FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH IN MALAWI: A TEST OF BI-CAUSALITY

Master of Arts (Economics) Thesis

BY

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DECLARATION

I hereby declare that this dissertation is my original work and that it has not been presented to any other University for any degree award. Work of others used in this study has been appropriately acknowledged.

Signature ……………………………….
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Date ………………………………….

CERTIFICATE OF APPROVAL

We declare that this thesis is from the student’s own work and effort and where he has used other sources of information, it has been acknowledged. This thesis is submitted with our approval.

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DEDICATION

To my parents John and Joyce Chauma, my sisters and brother. I could not ask for a better family if I were given the chance.

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ABSTRACT

This study examines the causal relationship between Foreign Direct Investment and economic growth in Malawi and how the two interact with trade openness and inflation. The study employs vector auto regression analysis method using time series annual data from 1970 to 2005.

The Granger causality tests and innovation accounting were used to investigate causal relationships among the variables. The results indicate the presence of granger causality running from economic growth to trade openness but not to FDI growth and inflation. FDI growth on the other hand was found to weakly Granger cause economic growth, trade openness and inflation. Variance decomposition analysis shows that in the long run economic growth influences all the variables significantly whereas FDI growth has a considerable impact on economic growth but not trade openness and inflation. The study further reveals that only economic growth matters in attracting FDI in the long run whereas inflation and trade openness do not make a significant contribution.

The results suggest the need to come up with other measures besides liberalising the trade regime and maintaining a stable macroeconomic environment to improve the business climate in Malawi in order to attract more foreign investors into the country who will contribute to economic growth. Furthermore, policy should be geared towards maximizing the positive effects that come along with FDI.

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BOP	Balance of Payments
EPZ	Export and Processing Zones
FD	Foreign Direct Investment
GDP	Gross Domestic Product
MIPA	Malawi Investment Promotion Agency
MNCs	Multinational Companies
SAP	Structural Adjustment Programme
SOE	State Owned Enterprise
TNCs	Transnational corporations
UNCTAD	United Nations Conference on Trade and Development

CHAPTER ONE

INTRODUCTION

1.1 Background

Foreign direct investment (FDI) is viewed as a stimulus to economic growth in developing countries owing to its perceived ability to provide solutions to major challenges to growth such as financial resources, technological and skill constraints (Mwilima, 2003). For purposes of this study, FDI is defined as investment made to acquire a lasting management interest (normally at least 10% of voting stock) in an enterprise operating outside the economy of the investor (UNCTAD, 2006). Such investment can come in the form of either green field investment or merger and acquisition (M&A) depending on whether it is an investment in new assets or a transfer from local to foreign firms respectively.

A number of models have attempted to explain the determinants of economic growth. According to the post Keynesian Harrod Domar model for economic growth which postulates that economic growth is positively correlated to saving and inversely correlated to capital-output ratio, an increase in the level of savings will result in an increase in the output level (Todaro, 2006). Therefore, the inflow of foreign capital will increase the level of domestic capital stock and consequently contribute to growth in the output level of an economy. In addition to the direct effect of increasing the domestic capital stock, foreign capital inflow is said to have positive benefits on the host country in terms of facilitating the transfer of technology. Technology upgrading is crucial for an economy to improve on the quality and efficiency in its production by reducing the capital – output ratio. It has been argued that technical inefficiency is one of the factors behind the failure of developing countries to penetrate world markets (Mwilima, 2003).

Besides technology transfer, there are other channels through which FDI is said to benefit the host country. Trans-national companies (TNCs) are perceived to transfer superior managerial, administrative and marketing skills to local investors when they set up new plants or establish links with local subcontractors, create jobs[1], generate tax revenue and improve the current account of the Balance of Payments (BOP) through increased exports as a result of increased capacity and competitiveness in domestic production (UNCTAD, 2000). Domestic firms also tend to benefit indirectly from FDI through spillovers in form of transfer of superior technology, turnover of skilled labour, forward and backward linkages and increased market size through links established with TNCs.

However, despite all the benefits said to be stemming from FDI, some argue that foreign capital inflows may be detrimental to the host country. Jenkins et al. (2002) explain that multinational companies (MNCs) are more likely to repatriate profits back to their home countries and unlikely to establish linkages with local firms. Owing to liberal tax concessions, excessive investment allowances awarded to foreign companies by the host governments, the contribution of FDI to government revenue tends to be less than optimal. Furthermore, MNCs are likely to use capital intensive technology leading to lay-off of workers. More importantly, they may stifle local entrepreneurship, innovativeness and crowd out investment through mergers and acquisitions through the use of superior technology and skills against which local investors fail to compete.

In spite of the disagreement on the role played by foreign investment, policy makers in developing countries have turned to FDI as the alternative or supplementary element to the existing development strategies. For Sub-Saharan region alone, inflows of FDI have increased by 23% since the 1980s to date. The picture is similar for Malawi, where despite fluctuations the trend has been upward with a record of 2% increase from the 1990s to 2000s. However, although the flow of FDI to Africa has increased, Africa's share in world FDI inflows has declined from 2.3% in the 1980s to about 1.8% between 2000 and 2003(UNCTAD, various issues).

[1] Aaron 1999, in Jetkins et al indicates that in 1997 FDI was likely responsible for the creation of 26 million jobs in developing countries.

Malawi has experienced fluctuations in its economic growth over the years and has recorded negative growth rates in some years. Being an agro-based economy that is heavily reliant on rain fed agriculture, the country's GDP is highly responsive to climatic conditions. Between 1970 and 1980, the economy of Malawi grew at an annual average of 4.6%. However, the economy went into recession in the 1980s as the average annual growth rate was recorded at 0.8%. The economy picked up between 1990 and 2000 and grew at an average of 4.16%. The economic performance of Malawi is comparable to that of Sub-Saharan African countries that recorded an average annual growth rate of 1.9% between 1975 and 1984, 3.3% between 1985 and 1989 and 2.2% between 1990 and 2001 (World Development Indicators, 2005).

While the increase in FDI flows to African countries is indisputable, it still remains unclear as to whether there exists a causal relationship running from FDI to economic growth. The impact of FDI on host economies remains one of the most important questions in the international economics literature, faced with renewed interest in recent years (Obwona, 2002). Theoretical analyses have provided interesting and testable propositions valid under certain conditions and pointing towards a positive overall FDI effect. However, empirical analyses have produced varying results.

Nevertheless, it is generally believed that FDI provides positive benefits to the host country. As such many countries have come up with a range of incentives aimed at attracting foreign investors. To make the private sector more vibrant, the Malawi government has come up with a number of policy measures. For instance, the passing of the Malawi Investment Promotion Act of 1991 saw the establishment of the Malawi Investment Promotion Agency (MIPA) whose main objective is to promote, attract and facilitate both local and foreign investment. MIPA acts as Malawi's "one-stop-shop" for investors to access both general and export incentives including export processing zones (EPZs) status. Furthermore, the government has put in place measures like fiscal incentives which include competitive corporate tax rate of 50%, no withholding tax on dividends and duty free importation of raw materials for manufacturing among others

(MIPA, 1994). The government has also made huge investments in infrastructure to facilitate the operation of businesses.

1.2 Statement of the Problem

With regard to the positive effects perceived to come along with FDI, policy makers in Malawi like in most developing countries have over the years tried to come up with the best measures to attract foreign investors. Incentives have included tax exemptions as well as removal of restriction on repatriation of profits. This could be more on the disadvantage side because the government loses out on revenue and reinvestment may be minimal. Saiwa (2000) found out that inflows of FDI to Malawi do not augment the domestic capital stock but tend to displace local capital formation. Consequently, this would have adverse effects on economic growth. However, there are other channels through which FDI impacts on economic growth like creation of employment and transfer of technology which may offset the negative impact on domestic capital formation. It is in this regard that this study seeks to find out the causal relationship between FDI flows to Malawi and the country's economic growth so as to justify the costs of activities undertaken by the government in an attempt to attract foreign capital and achieve private sector led growth.

1.3 Objectives of the Study

The primary objective of this study is to examine the relationship between FDI inflows and economic growth in Malawi. The specific objectives of this study are as follows:

- To find out if growth in FDI causes GDP growth
- To find out if GDP growth influences growth of FDI inflows
- To find out the magnitude of the response in the growth of FDI and GDP due to a unit perturbation in both variables.

1.4 Test Hypotheses

- FDI growth does not cause growth rate of GDP.

- GDP growth does not influence FDI growth.

1.5 Significance of the Study

The government of Malawi recognizes the role of the private sector as an engine for economic growth. In this view, policies have been formulated to create an enabling environment to both domestic and foreign investors. In the Malawi Growth and Development Strategy, the need to create an enabling environment for attracting FDI has been highlighted in an effort to stimulate private sector driven growth and poverty reduction (MGDS 2006).

The findings of this study will therefore give a clear picture of the relationship between FDI and Malawi's economic growth and provide information that will be relevant for policy formulation regarding both economic growth and FDI so as to maximize the positive effects that come with foreign capital inflows. Furthermore, the study will contribute to existing literature by providing new empirical evidence on the effects of FDI on economic growth in Malawi.

1.6 Organization of the Study

The rest of the paper is organized as follows; chapter two gives a general overview of the economy of Malawi with more emphasis on FDI and GDP trends. Chapter three looks at the underpinning theoretical literature on FDI and economic growth. It also provides empirical literature based on some studies done on this subject. Chapter four is devoted to the presentation of the method of estimation to be employed in the analysis of this study. Estimation results and their empirical interpretation will be presented in chapter five. Lastly, chapter six gives a summary conclusion on findings and policy recommendations.

CHAPTER TWO

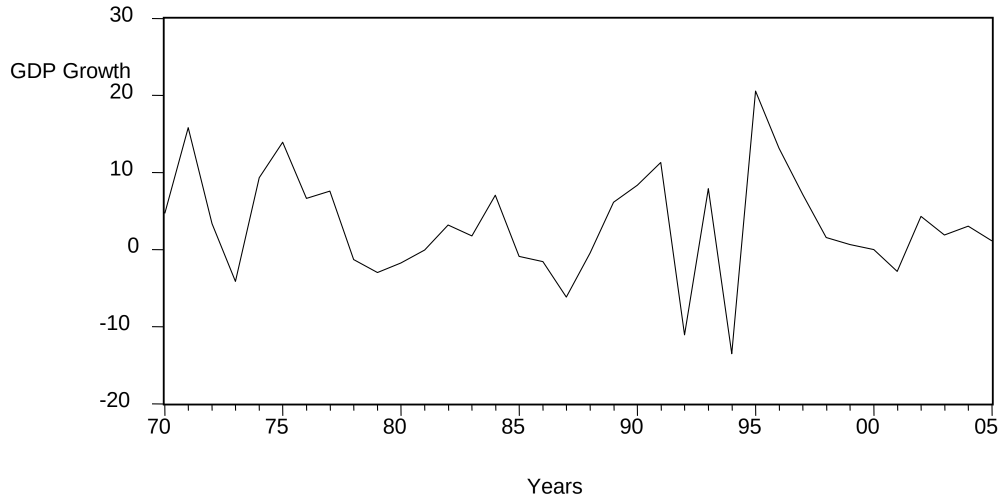
INVESTMENT CLIMATE IN MALAWI AND TRENDS IN FDI AND GDP

2.1 Trends in Gross Domestic Product (GDP) Growth

Malawi has experienced fluctuating trends in its economic growth since it got its independence owing to both internal and external shocks. The economy is agro based and agriculture accounts for about 40% of total GDP and 80% of exports. The heavy reliance on agriculture renders the economy susceptible to external shocks like unfavourable weather and declining terms of trade.

As shown in figure 1, the growth trend in Malawi's gross domestic product has been very erratic. Prior to 1979 the country recorded high economic growth rate driven by tobacco and tea exports. In 1974 there was a dip in the economic performance following the oil shock of 1974. GDP growth rate fell from 9.7% in 1978 to 4.3% in 1979 which could be attributed to the 1978 oil shock. Due to the Mozambican civil war in the 1980s, the Nacala and Beira ports were closed which had negative repercussions on Malawi's economy. The slump between 1991 and 1994 can among other things be attributed to the severe drought in 1991, aid withdrawal due to human rights violations perpetrated by the one party regime and the sudden liberalization of the economy. The transition from dictatorship to democracy saw the resumption of aid and goodwill which contributed to the positive growth. Since then, mismanagement of public funds and corruption have affected economic growth in a negative way.

Figure 1: GDP Growth Rate in Malawi



Source: compiled by the author using data from RBM

2.2 Investment Climate in Malawi

Prior to the implementation of structural adjustment programs in Malawi in the early 1980s, the government was the major investor in the economy. In 1973 public investment accounted for 62% of total domestic investment and by 1981 the level had gone up to 73% (RBM Financial and Economic Reviews; various issues). The investment climate was not favourable to private investors.

To promote domestic and foreign investment the Malawi government has over the years implemented economic reforms under the SAPs which have resulted in the liberalization of regulations that stifled investment. For instance price decontrols liberalization of financial markets and liberalization of the exchange rate and privatization of state owned enterprises among others.

Malawi has put in place a generous incentive package for foreign investors. This includes the corporate taxation policy and the special taxation for export oriented manufacturers (UNCTAD, 2006). The Investment Promotion Act of 1981 cut out the need for general investment licenses and provides an enabling investment climate to both foreign and domestic investors in Malawi. This is facilitated through the Malawi Investment Promotion Agency (MIPA), whose main objectives are to attract, encourage and promote local and foreign investment in Malawi.

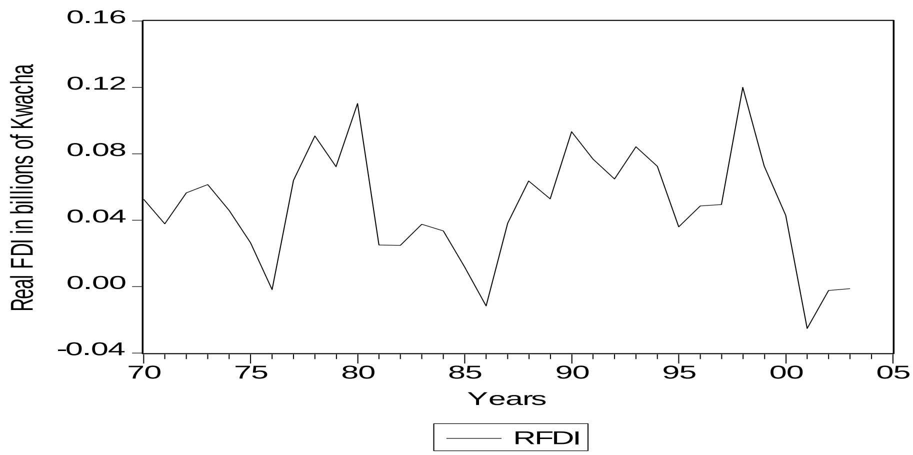
Legislation for the establishment of Export Processing Zones in Malawi came into force in 1995. All companies that exclusively produce for export may apply for EPZ status. Incentives offered under EPZs apply equally to both foreign and local investors and these include various tax incentives, transport allowances and import duty exemptions. A manufacturing under bond scheme (MUB) offers slightly less incentives to companies that export some but not all of their products.

Privatization has also contributed to the growth of the private sector in Malawi. The Malawi Privatisaton Act was passed in 1996. Since 1984, over 46 state owned enterprises (SOEs) from different sectors of the economy have so far been privatized to both local and foreign investors. The program is expected to involve some 150 SOEs or their subsidiaries (Privatisation Commission; 2006). This will boost local private investment as well as attract foreign investors to Malawi.

2.3 Trends in Foreign Direct Investment Flows to Malawi

Figure 2.2 below depicts the flows of real FDI into Malawi. As shown in the graph there has not been a particular trend in the flow but fluctuations. FDI inflows fell drastically from 0.06 billion kwacha in 1973 to about 0 billion in 1976. The downward trend was reversed in the subsequent years and 1980 recorded the highest level of FDI inflows at 0.1 billion kwacha. The upward trend in FDI inflow from 1986 to 1990 could be attributed to the liberalisation of trade regime, exchange rate and interest rate. In the late 1990s FDI recorded a decline and this could among other things be due to instability in the macroeconomic environment. For instance the Malawi kwacha exchange rate to the US dollar jumped from 15.32 in1996 to 44.09 in 1999 (RBM statistics). The lowest record of FDI was at -0.025 billion kwacha in 2001. Flows of real FDI to Malawi have averaged 0.04 billion kwacha for the period between 1970 and 2003.

Fig. 2: Real FDI Flows to Malawi

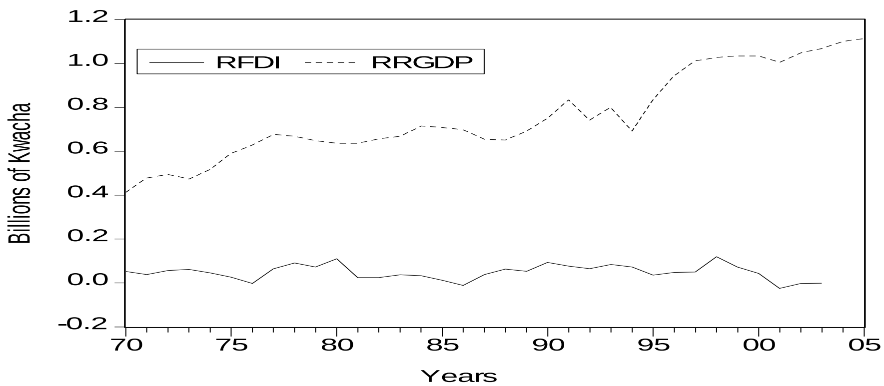


Source: compiled by the author using data from RBM

2.4 Relationship between Economic Growth and Real FDI Flows

In figure 3, real GDP is plotted in the graph with real FDI inflows to Malawi to see if there exists any relationship in the trends of the two variables. It is evident from the graph that there is a general upward trend in real GDP whereas real FDI shows no trend. However, FDI appears to respond weakly to GDP growth with a lag. For instance the drop in the level of GDP in 1973 was followed by a decline in FDI flows starting from 1975. The economy picked up in 1975 and FDI net inflows registered positive growth in 1976. When the economy went into recession in 1994, FDI inflows registered a decline in 1995. It is however difficult to tell whether it is economic growth that is preceding FDI or vice versa. Furthermore, changes in either of the variables cannot just be attributed to changes in the other variable without conducting an empirical investigation.

Figure 3: Real GDP versus Real FDI in Malawi



Source: compiled by the author

2.5 Geographical Distribution of Foreign Direct Investors in Malawi

The United Kingdom (UK) accounted for the largest part of both FDI flows and stocks in Malawi from the late 1980s to early 2000s. In 1988 and 1993, more than 90% of Malawi's total FDI stock was from the UK. In terms of flows the UK was also the largest source of FDI inflows to Malawi accounting for 88% of the average annual flows during 1991 to 1993. However, between 1994 and 1998, there was a significant decline in the level of FDI inflows from the UK which could be attributed to the post-cold war era that saw the western countries reduce their investments to African countries. Other significant sources include U.S.A, Norway, Ireland, France, china and Korea (Saiwa, 2000).

At intra regional level, South Africa has been the major foreign investor since the late 1990s with quite a number of investments in the financial and trading type of businesses. Mauritius and Zimbabwe have also invested in Malawi in the past although they accounted for only about 2% of total FDI (refer to Table 1 below).

Table 1: Foreign Direct Equity Investment stocks in Malawi by source

	Dec 31 1999		Dec 31 2000	
Source	(In US $Million)	As Percentage of Total	(In US$ Million)	As percentage of Total
United Kingdom	83.3	34.0	60.2	31.9
U.S.A.	56.0	22.8	50.2	26.6
Republic of South Africa	57.2	23.4	35.8	19.0
Norway	8.6	3.5	10.6	5.6
Ireland	3.2	1.3	6.2	3.3
Switzerland	5.9	2.4	3.6	1.9
Netherlands	6.4	2.6	3.5	1.8
Isle of Man	3.9	1.6	2.5	1.3
Mauritius	3.7	1.5	2.1	1.1
Zimbabwe	2.9	1.2	2.1	1.1
Other	13.9	5.7	11.8	6.3
Total	245.1	100.0	188.7	100.0

Source: UNCTAD, FDI/TNC database

2.6 Sectoral Distribution of FDI in Malawi

Table 2 shows sectoral breakdown of FDI inflows to Malawi. The service sector accounted for the largest share of FDI inflows into the country. In this sector, the telecommunications industry alone accounted for 30% of the total FDI inflows during this period. The reason behind this was the coming in of the Celtel Company from Kuwait. The trading accounted for the second largest share with more investors from South Africa, for instance PEP, Shoprite and Game stores. Since FDI in Malawi is more concentrated in the services and trading sectors than the manufacturing sector, it is less likely to establish linkages with local investors. Therefore, the positive effects said to emanate from FDI do not sufficiently spillover to local investors.

Table 2: Largest affiliates of foreign TNCs in Malawi, 2000`s

Company	Home economy	Industry
A. Industrial		
Illovo Sugar Malawi	South Africa	Agriculture
Transglobe Produce Exports	Mali	Food Products, beverages and Tobacco
Valmore paints	United Kingdom	Chemicals and Chemical Products
Limbe leaf Tobacco co. Ltd.	U.S.A.	Food Products, beverages & Tobacco
Mandala	United King	Chemicals and Chemical Products
Bata Shoe Company	Canada	Leather and Leather products
B. Tertiary		
CFAO Malawi Limited	France	Wholesale trade
Metro Cash & Carry Malawi	Germany	Distributive trade
CELTEL Malawi Limited	Kuwait	Telecommunications
Gestetner	Japan	Wholesale trade
Alexander Frobes Malawi limited	South Africa	Other business activities
Continental Discount House Limited	Mauritius	Other business activities
The Cold Chain	Zimbabwe	Wholesale trade
Lipton Tea	United Kingdom	Wholesale trade
Hertz Corporation	U.S.A	Automotive Trade and repair
Macmillan Malawi Limited	Germany	Education
Maersk Malawi Limited	Denmark	Other services
Portland Malawi	France	Other services
Price water house coopers	U.S.A	Other services
Sara Lee Corporation	U.S.A	Construction
Xerographics	U.S.A.	Wholesale trade
PEP chain stores	South Africa	Distributive trade
Shoprite	South Africa	Distributive trade
Game	South Africa	Distributive trade
C. Finance and Insurance		
Commercial Bank	South Africa	Finance
AON Malawi Ltd.	United States	Insurance
Loita Investment Bank	South Africa	Finance

Source: UNCTAD WID Country Profile: Malawi and MIPA

CHAPTER THREE

LITERATURE REVIEW

3.1 Theoretical literature

The theoretical concept focuses on how FDI is incorporated as an economic growth enhancer in growth theories. The vast literature on economic growth falls into three broad groups; the early post Keynesian growth models which emphasized the role of savings and investment in promoting growth (the Harrod – Domar and its variants), the neo-classical models which emphasized technical progress (the Solow model and its variants) and the more recent endogenous models which emphasize on research and development, human capital development and externalities (Romer 1990; Todaro, 2006).

3.2 The Post Keynesian Growth Models

3.2.1 The Harrod-Domar Growth Model

The Harrod (1939) – Domar (1946) growth model emphasizes on the role of savings in the economic growth of any country. As postulated in equation 3.1 below; the H-D model assumes a direct relationship between an economy's savings rate and its rate of output growth and an inverse relationship between capital-output ratio and economic growth.

$$\Delta Y / Y = s / k \qquad \dots (3.1)$$

Where Y is total output; ΔY is change in total output; s is savings ratio and k is capital output ratio. In view of this, the gap between the actual level of savings and the desired level to achieve a targeted economic growth rate can be filled by foreign financial resources among which is FDI. Therefore, foreign capital inflow is perceived to be making a positive contribution to the economic growth of the host country. However, this perception is based on the assumption that foreign investors will not borrow from the financial market of the host country to finance their investment. If this assumption does not hold, FDI may crowd out domestic investment through rising interest rates and thereby having an indirect adverse effect on growth.

Another interesting argument in favour of FDI from the H-D model is that given a fixed savings rate, a country can still realize growth through efficiency which reduces the capital-output ratio. Technological advancement is one way of achieving technical efficiency and FDI provides a channel of transferring technology from the developed to the developing countries.

3.2.2 The Two Gap Model

The two gap model is an extension to the H-D model. Apart from the domestic savings gap identified by the H-D model, the proponents of the two gap model, Chenery and Strout (1966) identified another gap; the foreign exchange gap or import purchasing power gap. The level of exports plus capital transfers determines the import purchasing capacity of an economy. The model is given as;

$$g = s/k + b/k \qquad \ldots (3.2)$$

Where g is economic growth; s is savings ratio and b is foreign exchange requirement. The argument is that foreign exchange in developing countries is not enough to finance imports of capital goods needed for production. Therefore, FDI fills the gap between targeted foreign exchange requirements and the actual foreign exchange derived from net exports and foreign aid inflows. Inflows of foreign capital will reduce the deficit on the balance of payments current account in the short run. In the long run, if the foreign owned enterprises are producing tradable goods, then they will improve the BOP balance by generating a net positive flow of export earnings (Chenery and Strout, 1966).

On the contrary, if the recipient country has a small financial market, large inflows may lead to exchange rate appreciation which may render the country's exports less competitive on the international market which may discourage export oriented FDI.

3.3 The Neo- Classical Growth Theory

According to the Solow (1956) traditional neo-classical growth theory which is extension to the Harrod – Domar growth model, growth in output results from one or more of these three factors; increases in labour quantity and quality (through population growth and education respectively), increases in capital (through savings and investment) and technological change. According to Todaro (2006), open economies grow faster and tend to converge at higher income levels than closed economies because of capital inflows from developed countries where capital-labour ratios are higher to developing countries with lower capital-labour ratios hence higher returns on investments. As a result, restricting inflow of FDI in LDCs will tend to hinder economic growth.

The Solow growth model emanates from a specific production function which relates growth in the level of output to two sources; inputs and factor productivity.

$$Y = K^{\alpha}(AL)^{1-\alpha} \qquad \ldots (3.3)$$

Where Y is output level; A is labour productivity; K is capital (both physical and human), L is labour; α is the elasticity of output with respect to capital and 1-α is the elasticity of output with respect to labour. Assuming constant returns to scale, the above equation can be transformed into a specific link between input growth and output growth which relates to the celebrated Solow growth model. The growth accounting equation is given as;

$$\Delta Y / Y = \alpha(\Delta K / K) + (1-\alpha)(\Delta A / A + \Delta L / L) \qquad \ldots (3.4)$$

Given the proportional growth rates of output, capital and labour, it is possible to calculate the growth in factor productivity, which is referred to as the Solow residual (the unobserved factors contributing to economic growth besides the two factors of production; labour and capital). There are a number of factors that can lead to increased factor productivity like the efficiency of government regulation, degree of monopoly in the market, technological progress and quality of the human capital. Since α is assumed to be less than 1, the model yields diminishing returns to both capital and labour. FDI therefore is said to contribute to increased factor productivity through technological advancement and improvement in human capital development through skill transfer.

3.4 The New Growth Theory

The Neo- classical growth theory does not explain the sources of long term economic growth which has resulted in dissatisfaction with the Traditional growth theory. The Solow growth model identifies technological progress as a determinant of growth, however it leaves unexplained as to what determines technological advancement. This has led to the development of the New growth theory, also referred to as the Endogenous growth theory as it tries to endogenise growth.

An important aspect of the endogenous growth theory is that it assumes a production function with constant marginal product of capital which implies continued long term growth unlike the neo classical assumption of diminishing marginal product of capital. Another important aspect of endogenous growth models is their contribution in explaining international capital flows between developed and developing economies (Todaro, 2006).

3.4.1 The Romer Growth Model

The Romer (1990) model is particularly relevant to developing countries because it incorporates spillovers that are often relevant in industrialization process. The model makes the assumption that growth originates from the firm or industry level and that each industry has constant returns to scale hence not violating the assumption of perfect competition. The model further assumes that the economy wide capital stock (both physical and human) has a positive effect on output at the industry level; therefore, there is a possibility of increasing returns to scale at the economy level. Each firm has a stock of knowledge which has spillover effects and externalities on other firms in the economy. Equations 3.4 through 3.6 show a simplified version of the model of R&D and growth developed by Romer (1990).

$$Y = AK^{\alpha} L^{1-\alpha} K^{\beta} \qquad \ldots (3.4)$$

There are two sectors in the economy; a goods sector and an R&D sector. A is stock of knowledge, K is capital, L is labour. K and A are the exogenous factors in the model. The exponents are not restricted to 1. A is a public good therefore; both sectors use the full stock of A. For simplicity symmetry across firms is assumed, implying identical levels of capital and labour. Thus the aggregate production function is given as follows;

$$Y = AK^{\alpha+\beta} L^{1-\alpha} \qquad \ldots (3.5)$$

After some manipulations of equation 3.5, the model reduces to 3.6 which gives the per capita growth rate in the economy.

$$g - n = \beta n / 1 - \alpha - \beta \qquad \ldots (3.6)$$

Where g is output growth rate and n is population growth. In the Solow model, there are constant returns to scale (β =0), thus the growth per capita in the long run would be zero. On the contrary, Romer assumes β >0 hence $g - n$ >0 and Y / L is increasing. In sum, externalities, human capital and R&D form the main springs of endogenous growth theory.

The factors identified to promote growth in the New growth theory can be promoted through FDI. FDI is recognised as the main channel of transferring technology, technical and administrative know how to developing countries unlike the other forms of foreign capital like portfolio investment and aid. Externalities and spillover effects have also been recognized as major benefits accruing to host countries from FDI. Balasubramanyam et al. (1996) argues that owing to the relatively low endowment of human capital, developing countries are constrained from undertaking investment in R&D which would result in the generation of new knowledge and its spillovers. This disparity explains the reason why developed countries tend to export skill-intensive goods whereas the developing countries export less skill-intensive goods. FDI can provide a long term solution to the existing skill gap through knowledge transfer. The knowledge and technology owned by MNCs could spillover to the domestic firms through training of labour and local management and also through links between foreign firms and local suppliers. Furthermore, in an attempt to keep up with foreign owned firms, local firms will be compelled to invest in innovation. This will in turn compel foreign firms to bring in superior technology and know-how.

Therefore, New growth theory provides powerful support for the thesis that FDI could contribute positively to economic growth (Balasubramanyam et al. 1996). However, in order to fully exploit the benefits emanating from FDI, there is a minimum threshold of absorptive capacity that the host country must have which includes degree of complementarity between FDI and domestic investment, an outward oriented trade regime, level of human capital development and other country specific characteristics (Borensztein et al, 1998).

3.5 Empirical Evidence

Empirically, the impact of FDI on economic growth remains ambiguous. Different studies have produced conflicting results on the subject. Carkovic and Levine (2005) argue that the benefits of FDI on the host country will depend on the absorptive capacity of the recipient country which is determined by social, economic and political factors. A number of studies discussed below have verified this argument[2]. Others have argued that

[2] Balasubramanyan et al (1996) found out that trade openness is crucial in unleashing the positive effects that come with FDI. Alfaro (2003) found out that FDI contributes positively to economic growth for those countries with well developed financial markets. Blomstrom et al (1994) discovered that it is the wealth of a nation that matters and not educational levels of the workforce that allows it absorb the positive effects of FDI, whereas in Borensztein (1998) study, education plays a crucial role.

the impact of FDI might vary across countries because of different stages of development (Obwona, 2002).

Balasubramanyam et al. (1996) argue that the impact of foreign capital on economic growth will depend on the host country's trade orientation. Using the World Bank's categorization of countries in terms of trade strategies, it was found out that the output elasticity of foreign capital was 1.83 and significantly different from zero in those countries following an export promotion strategy. For those countries with an import substitution trade regime the output elasticity was 1.77 but not significant. Trade liberalization is likely to promote allocative efficiency by re-orienting factors of production to those sectors in which a country has a comparative advantage in trade. It would also achieve technical efficiency by allowing for a choice of techniques of production which reflect the factor endowment of the economy. This supports the Post Keynesian Two Gap model as discussed in the preceding section in that the foreign exchange gap will easily be filled by foreign investors in those countries with an outward trade orientation.

Borensztein et al (1998) studied the role of FDI flows from industrialized countries to 69 developing countries in a framework of cross country regressions. The results revealed that FDI has a positive significant impact on economic growth and its contribution is greater than that of domestic investment, on which FDI has a crowding in effect. The study further revealed that there exists complementary effect between human capital and FDI, that is, human capital enhances the absorptive capacity of the host country to accommodate FDI and make it more effective as highlited in the Romer model that human capital is needed for research and development which is necessary for growth. It was found that countries in the group with the highest human capital (measured by educational attainment) grew at an average rate of 4.3% as compared to those countries with the lowest human capital that grew at 0.64%.

The view that the level of educational attainment of the labour force is positively related to economic growth is supported by Blomsrtöm et al (1992) in their study on 73 developing countries and 23 developed countries for the period between 1960 and 1985. The study further reveals that the positive effect of FDI on economic growth is positively correlated to the initial level of development of the host country as the coefficient for FDI in the regression equation was 0.5 for high income countries while that of low income countries was 0.1.

Lumbila (2000) used a panel analysis approach to assess the impact of FDI on the growth of 47 African countries and went on to identify factors that may hinder or enhance the effectiveness of foreign capital inflows. A Seemingly Unrelated (SUR) least squares estimation technique revealed that there exists a positive relationship between economic growth and FDI after controlling for the other growth enhancing factors. Furthermore, it was found that foreign aid and domestic investment make a far greater contribution to economic growth when compared to FDI. This could be attributed to the small portion of FDI directed to Africa.

To assess the impact of macroeconomic stability on FDI effectiveness, he divided the sample into two pools (moderate and low inflation). The results show that macroeconomic stability plays a role in unleashing the benefits of foreign investment. A similar approach was employed to assess the role of education, infrastructure, risk and corruption. It was found out that high levels of education, better infrastructure and lower risk enhance the spillover effects of FDI whereas corruption has no significant negative impact.

Choe (2003) used a VAR panel approach to examine the causality of FDI, Gross Domestic Investment (GDI) and economic growth. The line of argument was that FDI and GDI contribute to economic growth through capital accumulation. The Granger causality test results for a sample of 80 countries comprising high income OECD countries and developing countries over the period between 1971 and 1995 show that overall causality of FDI and GDI is bidirectional but more significant causality is from GDP to FDI than from FDI to GDP.

The effects of FDI on economic growth vary according to sector of allocation as revealed in a study by Alfaro(2003). The panel data analysis comprising 47 OECD countries over an observation period of nineteen years suggests that the overall effect of FDI on economic growth will depend on sectoral allocation. Investment in different sectors exerts different effects on the economy. Whereas the impact of FDI in the primary sector turns out to be negative, it appears to be positive in the manufacturing sector. Given their nature, agriculture and mining have little spillover potential for the host economy as compared to the manufacturing sector which has more inter-linkages.

Mauritius is one of the fastest growing developing economies. Blin and Outarra (2002) conducted a study to find out whether FDI enhances economic growth in Mauritius. They employed the autoregressive distributed lag bounds approach to cointegration using time series data for the period 1975-2001. The results indicate that FDI has a positive stimulating effect on economic growth. Human capital and private investment which were included as determining factors of growth have a positive significant impact. However, contrary to expectations, the regression results show that openness and public investment do not make any significant contribution to economic growth in Mauritius.

A number of studies support the view that GDP influences FDI inflows into a country. Studies by Bende – Nabende (2002) in Sub-Saharan Africa, Faeth (2005) in Australia and Bevan and Estrin (2000) in transition economies in Europe revealed that GDP had a positive impact on FDI whereas Frimpong et al (2006) found no causality between FDI and GDP growth in Ghana except for the post SAP period in which FDI was found to cause GDP and Balamurali et al (2004) found bidirectional causality between FDI and economic growth in the Sri Lankan economy.

It is clear from this section that there is conflicting evidence regarding causality of FDI and economic growth. The heterogeneity in the findings could on one hand be attributed to different econometric methodologies that were used and on the other hand to the heterogeneity in the structure of the economies under study which determines their ability to benefit from FDI. It is therefore necessary to bear in mind these variations when examining the relationship between FDI and economic growth.

CHAPTER FOUR

METHODOLOGY

4.1 Model Specification

In view of the possible endogeneity between FDI and economic growth, the study employs a vector autoregressive analysis (VAR) approach to investigate the causal relationship between the variables. A similar approach was employed by Balamurali and Bogahawatte (2004) in their study on FDI and economic growth in Sri Lanka as discussed in the preceding chapter on literature review. The model that was used is shown below;

$$Y_{it} = \beta_i + \sum_{k}^{m} \left[\alpha_{ik} Y_{t-k} \right] + \varepsilon_i \qquad (4.1)$$

Where Y is a vector of four endogenous variables namely; gdp growth, trade openess, fdi and domestic investment. The VAR model to be used in this study is a slight modification of the model by Balamurali et al (2004) and is as specified below:

$$X_{it} = \beta_i + \sum_{k}^{m} \left[\alpha_{ik} X_{t-k} \right] + \varepsilon_i \qquad (4.2)$$

Where X is vector of endogenous variables (LNGDP, LNF, LNOPEN, LNCPI); m is maximum lag length; k is lag period; β_i is the vector of intercepts; i ranges from 1 to 4; ε_i is vector of error terms assumed to be white noise and t is subscript for time. The model has replaced domestic investment that was in the Balamurali (2004) model by CPI to capture macroeconomic stability which influences the amount of FDI inflows into a country and also growth of an economy. The domestic investment variable would not add much value to already existing literature because a study by Saiwa(2000) looks at impact of FDI on local capital formation.

4.2 Description and Measurement of Variables

This section gives description and measurement of each variable. It also explains the relationship among the variables.

LNGDP is the natural log of nominal gross domestic product measured in millions of kwacha. This is used to capture economic growth because the first differences of a natural log yield growth rate. The level of GDP is used as a measure of market size which is one of the factors that determine FDI flows to a country (Asiedu, 2003). A country's level of GDP has an impact on its degree of trade openness. The Mundell Flemming model[3] shows net exports as a function of a country's real income. An increase in the level of GDP results in reduction of unemployment and according to the Phillips Curve, there is a trade off between inflation and unemployment. Therefore, an increase in the level of GDP results in an increase in the price level.

LNF is the natural logarithm of net nominal inflows of foreign direct investment to Malawi measured in millions of kwacha as a ratio to GDP. FDI is recognized for its contribution to capital formation and spillover effects on technological progress and trade. According to a report by the World Bank (2002), several studies have concluded that FDI can promote the host country's economic development by improving on productivity growth and export hence increasing the degree of opennesss. Basing on the quantity theory approach to inflation[4] which says that in the long run, increases in the level of money supply are a necessary condition for increases in the price level and that the rate of growth in money supply uniquely determines the rate of inflation. Thus

[3] The Mundell-Fleming model looks at equilibrium in an open economy. The Real sector equilibrium is given as $Y=A(i,y)+x(r,y,n)+G$, money market equilibrium is given as $M/P=L(I,y)$, the BOP equilibrium is given as $B=x(r,y,n)+K(i)=0$ and $i = i^*$. Where; x is net exports; y is domestic real income; n is export shift parameter; r is the exchange rate; G is government expenditure; A is domestic absorption excluding government; M is the money supply; P is the price level; L is the real money demand; B is the balance of payments; K is capital inflows; i is domestic interest rate and i* is foreign interest rate. Dornbusch, R.(1980)

[4] The model for the quantity theory is given as: $Ms = kPY$; where Ms is money supply; P is price level; Y is real national income at full employment and k is a constant representing the proportion of income held as cash balances. Given that k and Y are constants, differentiating a logarithmic function of the equation with respect to time yields $d\ln Ms/dt = d\ln p/dt$.

foreign investors may increase the level of money supply and vis-a-vis the level of inflation.

LNOPEN is the natural logarithm of trade openness that is proxied by the sum of exports and imports as a ratio to GDP measured in millions of kwacha. Degree of openness captures policy breaks in the data. Trade contributes to economic growth through increased competition, realization of comparative advantage and access to new technology as well as managerial skills (Ayanalwe, 2003). Openess to trade will attract FDI because investors are assured of a large market for their products. The link from openness to inflation works through the exchange rate. According to Laviatan (1986), depreciation of the exchange rate increases the underlying rate of inflation through increases in inflationary expectations which are then accommodated by monetary authorities.

LNCPI is the natural logarithm of annual consumer price index calculated as the average of monthly CPI per year. The first differences will yield inflation which used to capture macroeconomic stability. A country with high inflation uncertainty will not attract foreign investment. A rise in the price level entails a rise in the cost of production which hinders economic growth. Sweidan (2004) argues that the negative impact of inflation on economic growth occurs after a structural break point, below which the impact tends to be insignificant. The structural point varies across countries. Rogoff (1985b) explains that an unanticipated expansionary monetary policy will cause the exchange rate to depreciate and this has repercussions on the openness of an economy. If the country in question is a net exporter, the depreciation will improve openness where as for a net importer openness will worsen.

4.3 Data Source

The study uses time series data ranging from 1970 to 2005. The data on GDP, OPEN and CPI variables was collected from monthly and annual statistical bulletins of the National

Statistical Office of Malawi and that of FDI was collected from the Reserve Bank of Malawi.

4.4 The Vector Autoregression Analysis

One fundamental assumption of regression analysis is that the variables on the right hand side are predetermined or exogenous. If one or more of the variables are correlated with the error term, they are said to be endogenous and estimates obtained through OLS or WLS will be inconsistent and biased. One approach to dealing with endogeneity is using Vector Autoregression (VAR) Analysis. In a VAR model there is no distinction between variables as endogenous or exogenous, that is, all variables are treated as endogenous. The term autoregression arises from the appearance of lagged values of the dependent variable on the right hand side and the term vector arises from the fact that we are dealing with a vector of two or more variables (Gujarati, 2005).

4.4.1 Lag Length Determination

In a VAR model, lag length selection is critical. Long lag lengths consume degrees of freedom whereas a small lag length may render the model misspecified. The Akaike Information Criterion (AIC), Schwartz Bayesian Criterion (SBC) and the Log Likelihood Ratio (LR) are alternative methods used to determine the appropriate lag length. The LR tests based on the VAR models in the levels of the variables as shown below:

$$LR = T(\log|\sum_{RR}| - \log|\sum_{UR}|) \qquad \ldots \quad (4.3)$$

$$LR_s = T - c(\log|\sum_{RR}| - \log|\sum_{UR}|) \qquad \ldots \quad (4.4)$$

Where T is the number of usable observations, c is the number of estimated coefficients including the intercept in the unrestricted system, $\log|\sum_{RR}|\ and \log|\sum_{UR}|)$ are the logarithms of the determinants of the variance/covariance matrices of the residuals in the restricted and unrestricted VARs, respectively. Equation 4.2 is the standard LR statistic and 4.3 is the augmented LR statistic by Sims (1980). Both statistics follow a χ^2 distribution with degrees of freedom equal to the number of restrictions in the system. The null hypothesis is that the restriction is binding. If the calculated value of the statistic is less than the critical at a pre-specified significance level, we fail to reject the null hypothesis. The RR equation is turned into an UR equation and the test continues until the appropriate lag is established (Enders, 2004). For the AIC and SBC statistics, selection criterion is based on the model that yields the smallest value of the AIC and SBC statistics.

4.5 Time Series Properties

4.5.1 Stationarity

Definition

The estimation and hypothesis testing using time series data is based on the assumption that the variables are stationary or independent of time. A series is said to be stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the gap between the two time periods and not the actual time at which the covariance is computed (Gujarati, 2005). If they are not, the means, variances, and covariances of the time series will not be well defined. Therefore, the regression results will be spurious and the estimated coefficients will be biased.

Dickey Fuller (ADF) Test for Unit Root

The Dickey Fuller (ADF) test for unit root is one of the methods used to examine stationarity of the time series and also the order of integration of the variables.
According to Dickey and Fuller (1979) testing for stationarity is the same as testing for the presence of a unit root. As in the following equation:

$$Y_t = \alpha Y_{t-1} + \varepsilon_t$$

The null hypothesis is that α =1 and the alternative hypothesis is that α <1. If the null hypothesis is not rejected it follows that the series is non-stationary.

An extension to this test is the Augumented Dickey-Fuller test which includes extra lagged terms of the dependent variable in order to eliminate autocorrelation. The lag length could be determined by the lag length required to whiten the error term. Alternatively, it is determined by either the Akaike Information Criterion (AIC) or Schwartz Bayesian Criterion (SBC).

Co-integration

A series that is non-stationary is differenced successively to make it stationary. Order of integration is the number of times a series has to be differenced to make it stationary. For instance if a given variable is said to be integrated of order one, it implies that it was differenced once to make it stationary. Sometimes the linear combination of non-stationary series integrated of the same order can be stationary in levels in such a case we say that the series are co-integrated, that is, they have a long term relationship or equilibrium between them.

To test the hypothesis of co- integration, the study makes use of the Johansen Maximum Likelihood Method. If two variables are integrated of the same order individually but are found to be cointegrated implying that there exists a long run relationship between them, then there exists Granger causality between them. In order to establish short run dynamics between the regressand and the regressors, there is need to employ the Vector Error Correction (VEC) analysis. The underlying concept to the VEC is the adding of an Error Correction Term (ECT) lagged once, obtained from the cointegration relation to the model containing stationary variables. The ECT is calculated as follows:

$$ECT_t = \gamma + \beta_i \sum X_t$$

Where γ is the intercept of the cointegration equation and β_i is the coefficient of each variable. The coefficient of the ECT in the estimated VEC model reflects the process by which the dependent variable adjusts in the short-run to its long-run equilibrium path.

4.6 Granger Causality and Block Exogeneity Tests

The Granger representation theorem says that if two variables are individually non stationary and I(1), that is, integrated of order one and are found to be cointegrated then there must exist a unidirectional or bidirectional causality between them. Granger causality is used to see how much of the current y can be explained by past values of x and whether adding the number of lagged values could improve the explanation. Therefore, to test for causality, the variables in the VAR will first of all be tested for stationarity and cointegration. The number of lagged terms to be included in test is important because direction of causality is influenced by the number of lag terms included. The choice is done using the LR Test. In some cases, a variable x may not individually Granger cause y even though jointly with other variables it has a causal effect on y. To test for joint causality the study uses the Block exogeneity test. If the null hypothesis of joint causality is not rejected, then the dependent variable is suggested to be exogeous.

4.7 Innovation Accounting

The stochastic error terms are referred to as impulses or innovations in VARs. Innovation accounting is a tool used for forecasting in VAR models. It is done through impulse response function and variance decomposition analysis. The impulse response function traces out the effects of a unitary shock to an endogenous variable on the variables in the VAR system in the current as well as future periods whereas variance decomposition decomposes variation in an endogenous variable into the component shocks to the endogenous variables in the VAR. In other words, variance decomposition shows the relative importance of each random innovation to the variables in the VAR. To do such analysis the VAR model needs to be orthogonalised, that is, the errors in the system equations should be contemporaneously uncorrelated. In E-Views the Cholesky decomposition technically orthogonalizes the errors.

4.8 Diagnostic Tests

Since the VAR estimation analysis uses the OLS technique for each equation in the system, it is necessary to conduct the following tests to ensure that the OLS assumptions are met and the estimates are unbiased, efficient and consistent.

4.8.1 Autoregression (AR) or Serial Correlation (LM) Test

A common problem in using time series regressions is that the estimated residuals tend to be correlated across time. Serial correlation makes OLS estimates to have small standard errors that yield inefficient, biased and inconsistent estimates especially when lagged dependent variables are included on the right hand side of the test equation.

The Breusch-Godfrey serial correlation Lagrange Multiplier (LM) test is used to test for higher order autocorrelation among the errors and is applicable whether or not there are lagged dependent variables. The null hypothesis is that there is no serial correlation up to a pre-specified lag order against the alternative of the presence of serial correlation.

4.8.2 Autoregressive Conditional Heteroskedasticity (ARCH) Test

The ARCH test is a Lagrange Multiplier (LM) test used to test for conditional heteroskedasticity in the residuals. The test assesses whether the magnitude of past residuals are related to the magnitude of recent residuals. ARCH in itself does not invalidate standard OLS inference but ignoring ARCH effects may result in loss of efficiency (Eviews 5.1 help). The null hypothesis assumes that there are no ARCH effects up to some order q.

CHAPTER FIVE

ECONOMETRIC ESTIMATION AND INTERPRETATION

5.1 Stationarity Test Results

As discussed earlier it is necessary to establish stationarity of the variables in order to avoid spurious regression results. Graphical exposition of the four variables as shown in appendix 1 suggests that FDI and CPI are stationery in levels. However, when tested for stationarity using both the ADF and Philip Perron tests, it is evident from table 3 below that the variables are nonstationary in levels at both the 5% and 1% significance levels but they are stationary in their first differences. Implying that there was some non-stationarity in the FDI and CPI series that could not be detected by the simple graphical test. It has therefore been established that all the variables in the system are integrated of order 1.

Table 3 Unit Root Test Results

Variable	ADF Statistic (levels)	ADF Statistic (1st difference)	PP Test statistic (levels)	PP Test Statistic (1st difference)	Augumentation Structure	Order of integration
LNGDP (trend and intercept)	-1.527	-3.690*	-1.643	-3.750*	1	I(1)
LNFDI (intercept)	-2.593	-5.038**	-3.419	-7.104**	1	I(1)
LNOPEN (intercept)	-1.921	-5.601**	-2.310	-7.394**	1	I(1)
LNCPI (trend and intercept)	-2.128	-3.685*	1.676	-3.291*	1	I(1)

**(**) indicates significance at 5% (1%) level of significance*

The MacKinnon critical values at 5% are; -3.547(levels) and -3.551 (1st difference) for variables with intercept and trend; -2.948 (levels) and -2.954(1st difference) for variables with intercept only.

5.2 Lag Length Determination

To establish the optimal lag length for the VAR model, the study employed the Sim's LR test, AIC and SBC information criteria. The results are presented in Table 4 below. The SBC selection criterion selects the 1 lag order, the AIC selects a lag of order 4 whereas the Sim's likelihood ratio and the ordinary LR tests suggest that the lag should be of order 3. The study estimates a VAR of order 3 as opposed to that of lag 1 order because at lag of order 1 the residuals were serially correlated whereas the lag order of 4 was not opted for because of the small sample size at hand.

TABLE 4 Lag Length Test for a VAR

LAG	AIC	SBC	HYPOTHESES	LR	LRs
1	-8.6289	-7.7402	H0: k =1 ; H1: k = 2	26.7852***	19.695***
2	-9.0565	-7.4403	H0: k = 2; H1: k = 3	77.2365***	46.81***
3	-8.8338	-6.4757	H0: k = 3; H1: k = 4	-41.3984	-19.41
4	-9.7742	-6.6595			

*LR is the likelihood ratio test statistic under null hypotheses of restricted VAR models against alternatives of unrestricted VAR models. *** indicates rejection of the null hypothesis at 1%.*

5.3 Cointegration Test

Having established that the variables are I (1), a cointegration test using the Johansen Maximum Likelihood Method was conducted to confirm the existence of a long term equilibrium relationship among the variables. The results as shown In Table 5 below confirm that the variables are cointegrated, as the null hypothesis of no cointegration is rejected.

TABLE 5: Co-integration Test with Intercept (no trend) in CE and Test VAR

H0	H1	Eigenvalue	Likelihood Ratio	5 perecent critical value	1 percent critical value
r=0	r=1	0.753299	93.16999**	47.21	54.46
r≤1	r=2	0.633572	48.38349**	29.68	35.65
r≤2	r=3	0.351589	16.25701*	15.41	20.04
r≤3	r=4	0.072075	2.393752	3.76	6.65

** (**) denotes rejection of the null hypothesis at 5% (1%) significance level*

The LR test indicates 3 cointegrating equations which are given as below, the figures in parentheses are standard errors.

	LNGDP	LNFDI	LNCPI	LNOPEN	C
Equation 1	1	0	0	-1.098299	-6.425850
				(0.03434)	
Equation 2	0	1	0	-0.026050	-0.007769
				(0.03450)	
Equation 3	0	0	1	-0.294390	1.214021
				(0.26282)	

Three error correction terms were calculated from the normalized cointegrating relations to estimate a vector error correction model. A similar approach to the one used in determining the appropriate lag length for the unrestricted reduced form VAR was employed to determine the optimal lag length for the VECM. The SBC selected lag length of order 1 and AIC selected lag order of 4. The study estimated a VECM of order 2 selected by the ordinary log likelihood ratio and Sim’s likelihood ratio criteria which is consistent with the lag order of 3 in the unrestricted VAR model (E- Views 5.1 help notes). Lag order of 4 was not attractive in view of the sample size whereas at lag order of 1 the residuals were found to be seriously correlated (see Table 6 below).

TABLE 6 Lag Length Test for VECM

LAG	AIC	SBC	HYPOTHESES	LR	LRs
1	-8.475	-6.499	H0: k =1 ; H1: k = 2	20.5983**	27.4644**
2	-8.2971	-5.576	H0: k = 2; H1: k = 3	3.014	4.795
3	-9.199	-5.718	H0: k = 3; H1: k = 4		
4	-9.5638	-5.308			

*LR is the likelihood ratio test statistic under null hypotheses of restricted VEC models against alternatives of unrestricted VEC models. . ** indicates rejection of the null hypothesis at 1%.*

5.5 Diagnostic Tests Results

The Breusch-Godfrey LM test was used to test for autocorrelation of higher order in each one of the equations in the VEC model. The error terms in all the four equations were found to be serially uncorrelated (refer appendix 4). This implies that the standard errors are valid and therefore, the Granger causality tests results are efficient and unbiased. Serial correlation of higher order was also tested for the whole VEC model to see whether there is contemporaneous serial correlation of the error terms across equations. The LM – test statistics in appendix 3 show that there is neither first order nor third order serial correlation.

To test for the presence of autoregressive conditional heteroskedasticity, the study used the ARCH LM test. At the 10% level of significance, the null hypothesis that there is no ARCH up to order 2 in each individual equation in the VAR model was not rejected (see Appendix 4).

Appendix 2 shows the result of the test for normality of the residuals. The Urzua normality test is a multivariate extension of the Jarque-Bera residual normality test based on the third (skewness) and fourth (kurtosis) moments of the residuals compared to those of the normal distribution. As can be seen from table in appendix, skewness is not a problem but kurtosis. However, the joint p-value is 0.7841. Thus at 1% and 5% significance levels but we fail to reject the null hypothesis that the residuals have a normal distribution at 10% level of significance.

5.5 Granger Causality and Block Exogeneity Tests

The variables (in their logarithmic form) in the VEC model were tested for Granger causality to find out if there exists any causal relationship among the variables within the lag period of four years. The Block exogeneity test was conducted to investigate whether any of the variables assumed to be endogenous in the system was at least exogenous in the short run.

The t- statistics for the error correction terms in the last three rows of Table 7 appear to be individually significant in three out of the four equations. This indicates that the VEC model may have been correctly specified and that it is stable, which implies that the variables tend to converge to their state of equilibrium following a shock from any variable in the system.

The results presented in Table 7 below show that there is weak unilateral causality running from FDI to GDP growth as the null hypothesis of no causality is rejected at the 10% level of significance. The variables OPEN and CPI also appear to strongly Granger cause GDP. However, GDP growth has a causal effect on the variable OPEN only. This implies that GDP growth does not immediately impact on the other two variables, that is, inflation and FDI growth. An interesting finding that is contrary to expectations is that FDI growth appears to be exogenous in the short run as there is no causal relation running from any single variable to the variable FDI. Even jointly the variables do not cause FDI growth. However, there exist unilateral causal relations running from FDI to OPEN, CPI and GDP. As can be seen from the table below, the chi-squared Wald statistic for joint significance is highly significant in three out of the four equations in the system.

TABLE 7: Granger Causality and Block Exogeneity Tests

	ΔLNGDP	ΔLNFDI	ΔLNOPEN	ΔLNCPI
ΔLNGDP		0.7921	0.0479**	0.8138
ΔLNFDI	0.0827*		0.0669*	0.0899*
ΔLNOPEN	0.0000***	0.3569		0.0006***
ΔLNCPI	0.0016***	0.7726	0.0017***	
ALL	0.0000***	0.9053	0.0002***	0.0023***
ECT 1	-0.35803	-0.17778	-2.36060	0.86649
ECT2	0.81031	-2.28025	0.03219	1.36507
ECT3	0.52109	0.72656	-2.350038	1.8186

*Except for the last two rows, the figures show granger causality running from the row variables to the column variables. The figures are the Wald test statistics with a chi-distribution. *,**,and*** imply rejection of the null hypothesis of no granger causality at the 10%, 5% and 1% respectively. ECT 1, ECT2 and ECT 3 are t test statistics for the error correction* terms.

5.6 Innovation Accounting

5.6.1 Variance decomposition

Variance decompositions for all the variables in the system were generated over a forecasting horizon of 10 years. The results are presented in Table 8 below. Entries are the percentages of variation in the row variables due to the column variable. Firstly, FDI growth accounts for about 7% of the total variability in GDP growth whereas inflation accounts for only 2%. The finding that over 80% of the variability in GDP is due to its own innovations is inconsistent with the findings under Granger causality where there was causal relation running from all variables in the system to GDP growth.   This shows that the Granger causality dies off in the short run: in the long run, trade openness, inflation and FDI do not account for significant changes in GDP growth. Similary, (Kim,

2004) found that in the Asian newly industrialized countries[5], variance in GDP was mostly explained by its own shocks.

Secondly, GDP growth accounts for 48% of the total variation in FDI growth representing the largest percentage relative to the other variables. This implies that the exogeneity of FDI unveiled under Granger causality does not persist in the long run. However, a comparatively high proportion (47%) of FDI growth variability is due to FDI itself. Inflation and trade openness do not significantly account for variation in FDI. The finding that GDP significantly influences FDI is in line with the finding by Frimpong et al (2006) in their study on Ghana and Kim (2004).

Thirdly, a one standard deviation random shock to GDP growth accounts for about 70% of the prediction forecast error in openness, implying that the effects depicted under Granger causality test have long memory. This is consistent with the study's apriori expectations that exports from and imports into a country will depend on the country's level of GDP. Apart from GDP growth, it is trade openness that accounts for a greater proportion of its own prediction error. FDI growth accounts for only 10%. This could be attributed to the fact that a majority of the foreign investments in Malawi are not export oriented.

Fourthly, the forecast error prediction in inflation is greatly accounted for by a random shock in GDP growth which contributes about 87% to the total forecasting error prediction. This finding is contradictory to the short run findings under Granger causality and implies that the impact of GDP growth on inflation is felt in the long run. Second to GDP growth, it is FDI growth that has quite somewhat influence on the prediction error variance in inflation. As foreign investors flock into a country, they will bring with them foreign currency which when converted into local currency will tend to increase the amount of currency in circulation.

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[5] The Asian newly industrialized economies are Thailand, Malaysia, Phillipines and Singapore

In a nutshell, it is evident from the Table below that a unit random standard deviation shock to GDP growth plays a significant role in influencing inflation, FDI growth and trade openness in the long run. However, random shocks to all the other variables do not significantly influence the prediction error variance of GDP.

Table 8: Variance Decomposition

	ΔLNGDP	ΔLNFDI	ΔLNOPEN	ΔLNCPI
ΔLNGDP	89.61	7.49	0.61	2.30
ΔLNFDI	48.04	47.27	3.72	0.96
ΔLNOPEN	69.56	9.90	16.23	4.31
ΔLNCPI	87.4	10.63	0.42	1.52

5.6.2 Impulse Response Functions

Figure 5 depicts impulse responses of GDP growth to a standard deviation shock to all the variables under study. As can be seen from the graphs, the responses are generally converging towards zero except for shocks emanating from GDP growth itself and FDI growth which tend to persist over time.

The first graph in the second column of Figure 5 shows the time path of GDP growth in response to a one standard deviation shock to FDI. Initially GDP growth does not respond to the shock in FDI growth. However, after two years, GDP growth begins to register a positive elasticity to the shock in FDI. The positive elasticity does not die out even after 10 years. The accumulated elasticity of GDP growth to the shock in FDI growth in the tenth year is 0.8 (refer appendix 6). This finding could be attributed to the fact that the first few years after establishment, the foreign firms are still enjoying tax exemptions thus not contributing to tax revenue, further more, it would take some time before the spillover effects in terms of advanced technology and managerial skills are adapted by the local entrepreneurs.

The second graph in the first column of Figure 5 shows the response time path of GDP growth to a shock in trade openness. In the initial year, GDP does not respond to changes in the degree of trade openness as the basis point elasticity is zero. However, in the subsequent years it appears that GDP growth responds positively to a one standard deviation shock in trade openness. After 10 years, the accumulated response is still positive with an elasticity of 0.46.

The second graph in the second column of Figure 5 shows that in the first one year, GDP growth responds positively to a shock in inflation but thereafter the response is negative. This happens could happen if the inflation resulted from an unanticipated expansionary monetary policy which results in an increase in aggregate demand due to money illusion which fades with time as consumers adapt to the changes (Branson, 1989).

Figure 6 depicts the response time paths followed by FDI inflows to one standard deviation shocks in all the variables under study in the system. The first graph in the first column shows that FDI inflows respond positively to a shock in GDP growth. In the initial year of the shock, the response elasticity is 0.01. At the end of 10 years the accumulated response is also 0.01.

The second graph in the first column shows FDI response to a shock in trade openness. In the fist year, FDI inflows are literary unresponsive to the shock in trade openness. In the following three years, the response is negative. Thereafter, FDI growth responds positively to the shock in trade openness. The accumulated response at the end of 6 years when it has stabilized is 0.006 Although this is almost negligible, it is in line with the apriori expectation that the more open a trade regime is, the larger the amount of FDI inflows to that country.

The second graph in the second column of Figure 6 shows that a one standard deviation shock to inflation will impact negatively on the growth of FDI inflows to Malawi as expected but the impact is insignificant. The response appears to stabilize at the end of six years and the accumulated response is an elasticity of -0.003. It can be concluded that FDI inflows do not respond significantly or are unresponsive to shocks in trade openness and inflation and a little responsive to shocks in GDP. This is in line with the findings under variance decomposition where only GDP growth accounted for quite a significant proportion of the random variation in FDI growth.

Figure 4: Impulse Response of GDP

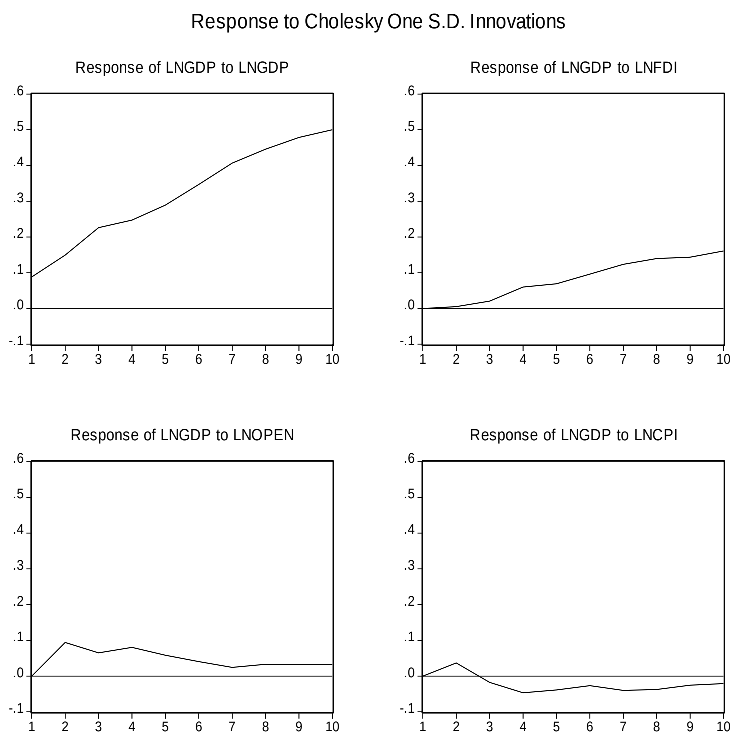
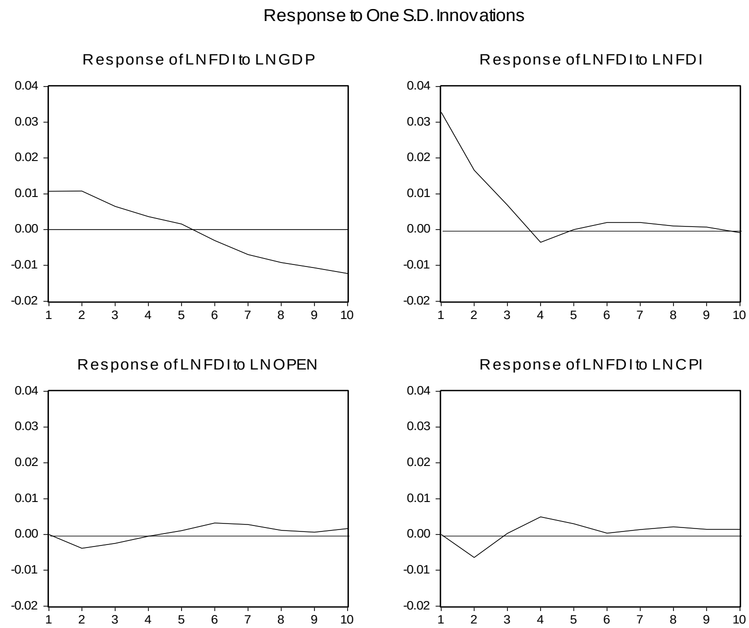


Figure 5: Impulse Response of FDI



CHAPTER SIX

CONCLUSION

6.1 Summary

The overall objective of this study was to empirically establish the relationship between FDI and GDP growth in Malawi using vector autoregression analysis in view of the argument that there exists bicausality between the two variables. The study period was from 1970 to 2005. Apart from FDI and GDP growth, the study incorporated two more variables that are theoretically known to relate closely with the two, namely; openness of the trade regime and rate of inflation

Time series properties were established before estimating the model to avoid spurious and inconsistent results. All the variables were found to be non-stationary in their levels but stationary in their first differences. After testing for cointegration using the Johansen test, the variables were found to contain three cointegrating relations. Therefore, a vector error correction model was estimated from which Granger causality tests, variance decompositions and impulse response functions were drawn.

Under Granger causality test it was revealed that GDP growth has a causal effect on trade openness but not on inflation and FDI growth. It was further revealed that FDI growth has a weak causal effect on the variables in the system, that is, GDP growth, degree of trade openness and inflation. The variance decomposition results give a picture of causality among the variables over a longer period of time unlike the Granger test that focuses on a shorter period. What has been drawn from the variance decomposition results is that the impact of FDI growth on all variables including GDP growth is not significant in the long run as was the case in the short run, whereas GDP growth significantly impacts on FDI growth in the long run and its effect does not die down even after 10 years as depicted in the impulse response graph.

6.2 Policy Recommendation

It has been found out that growth of FDI has a positive although not very significant impact on GDP growth. Borenzstein et al (1998) explain that the ability of a host country to reap the benefits of FDI will depend on its absorptive capability. For instance, Romer (1993) and Borenzstein et al (1998) found out that the interaction between FDI and human capital has a positive impact on economic growth. The finding that FDI weakly induces economic growth implies that policies aimed at attracting FDI need to be complemented by policies that will enhance the positive effects like investment in human capital development. It is evidenced in chapter two that FDI in Malawi is concentrated in the service and trading sectors. Therefore, efforts need to be made to attract FDI to key sectors with large inter-sectoral linkages. A study by Alfaro (2003) revealed that FDI spillover effects are highly realised in the manufacturing sector.

The study has further yielded very interesting results regarding FDI. Contrary to apriori expectations, openness to trade and macroeconomic stability do not have a significant impact on the levels of FDI flowing into the country. This can be supported by statistics which indicate that despite efforts made by the Malawi government to reduce trade barriers, FDI inflows have remained low (UNCTAD, 2005). FDI is constrained by shortcomings in the business environment like poor infrastructure, corruption, lack of skilled labour force and high cost of excessive bureaucratic procedures. Therefore, there is need to address the supply side constraints which when coupled with long term economic growth will provide an enabling environment to foreign investment. The Malawi government needs to direct resources towards improvement of the condition and network of roads. Malawi being a land locked country, sea access is costly. The on going Shire-Zambezi Waterway Project could address the problem of land lockedness by reducing transportation costs and consequently making Malawi attractive to foreign investors. Apart from transportation, other bottlenecks to investing in Malawi are water and electricity disruptions which result in underutilization of capacity and production inefficiencies. The proposal by government to import electricity from Mozambique may ease the problem.

6.3 Limitations and Areas for Further Study

A major limitation to this study was the use of annual data versus VAR or VEC methodologies which are typically data intensive. It is possible that different results would have been found if hither to unavailable higher frequency data on the variables were used.

Inasmuch as this study has revealed important findings there is still more that needs to be explored in future studies. For instance, due to data unavailability, the study could not investigate whether the benefits of FDI vary across sectors in Malawi. Another area that future studies may explore is the specific channels through which FDI impacts on economic growth, for instance, increase in productivity and efficiency resulting from technological advancement.

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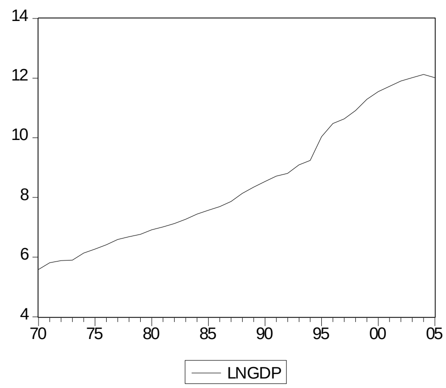
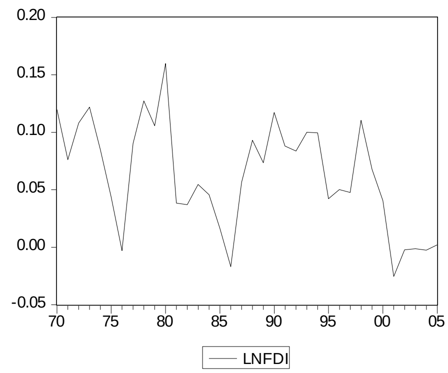
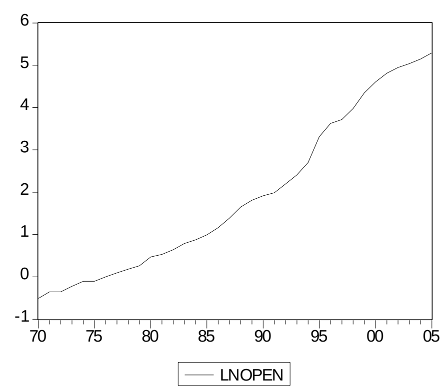
APPENDICES

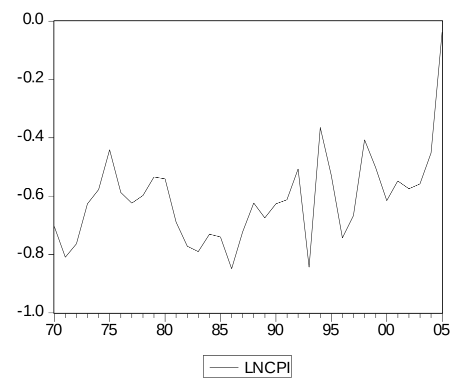
Appendix 1

Graphs of Variables in Levels

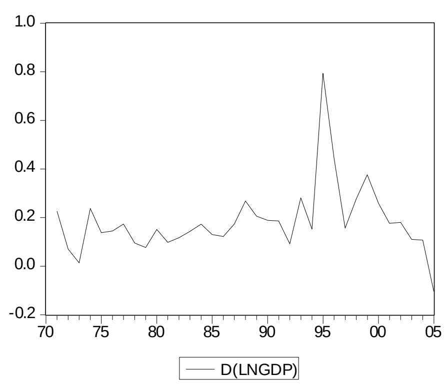


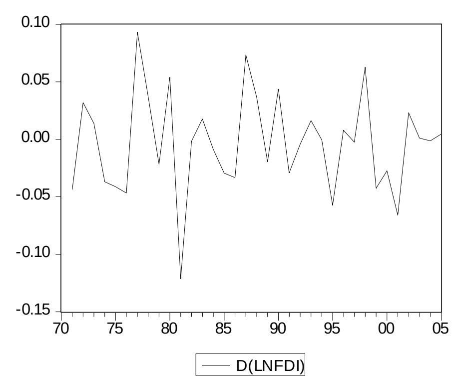


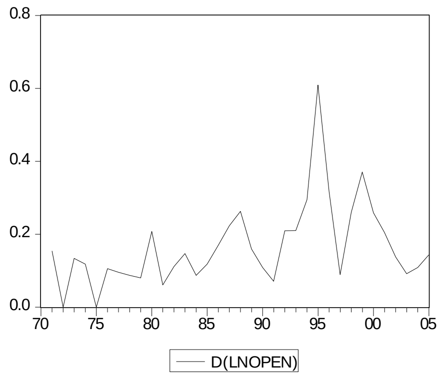


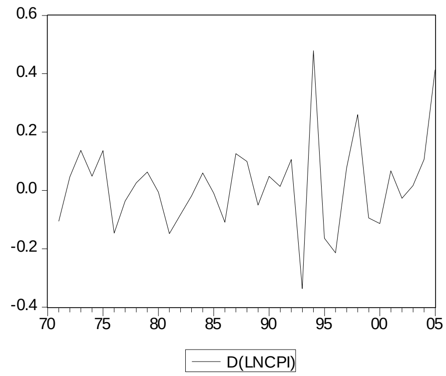


Graphs of Variables in Differences









Appendix 2: Normality Test Results of the VEC Model

Component	Skewness	Chi-sq	df	Prob.
1	-0.319408	0.671368	1	0.4126
2	0.023612	0.003669	1	0.9517
3	0.044090	0.012792	1	0.9099
4	0.116875	0.089891	1	0.7643
Joint		0.777720	4	0.9414
Component	Kurtosis	Chi-sq	df	Prob.
1	1.657992	2.916675	1	0.0877
2	1.060325	6.674845	1	0.0098
3	1.275077	5.147918	1	0.0233
4	1.142914	6.064185	1	0.0138
Joint		20.80362	4	0.0003
Component	Jarque-Bera	df	Prob.	

1	3.588043	2	0.1663	
2	6.678514	2	0.0355	
3	5.160710	2	0.0757	
4	6.154076	2	0.0461	
Joint	46.55620	55	0.7841	

Appendix 3: VEC Residual Serial Correlation Test

LAG	LM-Statistic (16 df)	P-Value
1	22.20670	0.1366
2	29.40732	0.0213
3	20.97388	0.1795

Appendix 4: Serial Correlation Test for Each Equation in the VEC

Dependent Variable	F-Statistic	P-Value
D(LNGDP)	0.016422	0.983722
D(LNFDI)	0.927842	0.407225
D(LNOPEN)	0.234349	0.792622
D(LNCPI)	0.105578	0.900160

Appendix 5: White's Heteroskedasticity Test (no cross Terms)

Chi-Stat	df	P-Value
227.23	220	0.35

Appendix 6: Accumulated Impulse Response

D(LNGDP)				
Year	D(LNGDP)	D(LNFDI)	D(LNOPEN)	D(LNCPI)
1	0.088155	0.000000	0.000000	0.000000
5	1.000529	0.155280	0.297841	-0.065830
10	3.178694	0.819320	0.460593	-0.216046

D(LNFDI)				
Year	D(LNGDP)	D(LNFDI)	D(LNOPEN)	D(LNCPI)
1	0.013363	0.041086	0.00000	0.000000
5	0.041453	0.065886	0.002196	-0.007273
10	0.011405	0.071803	0.010489	-0.004388
D(LNOPEN)				
Year	D(LNGDP)	D(LNFDI)	D(LNOPEN)	D(LNCPI)
	0.050322	0.017276	0.066171	0.000000
	0.743216	0.164075	0.339875	-0.099040
	2.752627	0.707974	0.465376	-0.265064
D(LNCPI)				
Year	D(LNGDP)	D(LNFDI)	D(LNOPEN)	D(LNCPI)
1	-0.013287	0.032798	0.061995	0.090484
2	-0.231535	0.104759	0.134036	0.157095
3	-0.750609	0.011993	0.265770	0.173359

Appendix 7

Data Used in Study

YEAR	GDP	FDI	CPI	OPEN
1970	267.1	34	0.6	0.494871
1971	334.9	26.5	0.7	0.445058
1972	359.1	41	0.7	0.466174
1973	364	47.2	0.8	0.534536
1974	461.5	40.9	0.9	0.561291
1975	529.7	23.7	0.9	0.643351
1976	612	-1.8	1	0.555719
1977	728	68.8	1.1	0.535843
1978	800.7	108.8	1.2	0.550027
1979	864.5	96.4	1.3	0.585941
1980	1005.1	174.1	1.6	0.582304
1981	1108.1	43.5	1.7	0.502099
1982	1245.1	46.9	1.9	0.462367
1983	1436.9	80.7	2.2	0.453807
1984	1707.4	79.9	2.4	0.481655
1985	1944.9	32	2.7	0.477228
1986	2197.6	-36.9	3.2	0.427852
1987	2614	152.2	4	0.485446
1988	3417.9	333.6	5.2	0.535973
1989	4199.2	320.7	6.1	0.50948
1990	5069.9	631.2	6.8	0.534632
1991	6105.5	562	7.3	0.541931
1992	6693.8	585.1	9	0.602502
1993	8868.9	933.5	11.1	0.430234
1994	10324.7	1080.7	14.9	0.694214
1995	22821.9	983.3	27.4	0.589235
1996	35535.6	1827.1	37.6	0.47568
1997	41558.8	2031	41.1	0.513263
1998	54788.6	6395	53.3	0.665456
1999	79817.8	5601.2	77.2	0.605627
2000	103425.2	4281.9	100	0.540558
2001	123291.2	-3099.4	122.7	0.578279
2002	147580.7	-329.3	140.8	0.562813
2003	164804.2	-200	154.3	0.572126
2004	183455.3	-453	172	0.636334
2005	165238.5	346	198.5	0.962406