INFL) on Real GDP (LRGDP). L represents logs of the variables. The ARDL estimates reveal that Inflation (INFL)

has negative impact on Real GDP at the 1 percent significance level. Specifically, a 1 percent increase in Inflation reduces economic growth by .043 percent. LFDI has a positive impact on Real GDP. That is a 1 percent increase in LFDI will increase economic growth by about 0.06 percent. The results also show that LRGDP increases in the long run by 0.69 percent if there is a 1 percent increase in the labor force.

Domestic investment exports and openness have positive impact on LRGDP at the (1, 5 and 5) percent significance levels respectively. A 1 percent increase in domestic investment increases economic growth by 1.21 percent. A 1 percent increase in exports will increase economic growth by 0.47 percent. From the results, it is seen that openness is significant to the growth of the economy. A 1 percent increase in openness will increase economic growth by 0.94 percent. War has a significant and negative impact on LRGDP at the 1 percent level. This result is consistent with the fact that economic instability results in lower output and thus contracts the growth of the economy as revealed by the statistically significant negative coefficient of (-0.19) at the 1 percent level. The error correction model that calculates the error correction term for the adjustment to short run equilibrium is given as:

ECM = LRGDP +062634*LFDI - 1.2099*LINV -.68734*LLF - 0.47293*LXP - 0.094253*LOP + 0.043023*INFL + 0.52188*D -3.8762*C -0 .10426*T. These results are reported in Table 3 below.

Table 3: Long-run estimates based on SBC-ARDL (1,0,0,1,0,0,1,1), dependent variable is (LRGDP)

Variable	Coefficient	Standard error	T T-Ratio [Prob.]
LFDI	0.062634	0.030996	2.0207[0.058]*
LDPIN	1.2099	0.19090	6.3381[0.003]***
LWF	0.68734	0.15894	4.3245[0.037]**
LXP	0.47293	0.18365	2.5752[.019]**
LOP	0.94253	0.19031	4.9527[0.062]**
INFL	-0.043023	.0047943	-8.9738[0.031]***
WAR	-0.19986	0.066242	-3.0172[0.006]***
C	6.8207	1.9504	3.4972[0.002]***
T	.10426	.042240	2.4681[0.080]*

Diagnostic Tests

Test Statistics	LM Version	F Version
Serial Correlation	CHSQ (1) = .0052325 [.942]	F(1, 18) = .0029438[.957]
Functional Form	CHSQ (1) = .011195 [.916]	F(1, 18) = .0062996[.938]
Normality	CHSQ (2) = .75323 [.686]	Not applicable
Heteroscedasticity	CHSQ (1) = .40240 [.526]	F(1,30) = .38206[.541]

Source: Estimation results. Note: * ,** and *** indicate (10, 5 and 1) percent significance level.

Short-run dynamics: Dependent variable (DLRGDP)

The Short-run dynamics results as reported in from Table 4 show that foreign direct investment (DLFDI) has a positive and statistically significant impact on economic growth at the 5 percent significance level. A 1 percent increase in dLFDI increases economic growth by 0.67 percent. Domestic investment is also positive and significant with a coefficient of (0.78) at the 5 percent significance level revealing an increase in DLRGDP by that amount if there is a 1 percent increase in domestic private investment (dLINV). Labor force is positive and significant with a coefficient of 2.72 indicating an increase in economic growth (DLRGP) by this amount if there is a 1 percent increase in the labor force (dLLF). Exports and openness both have positive impact on economic growth. A 1 percent increase in exports (dLEX) and openness (dLOP) will increase economic growth (DLRGDP) by 0.30 and 0.61 percent at the (1 and 5) percent significance levels respectively. Inflation with a coefficient of 0.03 has a negative impact on economic growth. A 1 percent increase in inflation (dLINF) will decrease economic growth (DLRGDP) by 0.03 percent at the 10 percent significance level. The dummy for war still has a negative and significant impact on economic growth at the 5 percent significance level.

The results also show that the coefficient of the lagged error correction term (-0.64) is negative and statistically significant at the 1 percent significance level. This indicates that 64 percent of any shock to the system in the current period can be adjusted in the next period. These findings are reported in Table 4.

Table 4: Short-run dynamic results ARDL (1,0,0,1,0,0,1,1), dependent variable is (DLRGDP)

Variable	Coefficient	Standard Error	T-Ratio	[Prob.]
dLFDI	0.66998	0.027621	2.4256	[0.011]**
dLINV	0.77755	0.13112	5.9302	[0.050]**
dLLF	2.7257	0.99514	2.7390	[0.012]**
dLXP	0.30392	0.076662	3.9645	[0.001]***
dLOP	0.60570	0.12082	5.132	[0.050]**
dINFL	-0.02941	0.016684	-1.7626	[0.082]*
D	-0.19799	0.071869	-2.7548	[0.012]**
C	2.4910	14.2038	0.17537	[0.862]
T	-0.04025	0.027541	-1.4651	[0.158]
ECT(-1)	-0.64263	0.14812	-4.3387	[0.000]***

R-Squared		.90583	R-Bar-Squared	.84635
S.E. of Regression		.11048	F-stat. F(9, 22) 20.3062 [.000]	
Mean of Dependent Variable	-.0053159		S.D. of Dependent Variable .28185	
Residual Sum of Squares		.23191	Equation Log-likelihood	33.4283
Akaike Info. Criterion		20.4283	Schwarz Bayesian Criterion 10.9011	
DW-statistic		1.9490		

Source: Estimation results. Note: ***,** and * indicates (1, 5 and 10) percent significance level.

Diagnostic and stability tests

The diagnostic tests of the estimated ARDL (1,0,0,1,0,0,1,1) model suggest that the model pass the Lagrange multiplier test of residual serial correlation, Ramsey's RESET test using the square of the fitted values is also passed, the Normality test based on a test of skewness and kurtosis of residuals was also passed and lastly, the heteroscedasticity test based on the regression of squared residuals on squared fitted values is also passed. Also, the plots of the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) stability tests as depicted in Appendix E, indicate that all the coefficients of the estimated model are stable over the study period since they are within the 5 percent critical bounds.

Long-run estimates: Dependent variable (LDPI)

The estimation of ARDL model (1,0,0,0,0,0,0,0) when domestic investment is dependent variable is reported in Table 5 show that almost all variables were significant in enhancing log domestic private investment (LDPI) the long run. The results show that Log Real GDP (LRGDP) is significant at the 5 percent significance level with a coefficient of 1.04 indicating an increase in domestic private investment by this amount if LRGDP increased by 1 percent. Log foreign direct investment (LFDI) with a coefficient of -0.31 has significant impact and would decrease domestic private investment by that amount if it increases by 1 percent. The results show that Log labor force (LLF), Log of openness (LOP) and Log of exports (LOP) with positive coefficients of 2.31, 0.93

and 0.16 respectively, with export and openness being significant in enhancing the growth of domestic private investment in Liberia in the long-run. Specifically, a 1 percent increase in the LXP, and LOP would increase LDPI by 0.93 and 0.16 percent respectively. Table 5 presents these results.

Table 5: Long-run estimates based on SBC-ARDL (1,0,0,0,0,0,0,0), dependent variable is (LDPI)

Variable	Coefficient	Standard Error	T-Ratio [Prob.]
LRGDP	1.0372	0.44799	2.3153 [0.030]**
LFDI	-0.31768	0.79710	-3.9854 [0.069]*
LLF	2.3074	2.0124	1.1466 [0.650]
LOP	0.92951	0.34765	2.6737 [0.014]**
LXP	0.15841	0.022903	6.9165 [0.044]**
INFL	-.088982	0.051575	-1.7253 [0.098]*
D	-0.071733	0.24563	-0.29204 [0.773]
C	-4.71832	2.40534	-1.9616 [0.063]**
T	-0.12567	0.055186	-2.2773 [0.033]

<div align="center">Diagnostic Test</div>

Test Statistics	LM Version	F Version
Serial Correlation	CHSQ (1) = 0.92792 [0.335]	F(1, 21)= .62713[.437]
Functional Form	CHSQ (1) = 2.5796 [0.108]	F(1, 21)= 1.8413[.189]
Normality	CHSQ (2) = 1.3065 [0.520]	Not applicable
Heteroscedasticity	CHSQ (1) = 1.0397 [0.308]	F(1,30)= 1.0074[.324]

Source: Estimation results using Mrcorfit 4.1. Note: ***, ** and * indicate (1, 5 and 10) percent significance level.

The labor force is positive but not significant.

The plots of the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) stability tests for FDI as depicted in Appendix F indicates that all the coefficients of the estimated model are sable over the study period since they are within the critical bounds.

Short-run dynamics: Dependent variable (DLDPI)

Similarly, the short-run dynamic results of the selected ARDL (1,0,0,0,0,0,0) model as reported in Table 6 reveal that growth in Real GDP, foreign direct investment, labor force, openness and exports have positive coefficients. It is only inflation that has a negative coefficient. Specifically, A 1 percent increase in dLRGDP will increase growth in domestic private investment DLDPI by 0.45 percent at the 5 percent significance level. The results also show that growth in foreign direct investment dLFDI was positive but not significant. DLDPI will increase by 1.69 percent if there is a 1 percent increase in the labor force. And this was significant at the 1 percent conventional level. Growth in exports dLXP with a positive and 5 percent significance level coefficient will increase DLDPI by 0.56 percent if it increases by 1 percent. Growth in openness dLOP also has a positive impact on growth of domestic private investment. A 1 percent increase in dLOP will increase DLDPI by 0.40 percent at the 1 percent significance level. Inflation which captures macroeconomic instability will decrease domestic private investment growth by -0.038 percent if it were to increase by 1 percent. And this was significant at the 10 percent conventional

level. The dummy for war was negative but insignificant. These results are reported Table 6.

Table 6: Short-run dynamic results ARDL (1,0,0,0,0,0,0,0), dependent variable (DLDPI)

Variable	Coefficient	Standard Error	T-Ratio [Prob.]
dLRGDP	0.44912	0.20901	2.1488 [0.043]**
dLFDI	0.0013756	0.034432	0.03995 [0.968]
dLWF	1.6919	0.37122	4.55765 [0.010]***
dLOP	0.40248	0.13454	2.9916 [0.007]***
dLXP	0.58590	0.166946	3.5095 [0.042]**
dINFL	-0.038529	0.019580	-1.9677[0.062]*
D	-0.31060	0.10052	-3.0891[0.046]**
C	2.4304	1.25955	1.6222 [0.119]
T	-0.054417	0.029272	-1.8590[0.076]*
ECM(-1)	-0.43300	0.13486	-3.2108[0.004]***
R-Squared	0.89637	R-Bar-Squared	0.84262
S.E. of Regression	0.14734	F-stat. F(9, 22) 3.9652 [0.004]	
Mean of Dependent Variable -0.012012		S.D. of Dependent Variable 0.20099	
Residual Sum of Squares	0.47759	Equation Log-likelihood	21.8696
Akaike Info. Criterion	11.8696	Schwarz Bayesian Criterion	4.5409
DW-statistic	1.8932		

Source: Estimation results. Note: *** and** indicate (1 and 5) percent significance level.

Any shock to the system in the current period can be corrected by the error correction term which is calculated from the error correction model as:

ECM = LDPI - 1.0372*LRGDP + 0.31768*LFDI -2.3074*LLF -0.92951*LOP - 0.15841*LXP +.088982*INFL +.071733*D + 4.71832*C + 0.12567*T

From the results, the coefficient of the lagged error correction term ECT(-1) is negative (-.43) and significant at the 1 percent conventional level. This indicates a moderate adjustment to equilibrium from any shock to the system.

Diagnostic and stability tests (LDPI)

The diagnostic tests of the estimated ARDL (1,0,0,0,0,0,0,0) model suggest that the model pass the Lagrange multiplier test of residual serial correlation, Ramsey's RESET test using the square of the fitted values is also passed, the Normality test based on a test of skewness and kurtosis of residuals was also passed and lastly, the heteroscedasticity test based on the regression of squared residuals on squared fitted values is also passed. The plots of the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) stability tests as depicted in Appendix F, indicate that all the coefficients of the estimated model are stable over the study period since they are within the 5 percent critical bounds.

Granger causality

Having identified economically meaningful co-integrating vectors, the study preceded to causality tests according to Engle and Granger (1987). In a

causality test, four findings are possible; when the sets of coefficient are not statistically significant, we say none of the variable Granger causes each other, meaning the variables are independent (no causality). On the other hand, there may be unidirectional causality meaning that X may Granger cause Y but not the other way round. It could also be the case where Y Granger causes X but not the other way round. Table 7 presents Granger Causality Test for the dependent variables.

Table 7: Pairwise granger causality tests

Null Hypothesis:	F-Statistics	Prob.	Remarks:
LFDI does not Granger Cause LRGDP	0.14640	0.7046	Cannot reject the null
LRGDP does not Granger Cause LFDI	0.29617	0.5902	Cannot reject the null
LDPI does not Granger Cause LRGDP	3.00316	0.0930*	Null is rejected
LRGDP does not Granger Cause LDPI	0.01081	0.9179	Cannot reject the null
LDPI does not Granger Cause LFDI	0.00860	0.9267	Cannot reject the null
LFDI does not Granger Cause LDPI	0.93197	0.8593	Cannot reject the null.

Source: Estimation results. Note: * indicates rejection of the null at 10 percent significance level.

Furthermore, X and Y may cause each other meaning that there is feedback impact (bidirectional causality). From the results it is shown that there is unidirectional causality running from log of domestic private investment (LDPI) to log of Real GDP (LRGDP) but no causality from either LRGDP to LFDI or LFDI to LRGDP

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Discussion

Introduction

This section gives a detailed discussion of the results of the study. It tries to relate the findings of the study to previous works as provided in the literature in order to justify the different results of the different models and provide interpretation of the results.

LRGDP, Long Run Estimates

The ARDL estimates reveal that in the long run, all explanatory variables except inflation have positive impact on economic growth at accepted significance level. Specifically, a 1 percent increase in foreign direct investment will increase economic growth by 0.063 percent at the 10 percent significance level. The result is consistent with the findings of (Esso, 2010; Zhang, 2001; Ayadi, 2009; Lall, 1985; Vernon, 1977) that found a positive relationship between FDI and economic growth. Romer (1986) earlier argued that trade and contact with foreign enterprises provide access to knowledge of new product and production styles. Accordingly, FDI provides capital, technology and improvement in labor employment of a host country. They also provide greater competition which is positively correlated to growth (Nickell, 1996).

The result shows that domestic private investment is significant to the growth of the economy in the long run. A one percent increase in domestic private investment will increase LRGDP by 1.21 percent at the 1 percent conventional level. This result is in line with the findings of (Tang et al., 2008; Ahmed & Makil

2009) who argued that great domestic investment spurs large economic growth, and vice versa. That is because domestic firms reinvest their profits which generate extra revenue for an economy. War has a significant and negative impact on LRGDP at the 1 percent significance level. This result is consistent with the fact that economic instability results in lower output and thus contracts the growth of the economy as revealed by the statistically significant negative coefficient of (-0.20) at the 1 percent significance level.

The results also show that a 1 percent increase in exports, openness and the labor force will increase economic growth by (0.47, 0.94 and 0.69) percent respectively. These statistics are significant at the 5 percent conventional level. Das (1987) argued that exports of a country provide foreign exchange earnings for a host country and this is favorable for its BOP positions.

The results are consistent with the literature which shows that openness is significant in enhancing economic growth. That is, if the barriers to international transactions are lower, the higher the level of integration and the benefits (Asiedu, 2006; Ayanwale, 2007). And this is shown by the positive and significant coefficient of 0.94. The results also show that the increase in the labor force is significant to the growth of the Liberian economy. This is consistent with the argument of (Jayaraman & Singh, 2007) who asserted the there can be no growth achievement without the involvement of labor as a factor input hence, the positive and significant coefficient of 0.69.

Furthermore, inflation with a coefficient of -.043 has a negative and significance impact on economic growth. Specifically, a one percent increase in

inflation will decrease economic growth by 0.043 percent. This variable is used to capture macroeconomic instability, (Asiedu, 2006). It shows that stability of a country is an important element for achieving economic growth. A higher level of inflation represents distortion in an economy. If LDCs are streamlining their investment regulatory framework, implementing policies which promote macroeconomic stability and improve infrastructure, they can achieve a higher level of economic growth (Asiedu, 2006; Asiedu, 2003). War has a negative impact on the growth of the economy.

DLRGDP, Short run dynamics

The short-run dynamics results show that foreign direct investment (dFDI) has a positive and statistically significant impact on economic growth at the 5 percent significance level. A 1 percent increase in dLFDI increases DLRGDP by 0.67 percent. This is simple because FDI generate additional capital for savings and investment that are constraining developing countries. Lall (1985) and Vernon (1977) have argued that foreign investment come to host country with a package, including capital, technology, and management and marketing skills. They, thus, can improve competition, efficiency; provide additional jobs and financial resources in an economy.

Domestic investment is also positive and significant with a coefficient of (0.78) at the 5 percent significance on DLRGDP. A 1 percent increase in dLDPI will increase DLRGDP by 0.78 percent. This finding is in line with the results of

(Arthukorala 2003; Tang et al., 2008; Ahmed & Makil 2009). They argued that a large domestic investment spurs large economic growth.

Similarly, the growths in Labor force (dLFF), exports (dLEX) and openness (dLOP) were positive and significant at the (5, 1 and 5) percent significance levels respectively. A 1 percent increase in the dLLF in the short run would increase DLRGDP by 2.7257 percent. Also, a 1 percent increase in dLXP wIll increase DLRGDP by 0.30 percent and a 1 percent increase in dLOP will increase DLRGDP by 0.61 percent. These findings are in line with the findings of (Jayaraman & Singh 2007; Ayanwale, 2007; Asiedu, 2006; Romer, 1986; Das 1987; Tang et al., 2008). The results show that an increase in the labor force positively impacted economic growth. Also, the international connection of a host country which is captured by the openness variable is a means whereby new skills and knowhow as well as technologies of the advance economy can be transferred to host nations. And lastly, the coefficient of exports shows that is brings greater benefits to a host country by bringing in foreign exchange earnings Lall (1985).

From the results, it is seen that inflation which represents macroeconomic instability has a negative impact on economic growth. Specifically a 1 percent increase in inflation will cause growth in Real GDP (DLRGDP) to fall by 0.029 percent. This result confirms the finds of (Asiedu, 2003; Asiedu, 2006) who argued that a host country can reduce the level of distortion in their economic if it serves as a means to achieve high level of economic growth. Also, the coefficient of the lagged error correction term (-0.64) is negative and statistically significant at the 1 percent significance level. This negative and significant coefficient is an

indication of co-integration among the variables. It further suggests that 64 percent of any disequilibrium due to the previous year's shock converges back to long-run equilibrium in the current year.

LDPI, Long Run Estimates

The estimation of ARDL model (1,0,0,0,0,0,0,0) when domestic investment is dependent variable, as reported in Table 5 shows that all variables with the exception of foreign direct investment and inflation have positive impact of domestic private investment in the long run. It is seen that Real GDP is significant at the 5 percent significance level with a coefficient of 1.037 indicating an increase in domestic private investment by this amount if Real GDP increases by 1 percent. This result is in line with that of (Ahmed & Makil 2009; Tang et al., 2008) who argued that domestic private investment is greatly enhanced by economic growth. That is great economic growth spurs large domestic investment.

It is also seen that foreign direct investment has a negative impact on domestic private investment in Liberia in the long run. This finding corresponds to that of Kokko, Tansini and Zejen (1996), Aitken and Harrison (1999). They asserted that domestic productivity is found to be negatively associated with the intensity of foreign presence. Simply because foreign firms take away market shares from domestic firms because of their efficient and high technology production mechanism. Furthermore, best skilled labor of domestic firms are

taken away leaving domestic firms to produce at lower than optimal production levels.

From the results it also seen that the labor force has positive impact on domestic private investment with a coefficients of 2.30 but was not significant. Openness has positive impact on domestic investment at the 5 percent significance level. This result supports the fact that openness to trade allows domestic firms to have access to international markets by exporting their commodities. This allows domestic firms to have access to international trade, international capital transactions, and the international exchange of knowledge (Ayanwale, 2007).

Furthermore, the results show that export is a key in enhancing domestic capital productivity. According to Das (1987), export is the transmission mechanism through which domestic firms can compete with foreign firms. By exporting their products they can generate foreign exchange earnings and provide greater means of competition with foreign capital. This is shown by the positive and significant coefficient of 0.16 at the 5 percent conventional level.

According to Asiedu (2003), and Asiedu (2006) macroeconomic instability can increase the level of distortion in an economic thereby reducing the productivity level of businesses. Inflation as can be seen have a negative and significant coefficient at the 10 percent accepted level. This means that a 1 percent increase in inflation will cause domestic private investment to fall by -0.89 percent. Also the dummy for war was negative but not significant.

DLDPI, Short Run Estimates

The Short-run dynamic results of the selected ARDL (1,0,0,0,0,0,0,0) model reveal that all explanatory variables except inflation have positive impact on domestic private investment. The coefficients reveal that a 1 percent increase in Real GDP would increase domestic investment by 0.45 percent at the 5 percent significance level. The results also show that foreign direct investment has a positive sign but was not significant. It is also seen that the labor force has a positive and 1 percent significance level coefficient. That is, a 1 percent increase in the labor force will increase domestic investment by 1.69 percent. The openness variable is positive and significant at the 1 percent accepted level. The variable export has a positive sign and is significant at the 5 percent significance level. These results are in line with the works of (Ayanwale, 2007; Asiedu, 2006; Das 1987). The dummy capturing the effect of war was positive and significant at the 5 percent conventional level.

The results also show that the coefficient of the lagged error correction term ECT (-1) is negative (-.43) and significant at the 1 percent conventional level. This indicates that 43 percent of any disequilibrium caused by previous year's shock to the system would be corrected in the current period.

Finally, when pair-wise Granger Causality test is performed for the various dependent variables the findings disclosed that there is un-directional causality running from domestic private investment (LDPI) to Real GDP (LRGDP) but not from either economic growth to foreign direct investment. This result as reported in Table 7 corresponds to that of Ericsson and Irandoust (2001)

who examined the causal effects between FDI and output growth for four OECD countries. Their results found no causal relationship between output growth and FDI in Denmark and Findland.

Conclusion

This chapter focused on the estimation of the models and the presentation and discussion of the results of the study. It began with the unit root tests both the ADF and PP of which it was established that foreign direct investment (LFDI) and inflation (INFL) were stationary at levels, while Real GDP (LRGDPC), domestic private investment (LDPI), labor force (LLF), exports (LEX) and openness (LOP) were stationary at first difference. All variables were transformed into natural logarithm.

The study further conducted the test for Co-integration and found that Real GDP (LRGDP) and domestic private investment (LDPI) were co-integrated at the upper critical bound, while foreign direct investment (LFDI) was not co-integrated by the critical bounds values provided by Narayan, (2004).

From the results of the long run estimates when Real GDP is dependent on the explanatory variables (LFDI, LDPI, LLF, LEX, LOP and INFL), the findings showed that LFDI, LDPI, LLF, LEX, LOP and INFL, and the dummy variable capturing the impact of War were significant in explaining economic growth. The results also showed that in the short run, with the exception of inflation (INFL), all relevant explanatory variables had positive impact on economic growth. War still had a negative impact on economic growth in the short run. The error

correction term ECM (-1) for the model was negative (-64) and significant indicating a fair recovery statistics.

When the model with domestic private investment (LDPI) as dependent variable was estimated, the results showed that Real GDP, exports, openness, exports were positive and significant while inflation was negative and significant in explaining domestic private investment in the long run. Labor force was positive but not significant. In the short run however, Real GDP all variable carried expected sign with foreign direct investment not being significant. The model also suggested that the speed of adjustment as given by the error correction term ECT(-1) was negative (-43) and significant, indicating a moderate adjustment to equilibrium.

Finally, pair-wise Granger Causality tests for the various dependent variables showed that there was a un-directional causality running from domestic private investment (LDPI) to Real GDP (LRGDP) implying that it is domestic private investment that influences Real GDP in Liberia. The study also examined the stability of the different models and found that all the models were stable over the sample period. The study now proceeds to the next chapter five; where concluding remarks and policy recommendations for the study are presented.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter summarizes the findings of the study which sought to investigate the relation between foreign direct investment and economic growth in Liberia from 1975-2009. The study in addition sought to identify any possible long or short run nexus among the variables for the period. The chapter furthermore provides policy recommendations to the Liberian Government for possible consideration in order to possibly enhance the growth of the economy and the productivity of its citizenry through the effective use of foreign investment.

Summary

The objectives of this study were to investigate the relationship between foreign direct investment and economic growth in Liberia and to determine if a long or short run relationship exists among the variables. To this end, the study investigated the relationships between foreign direct investment and economic growth for Liberia using the Auto Regressive Distributed Lagged Model developed by (Pesaran & Shin, 1999) and the pair-wise Granger Causality Test by (Engle & Granger, 1987).

Four steps were adopted in generating the results. First, the data series – Real GDP, foreign direct investment, domestic investment, labor force and the three policy variables: openness, exports and inflation were subjected to ADF and PP tests in order to ascertain the nature of stationarity properties of the variables. The ADF tests revealed that all variables except FDI and inflation were integrated of order one.

Secondly, a search for possible long run relationships among the variables by using the bounds testing approach to co-integration was carried out. The results showed that there were co-integrating relationships between Real GDP and domestic private investment (LDPI) and their explanatory variables. These findings paved the way for estimating the relationships between economic growth Real GDP and domestic private investment and their explanatory variables.

The short-run dynamics of the ARDL estimator when DLRGDP is endogenous revealed that all the explanatory variables have significant impact on economic growth. Of the significant variable it was only inflation that had a negative impact on economic growth. War was negative as expected. The error correction term, ECT (-1), was negative and significant indicating a good recovery from previous year's shock. This suggested that 64 percent of previous year's disequilibrium was adjusted in the current period. In the long-run it was only inflation that had negative and statistically significant impacts on Liberia's economic growth. Labor force which is positive and significant has high influence on economic growth. As expected, war had negative and statistically significant impact on economic growth for the period specified.

When domestic investment is endogenous, the short run dynamics showed that economic growth, exports, labor force and openness have positive impact on domestic private investment. Foreign direct investment was positive and not significant to the growth of domestic private investment in Liberia, while inflation was negative and significant in explaining domestic private investment.

Considering the long run estimates, the results showed that economic growth was positive and significant, foreign direct investment was negative and significant to the growth of domestic investment in Liberia. Export was positive and significant. Openness was positive and significant while labor force was positive and insignificant. Inflation was negative and significant in explaining the growth of domestic private investment. War was also negative but not significant. The estimation further revealed that any disequilibrium caused by previous year's shock in the system would be corrected for by 43 percent.

Finally, investigation of the direction of causation among the variables using the Granger causality testing procedure was utilized. Results showed that unidirectional long run causality runs from domestic investment to economic growth and not otherwise.

Of the two models, examination of the diagnostic and stability test statistics showed that all the models were satisfactory according to the LM and F version. The plots of the cumulative sum of recursive residuals (CUSUM) and cumulative sum of squares of recursive residuals (CUSUMSQ) stability tests for the two models indicated that all the coefficients of the estimated models are sable

over the study period since they were found to be within the 5 percent critical bounds level.

Conclusions

From the results, the objectives of investigating the relationship among foreign direct investment, domestic investment and economic growth was accomplished. When considering short run and long impacts, foreign direct investment, domestic investment, exports and openness all serves as stimuli for economic growth in the short and long run. These findings reveal that there are benefits from foreign direct investment as reveal in the literature. Foreign direct investment comes to host country with a package including capital, technology, and management and marketing skills. Thus, it can improve competition, efficiency; provide additional jobs which enhance output growth of a country (Lass, 1985; Vernon, 1977). And domestic investment can contribute more to economic growth when they engage in international trade as shown by the positive and significant coefficient of openness and exports.

Finally, when considering domestic investment, the short run statistics showed that a key to increasing domestic private investment in Liberia is Real GDP while foreign direct investment serves to crowd-out or supplement domestic private investment in the long run. The results also show that it is economic growth, openness and export that stimulate domestic investment in the long run with causality runs from domestic private investment to Real GDP and not otherwise.

Recommendations

The variables used for policy purposes; exports, openness and inflation seem to have significant impact on each of the two endogenous variables used for the estimation. Exports as shown in the result, is important to the growth of the Liberian economy. That is to say, the Government of Liberia should provide incentives to local firms in the form of lower export tariffs to enable them export more and compete with foreign presence since it is significant for local firm to export.

Though foreign direct investment has a positive impact on economic growth over the study period, the results show that macroeconomic stability which is proxied by inflation is important in explaining economic growth. Government of Liberia should make sure that targeting a stable macroeconomic environment be a priority. The more stable the economy, the better will be the prospect of huge output growth. Therefore, inflation should be kept at a moderate level since high levels of inflation indicate high level of distortion in Liberia.

Furthermore, from the findings of the study, it is realized that openness is relevant in enhancing domestic investment which further enhances growth of the Liberian economy. Government needs to ensure that trade policies are established to promote international transactions, diffusion of technology and market access in order to create an atmosphere where all partners benefit from international trade.

Limitations of the study

This study is not free of drawbacks; data for domestic investment or gross capital formation could not be used, but instead investment as a share of GDP was used as a proxy for domestic private investment. Furthermore, the study did not use a large sample size due to the unavailability of data for Liberia. And sector-specific impact of FDI could not be established since data for the various sectors were not available. And lastly, data for corruption and the rule of law could not be used due to their inaccessibility.

Direction for further studies

Because research on disaggregated data with both cross sectional and longitudinal variation is still limited due to their unavailability, the message is clear: More systematic research is needed. More discriminating work is also required. Analysis that probes what really matters, forms of FDI, ownership characteristics, corporate governance, absorptive capacity of domestic firms, and, labor productivity enhancement could be undertaken in future studies to help provide solutions to the many problems that exists in Liberia.

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APPENDICES

APPENDIX A

TEST FOR THE ORDER OF INTEGRATION (ADF AND PHILLIPS PERRON): LEVELS WITH INTERCEPT AND TREND

Var.	ADF Stats [LL] {C.V.} (P.V.)	PP Stats. [BW] {C.V.} (P.V.)
LRGDP	-2.447607 [2] -3.212361 (0.3500)	-1.7742285 [3] -3.207094 (0.7100)
LDPI	-1.728492 [1] -3.20642 (0.7157)	-1.456613 [2] -3.207094 (0.8248)
LFDI	-4.220609 [1] -3.209642 (0.0111) **	-3.663308 [5] -3.2070940 (0.0390)**
LLF	-1.567895 [4] -3.218382 (0.7817)	-1.342698 [4] -3.207094 (0.8595)
LOP	-1.774472 [0] -3.207094 (0.6948)	-1.774472 [0] -3.207094 (0.6948)
LXP	-1.654842 [0] -3.207094 (0.7491)	-1.8116322 [4] -3.207094 (0.6746)
INFL	-5.855161 [0] -4.252879 (0.0002)****	-5.856892 [2] -4.252879 (0.0002)***

Source: Estimation result using eviews 7. Note: ** and *** means (5 & 1) percent levels of significance

APPENDIX B

TEST FOR THE ORDER OF INTEGRATION (ADF AND PHILLIPS

PERRON): FIRST DIFFERENCE WITH INTERCEPT AND TREND

VAR.	ADF STATS	[LL]	CV	PV	P.P STAT	[BW]	CV	PV
LRGDP	-4.028108	[0]	-3.209642	(0.0174)**	-4.128860	[3]	-3.552973	(0.0138)**
LDPI	-4.352635	[0]	-4.262735	(0.0084)***	-4.234372	[8]	-3.552973	(0.0107)**
LLF	-3.256452	[2]	-3.215267	(0.0924)*	-3.699968	[3]	-3.552973	(0.0365)**
LXP	-7.004936	[0]	-4.262735	(0.0000)***	-6.866255	[4]	-4.262735	(0.0000)***
LOP	-5.360921	[3]	-4.296729	(0.0008)***	-22.58257	[3]	-4.262735	(0.0000)***

Source: Estimation results using eviews 7. Note: *, **and *** means 10 percent, 5 percent and 1 percent level of significance

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APPENDIX C

TEST FOR THE ORDER OF INTEGRATION (ADF AND

PHILLIPS PERRON): LEVELS WITH INTERCEPT ONLY

VAR.	ADF STATS [LL]	CV	(PV)	PP STATS.[BW]	CV	(PV)
LRGDP	-1.566543 [1]	-2.615817	(0.4880)	-1.326994 [3]	-2.614300	(0.6056)
LDPI	-1.167039 [0]	-2.614300	(0.6771)	-1.277408 [3]	-2.614300	(0.6286)
LFDI	-3.912979 [0]	-3.639407	(0.0050)***	-3.760361 [4]	-3.760361	(0.0074)***
LLF	0.006339 [3]	-2.619160	(0.9522)	-0.260175 [4]	-2.614300	(0.9207)
LOP	-2.100049 [0]	-2.614300	(0.2459)	-1.985098 [1]	-2.614300	(0.2917)
LXP	-0.534484 [1]	-2.615817	(0.8717)	-1.432230 [4]	-3.207094	(0.5550)
INFL	-5.863912 [0]	-3.639407	(0.0000) ***	-5.864951 [2]	-3.639407	(0.0000)***

Source: Estimation results using eviews 7. Note: *** means 10 percent, 5 percent and 1 percent level of significance

APPENDIX D

TEST FOR THE ORDER OF INTEGRATION (ADF AND PHILLIPS PERRON): FIRST DIFFERENCE WITH INTERCEPT ONLY

VAR.	ADF STATS [LL]	CV	(PV)	P.P STAT [BW]	CV	(PV)
LRGDP	-3.381250 [0]	-2.954021	(0.0190)**	-3.385788 [2]	-2.954021	(0.0188)**
LDPI	-4.705079 [0]	-3.646342	(0.0006)***	-4.724010 [2]	-3.646342	(0.006)***
LWF	-3.091483 [2]	-2.960411	(0.0376)**	-3.487745 [3]	-2.954021	(0.0147)**
LXP	-4.245756 [0]	-3.646342	(0.0021)***	-4.282883 [2]	-3.646342	(0.0019)***
LOP	-7.457877 [0]	-3.646342	(0.0000)***	-7.864746 [5]	-3.646342	(0.0000)***

Source: estimation results using reviews 7. Note: *, **and *** means 10 percent, 5 percent and 1 percent level of significance
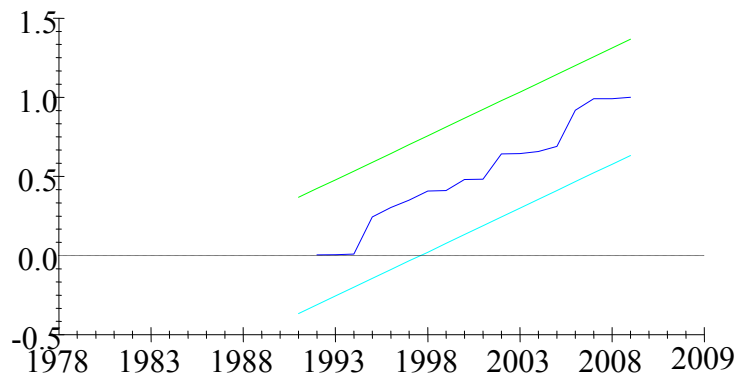
PLOT OF CUMULATIVE SUM AND CUMULATIVE SUM OF

SQUARES OF RECURSIVE RESIDUALS STABILITY TESTS

(LRGDP IS DEPENDENT VARIABLE)
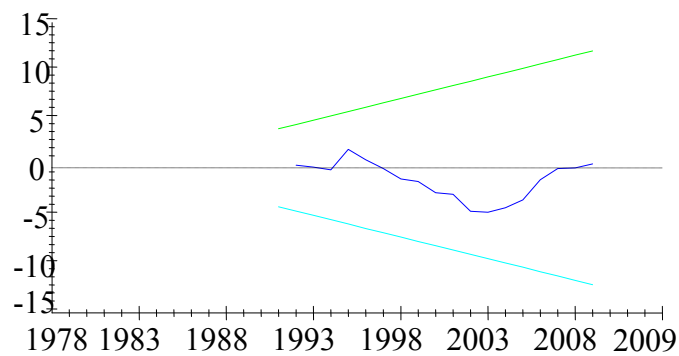
Note: The straight lines represent critical bounds at 5% significance level
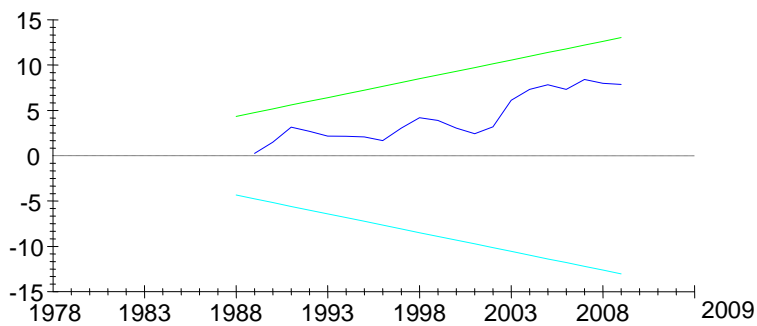
Source: Estimation results using Microfit 4.1

Note: The straight lines represent critical bounds at 5% significance level

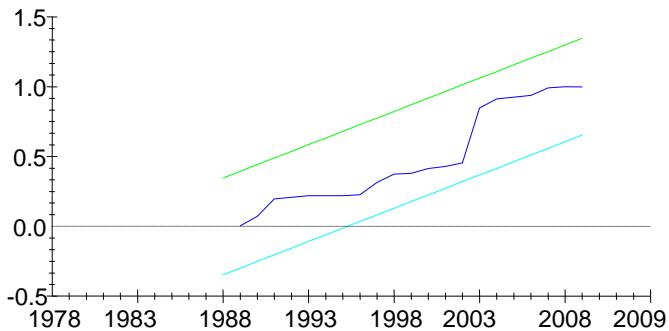Source: Estimation results using Microfit 4.1

APPENDIX F

PLOT OF CUMULATIVE SUM AND CUMULATIVE SUM OF SQUARES

OF RECURSIVE RESIDUALS STABILITY TESTS (LDPI IS

DEPENDENT VARIABLE)

Note: The straight lines represent critical bounds at 5% significance level

Source: Estimation results using Microfit 4.1

Note: The straight lines represent critical bounds at 5% significance level

Source: Estimation results using Microfit 4.1

APPENDIX H

Derivation of equation 4

From Y= K $^{\alpha}$ A$_t$ L $^{1\ -\alpha}$ ------------------ (1),

Taking logs on both sides yields Ln $Y= \alpha K + (1- \alpha)(A+L)$. If we divide both sides

by *AL* the equation becomes $\dfrac{LnY}{AL} = \dfrac{\alpha K}{AL} + (1-\alpha) =$ Let assume that $\dfrac{LnY}{AL} =$ Y' and

$\dfrac{K}{AL} =$ K' and $\dfrac{1-\alpha}{AL} = 1$, that is if markets are competitive, the contributions of

each factor input to output (i.e. α and (1- α)) are equal to their respective shares in

the total income (output) and that there is no labor force growth (annual entry to

the labor market is equal to annual retirement). The equation now becomes Y'=

α K' + α +L. Rearranging we have Y'-L= α K' +α ----------------------------- (4)

If we differentiate with respect to K' we will get y'-l $=\alpha$, meaning output growth

is solely determined by the growth in technology (α).