UNIVERSITY OF CAPE COAST

MACROECONOMIC DETERMINANTS OF FOREIGN DIRECT INVESTMENT IN GHANA

BY
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MAY, 1999.

CANDIDATE'S DECLARATION

"I, **Justice J. Arthur**, declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere".

Signature: ..... Date: 1st Dec., 1989

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SUPERVISORS' DECLARATION

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

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ABSTRACT

This study examines the macroeconomic determinants of Foreign Direct Investment (FDI) in Ghana, using the Johansen Multivariate cointegration technique. Some elements of the Neoclassical and Eclectic approaches to the determinants of FDI are used to develop a dynamic simultaneous equation model and then the system is estimated simultaneously by using the Full Information Maximum Likelihood (FIML) method. The Granger Non-causality test is used to determine how the endogenous variables drive each other. The long-run equations for exchange rate, foreign direct investment, domestic price level, real output, and natural resources are estimated so as to know the long-run partial elasticities. The relative importance of each endogenous variable in accounting for its own behaviour and that of the other variables in the VAR system is pointed out by decomposing the forecast error variance. The impulse response functions are used to study the impact of a random shock in one of the endogenous variables on the other endogenous variables. The impact of Economic Recovery Programme and Political instabilities on the endogenous variables is also examined.

It was realised that there is bi-directional causality between the rate of inflation and the growth rate of real output, the growth rate of the exchange rate and the growth rate of natural resources, the rate of inflation and the growth rate of natural resources, the growth rate of exchange rate and the rate of inflation as well as the growth rate of real output and the growth rate of natural resources. However, there is a uni-directional causality between the growth rate of the exchange rate and the growth rate of FDI, the growth rate of foreign direct investment and the growth rate of natural resources as well as the growth rate of FDI and the growth rate of real output. But the foreign direct investment and the

rate of inflation do not predict each other and also the growth rate of the exchange rate and the growth rate of real output do not granger-cause each other.

In the exchange rate market, the long run determinants are the rate of inflation, natural resource growth and the real output growth. Foreign direct investment constraint is determined by the rate of growth of the exchange rate and the real output growth. The rate of inflation is determined by the rate of growth of the exchange rate, the rate of growth of foreign direct investment, natural resource growth and the rate of growth of real output. The rate of growth of the exchange rate, the rate of growth of foreign direct investment and the rate of inflation are also seen as the long run determinants of the rate of growth of real output in the labour market. The natural resource growth is determined by the growth rate of the exchange rate and the rate of inflation.

The exchange rate can therefore, be used as policy tool to influence foreign direct investment growth in Ghana. The government can influence the level of FDI inflow in the long-run by using the exchange rate as a policy instrument and also improving the level of productivity as a strategy. To enhance the exploitation of natural resources, there is the need to stimulate the inflow of foreign direct investment and also to improve the income level of the people.

Last, but not the least, I wish to thank all my friends, especially Mr. Richmond Ago Amartey, Mr Marx Koomson, Mr. Steve Nortey and all other personalities who helped in diverse ways in bringing this work to a successful completion.

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DEDICATION

This thesis is dedicated to : Efua Pentsiwah, my dear sister for her support throughout my education, Madam Ama Bresiwah, my mother, for her toil and my dear grandfather Samta Edoukoh—who could not live to see the fruits of his encouragement, moral support and financial investment.

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CHAPTER ONE

INTRODUCTION

This chapter covers the statement of the problem, objectives of the study , and the statement of hypotheses. The significance of the study, data description and sources, as well as the limitations of the study are also considered.

1.0 BACKGROUND TO THE STUDY

Prior to 1983, inappropriate domestic policies coupled with external shocks [drought in 1975-77 and 1981-83] led to a severe deterioration in economic and financial performance. Large fiscal deficits, financed primarily by borrowing from the domestic banking system, gave rise to high rates of inflation and overvalued exchange rate. Heavy government intervention in the economy as well as massive expansion of the public sector through the establishment of a large number of state enterprises, worsened the distortions in the economy and destroyed any incentives to produce, save, and invest. In April 1983, the Ghana Government launched its Economic Recovery Programme [ERP] that was intended to reverse the deterioration in the economy.

Initially, the ERP focused on macroeconomic policies intended to address certain imbalances and distortions in the economy. A lot of progress has been made. The government has pursued a program of financial and structural reforms which have been hailed by the international community as a good example of adjustment with growth. These programmes have been supported not only by the IMF and the World Bank but also by bilateral and multilateral external financial assistance. As a consequence, Ghana's macroeconomic and financial performance have improved substantially after a prolonged period of decline. So one may be interested in knowing whether the ERP has been

successful in raising the rates of growth of GDP and foreign direct investment, in controlling the domestic rate of inflation, in correcting the overvalued exchange rate and in the implementation of natural resource policy so as to raise the exploitation of natural resources. And also to determine whether the political instabilities in Ghana have had any effect on the growth rates of GDP, growth rate of foreign direct investment, the rate of inflation, the growth rate of exchange rate and the exploitation of natural resources.

Despite the improvements in economic performance, Ghana continues to be confronted with a number of constraints. Among the constraints are the levels of savings and investment and the exploitation of natural resources that are too low to allow self-sustained growth and this has caused a lot of concern in government and academic circles about the sustainability of the achievements so far. For example, the rate of saving was 12.2%, the rate of private investment was 4.3%, and the rate of natural resource exploitation was 9.6% during 1992-1996.

According to the World Bank, the level of domestic savings and investment is inadequate to fuel the growth needed to raise living standards and generate sufficient productive employment. The Bank notes that the major share of the additional savings and investment required must come from private source.

1.1 STATEMENT OF RESEARCH PROBLEM

When a country suffers a resource or savings gap, it will also confront a foreign exchange gap that will have to be filled with an inflow of foreign capital. In macro economic terms, when government expenditure plus private investment (G+ I) exceed government revenue and private savings (a resource gap), this internal imbalance will spill over into an external imbalance of imports greater than exports, and hence

constitute a foreign exchange gap. International financial intermediation is then required to fill the foreign exchange gap. This can be accomplished by loans from the multilateral lending agencies and commercial banks, or by private foreign investment.

In the wake of the 1982 debt crisis, most African countries discovered that Western European banks were reluctant to renew, much less, increase their credits to third world governments [Gary et. al., 1995]. The effects of reduced flows of credit from foreign commercial banks was further compounded by a long term decline in the flow of Overseas Development Assistance (ODA) to the least developed countries. In response to reduce inflows of external resources African Countries, along with other developing countries, started to implement economic reforms to attract Foreign Direct Investment [FDI] to boost investment and raise the rates of economic growth. The response of FDI to the economic reforms has been dramatic. The flow of FDI to developing countries ballooned from US$111 billion in 1980 to US$330 billion in 1992. However, much of the increase in FDI went to Asia and Latin America, with Africa accounting only for about 6.2% [Hoogang, et. al., 1994], and Ghana 0.04% of the total FDI flows. From 1994-1997, FDI inflows to developing countries increased from US$ 434 billion (17% of global inflows) to US$ 549 billion (37% of global inflows). (World Investment Report, 1998: Trends and determinants). Developing countries account for nearly a third of the global inward FDI in 1997, increasing from one-fifth in 1990.

The exploitation of natural resources is important in economic development because it can bring in the needed resources for the acquisition of capital equipment for development and also the funds to finance infrastructural development. Also through the exploitation of natural resources, foreign technology can be transferred into the domestic

economy which is necessary for Ghana's economic development.

So one may be interested in knowing why the FDI inflows has remained so low inspite of the government's reform programmes.

Therefore, this study develops a dynamic simultaneous equation model for FDI in Ghana. The reason is that the single equation models for FDI as developed by Ekpo (1996), Mulenga (1997), Bajurubia and Sosvilla-Rivera (1994), Wang and Swain (1995) etc. are liable to simultaneous equations and omitted variables bias. Also the single-equation studies tend to limit the number of variables considered. Developing an appropriate simultaneous equation model of FDI for Ghana would therefore enable more explanatory variables to be considered and reduce the problem of simultaneous equations and omitted variables bias.

1.2 OBJECTIVES OF THE STUDY

The principal objective of this study is to empirically analyze the determinants of foreign direct investment in Ghana, using time series data from 1966 to 1996. The choice of data points is based on data availability. Specific objectives are to

1. Examine the effect of foreign direct investment and the exploitation of natural resources on the domestic price level, the exchange rate and the real output
2. Examine the direction of causality among foreign direct investment, exchange rate, domestic price level, real output and natural resources.
3. Estimate both short-run and long-run (pass through) equations for exchange rate, foreign direct investment, domestic price level , real output, and natural resources
4. Examine the impact of Economic Recovery Programme on the endogenous variables.
5. Examine the impact of Political instabilities (coup d'etat) on the endogenous variables.

6. Examine the impact of fiscal deficit, foreign debt, domestic interest rate and the foreign interest rate on the endogenous variables.

7. Suggest some policy implications.

1.3 STATEMENT OF HYPOTHESES

The specific hypotheses to be tested in this study for Ghana are:

(1) Ho: There are no feedback effects in the short-run between the different markets and the endogenous variables.

Ha: There are some feedback effects in the short-run between the different markets and the endogenous variables.

(2) Ho: FDI has no effect separately on real output, exchange rate, domestic price level, and the exploitation of natural resources.

Ha: FDI has some effect separately on real output, exchange rate, domestic price level, and the exploitation of natural resources. .

(3) Ho: Natural resource exploitation has no effect separately on FDI, real output, exchange rate, and domestic price level.

Ha: Natural resource exploitation has some effect separately on FDI, real output, exchange rate, and domestic price level.

(4) Ho: Inflation has no effect separately on FDI, real output, exchange rate, and the exploitation of natural resources.

Ha: Inflation has some effect separately on FDI, real output, exchange rate, and the exploitation of natural resources.

(5) Ho: Exchange rate has no effect separately on FDI, real output, domestic price level and the exploitation of natural resources.

Ha: Exchange rate has some effect separately on FDI, real output, domestic price level and the exploitation of natural resources

(6) Ho: There is no effect of Political instability (coup d'etat) on the endogenous variables.

Ha: There is some effect of Political instability (coup d'etat) on the endogenous variables.

(7) Ho: There is no bi-directional causality among any two endogenous variables and the error correction terms

Ha: There is bi-directional causality among some two endogenous variables and the error terms

(8) Ho: There is no effect of Economic Recovery Programme on the endogenous variables

Ha: There is some effect of Economic Recovery Programme on the endogenous variables

1.4 SIGNIFICANCE OF THE STUDY

This study is an econometric analysis of the major macroeconomic determinants of foreign Direct Investment in Ghana. Most studies on the determinants of FDI in both the developed and developing countries as well as in sub-Saharan Africa are of cross sectional type and have in most cases applied descriptive analysis and single-equation technique. First, this study will apply standard econometric techniques to develop a simultaneous equation model of FDI for Ghana to analyze the determinants of FDI and examine the short-run and long-run relationships among the variables. Secondly, because the analysis is rigorously based on existing theories of FDI, the study will improve our understanding

of the factors that influence FDI flows in developing countries like Ghana, and could help the government of Ghana to formulate consistent policies that will increase FDI inflows. Thirdly, because the study examines the impact on FDI of opening up the economy to international trade it will provide a framework for examining the potential effects of the stabilization and structural adjustment program on investment and growth in an international environment. Fourthly, the Forecast Error Variance Decomposition will help us to understand the extent to which innovations in any of the endogenous variables are explained by the other variables in the system. Fifthly, the impulse response functions will help us to explain how the rest of the variables in the system respond when there is an unanticipated change in one of the variables. Finally, the short-run and the long-run elasticities that shall be derived from the error correction model will assist us to understand how the endogenous variables respond to a percentage change in the other variables.

1.5 DATA SOURCES AND DESCRIPTION

The study uses quarterly data from 1966 to 1996. The choice of data period is based on data availability because complete data set for all the variables start from 1966. The data used include the foreign direct investment (FDI) which is defined as direct investment in Ghana by foreign investors, real output represented by Gross Domestic Product (GDP) series as a proxy for market size, government fiscal deficit, foreign debt, domestic interest rate proxied by the discount rate, foreign interest rate also proxied by the weighted rate of interest of the three major investors in Ghana i.e United States, Germany and Britain. (this rate of interest is used as a proxy for the opportunity cost of capital (FDI) or rate of return on investment); the nominal exchange rate which is the

quarterly inter-bank exchange rates between cedi and US dollar; natural resources which is proxied by the weighted index of Cocoa and Gold exports; and the domestic price level which is proxied by the consumer price index. The annual GDP series was interpolated using the 'Expanded Procedure' available in SAS to obtain the quarterly data. Two dummy variables were also used to represent the change in Political regimes in Ghana and also the Economic Recovery Programme.

The data for the foreign direct investment (FDI) are obtained from IFS (various issues). The data on the exchange rate variable are obtained from IFS (various issues) and Quarterly Digest of Statistics of Ghana (June 1994, vol. 12, No.2). The interest rates are compiled from IFS year book (various issues) before the weighted averages for the foreign interest rate from Ghana's three major trading partners are calculated.. The domestic and foreign interest rates are the lending rates and they can be found in line 60c of the IFS year book (various issues). The GDP is obtained from IFS (various issues). The data on natural resource variable—average of cocoa and gold exports—were obtained from various monthly issues of IFS The data on fiscal deficit are obtained from various issues of IFS and World Tables. The data on foreign debt variable are obtained from World Tables, 1992 and various issues of the IFS. Finally, the data on CPI are obtained from the World Bank year book (various issues) and African Development Indicators (various issues).

Other sources of information were reviewed to augment the data requirement when those provided in the IFS, World Bank Year Books and African Economic Indicators were not up to date. These included The State of the Ghanaian Economy, published by ISSER, (Legon), Macroeconomic Review of Ghana, published by CEPA,

Ghana Investment Promotion Centre Quarterly Report, published by GIPC and Economic Surveys of Ghana by The Statistical Service. This helps to ensure good data quality.

1.6 LIMITATIONS OF THE STUDY

1.There is some problem of data quality, for example, the interpolation of GDP data was used since quaterly data was not available on this variable. Moreover, as noted by Kholdy (1995), data compiled in most developing countries, including Ghana, are inaccurate and may therefore bias the empirical results.

2.The exchange rate should actually be a weighted average of that of Ghana's trading partners.

3. The natural resource should have been proxied by the weighted average of Ghana's three major primary commodity exports. But data for diamond for many years was not available.
4. Ghana, being a small open economy, should be a price-taker with the price level being exogenously determined. But we have assumed in this study that the domestic price level is endogenously determined.
5. We should have considered the interest differential between the domestic interest rate and the foreign interest rate as a determinant of FDI.

1.7 OUTLINE OF THE REMAINING CHAPTERS

The remaining chapters will be as follows. Chapter two provides an overview of the Ghanaian economy before and after the ERP in 1983 and examine the investment environment in Ghana since 1950 up to date. It also reviews the trends in FDI and other endogenous variables as well as statistics of FDI projects in Ghana. The third chapter looks at the literature review. It reviews literature on the theories of foreign direct

investment and determinants of FDI which help in identifying an appropriate model for the analysis. Review of empirical literature for both the developed and developing countries are also considered in this chapter. In chapter four, the model is specified, and the methodology for the estimation is also outlined. Chapter five takes care of the estimation and the interpretation of the results of the analysis.

The summary, conclusions, policy implications and recommendations of the study are presented in chapter six.

CHAPTER 2

OVERVIEW OF THE GHANAIAN ECONOMY

2.4 INTRODUCTION

The purpose of this chapter is to provide an overview of the macroeconomic performance of the Ghanaian economy before and after the ERP in 1983 and examine the investment environment in Ghana since 1950 up to date. The chapter also reviews the trends in foreign direct investment and other endogenous variables in Ghana. The first part provides an overview of the macroeconomic performance of the Ghanaian economy before and after the ERP in 1983 and the second part reviews the political instability and foreign direct investment in Ghana, the measures to improve the investment climate, investment incentives and Private Foreign Investment Policy in Ghana. The last section of this chapter considers the review of trends in FDI and other endogenous variables as well as statistics on investment projects in Ghana.

2.1 THE ECONOMY OF GHANA FROM 1960 TO THE DAWN OF 1983

At independence in 1957, Ghana had an appreciably high level of real per capita income compared to other Sub-Saharan African countries. Ghana was then considered a middle-income country. The growth of real GDP continued at the rate of about 3% until the mid 1960's, stimulated by high exports of cocoa.

In the 1970's economic performance started to decline as revenue from cocoa exports declined and as world energy prices and interest rates rose sharply. The average growth rate of GDP declined from 4.3% between 1967 - 1971 to 0.3% between 1972 - 1977. Real per capita GDP growth rate worsened declining from 2.0% between 1967 - 1971 to -2.3% between 1972

- 1977. The situation aggravated in the early 1980's as primary commodity prices collapsed. Internally, economic management weakened substantially and political instability increased. For the first time in post-independence history of Ghana the economy recorded a negative average GDP growth rate (-1.6%) from 1978 - 1983. Table 2.1 below summarizes the performance of the economy from 1961 to early 1983.

TABLE 2.1: GHANA: KEY MACROECONOMIC INDICATORS 1961-1983.

SOME MACROECONOMIC INDICATORS	PERIOD AVERAGE			
	1961-1966	1967-1971	1972-1977	1978-1983
REAL GDP GROWTH	3.0	4.3	0.3	-1.6
REAL GDP PER CAPITA GROWTH	0.4	2.0	-2.3	-4.6
PRIVATE INVESTMENT/GDP	8.4	8.4	5.5	2.8
PUBLIC INVESTMENT/GDP	8.4	3.9	4.8	2.0
PRIVATE SAVINGS/GDP	7.8	6.3	13.0	8.5
PUBLIC SAVINGS/GDP	2.4	1.8	3.9	2.2
FISCAL BALANCE/GDP	-6.4	-3.4	-10.0	-6.1
BROAD MONEY (M2) GROWTH	41.6	-4.1	36.9	38.9
M2/GDP	–	–	24.7	17.6
GROWTH OF PRIVATE SECTOR CREDIT	22.8	22.6	14.1	33.1
GROWTH OF PUBLIC SECTOR CREDIT	–	–	48.3	54.1
REAL LENDING RATE	-2.9	5.8	-16.8	-28.5
INFLATION RATE	11.8	3.9	41.5	73.0
TERMS OF TRADE (1985=100)	89.9	111.1	142.7	117.8
MERCHANDISE EXPORT (% OF GDP)	19.3	17.1	15.7	5.1
MERCHANDISE IMPORT (% OF GDP)	21.4	15.7	12.6	4.5
GROWTH RATE OF TOTAL EXPORTS	–	–	19.1	7.9
GROWTH RATE OF TOTAL IMPORTS	–	–	29.0	77.0
(CURRENT A/C) /GDP	-5.9	-4.1	0.6	-0.3
EXTERNAL DEBT/ GDP	–	–	22.4	8.9
FOREIGN DIRECT INVESTMENT/GDP	8.01	31.4	18.03	9.58
NATURAL RESOURCES/GDP	0.39	0.57	1.59	7.74

Source: Ghanaian Authorities and IMF staff estimates.

The macroeconomic policy environment was increasingly characterized by large imbalances. There were large budget deficits, averaging 10 percent of GDP from 1972 to 1977. During the 1972 - 1977 period the ratio of public saving to GDP was 3.9%. The ratio fell further to 2.2% between 1978 and 1983. To finance the large budget deficits, the government borrowed from the Central Bank, which led to increased money supply. Within the period of 1970's through 1982, the monetary base expanded by 40% on the average. Inflation rose sharply despite price controls. Between 1978 and 1982, the rate of inflation coupled with price controls discourage private savings and investment in productive sectors. From 1961 through

1971, the average ratio of private investment to GDP was 8.4%, it was 5.5%, on the average, between 1972 - 1977, and 2.5% between 1978 and 1983. The official exchange rate which was pegged from 1960 through 1982, became overvalued. By 1982 the overvaluation exceeded 1, 000%. This situation led to an acute scarcity of foreign exchange which crippled the industrial and agricultural sectors. The development of a parallel foreign exchange market was, therefore, inevitable, contributing to further macroeconomic instability.

For the period 1961-1966, FDI was only 8.01% of GDP and for 1967-1971, it increased to 31.4%. For 1972-1977, FDI declined to 18.3% of GDP due probably to the military regime or political instabilities that prevailed in the country at that time. Also for 1978-1983, it declined further to 9.58% of GDP. Contribution of natural resource to GDP was not encouraging as it formed about 0.39% of GDP in 1961-1966 and 0.57% of GDP in 1967-1971. However, in 1972-1977 the exploitation of natural resources formed about 1.59% of GDP and this increased further to 7.74% in 1978-1983.

In a nutshell, the economy of Ghana before the ERP was characterized by: large budget deficits, and pervasive controls. By early 1983, the economy had virtually collapsed.

2.2 GHANA AFTER HER ECONOMIC RECOVERY PROGRAM

Beginning in 1983, the government of Ghana introduced an economic recovery program to revitalize the economy. The main objectives of the Economic Recovery Programme (ERP) were to: (1) restore production incentives for food, industrial raw material and export commodities; (2) increase the availability of foreign exchange in the country; (3) increase the availability of essential consumer goods; (4) decrease the rate of inflation; (5) rehabilitate the physical infrastructure; and (6) undertake studies to restructure economic institutions [1].

1 see Sowa, N.K (1993)

Essentially, the policies undertaken in the 1983 reform were geared towards encouraging the expansion of private savings and investment in a market-based economy, with the private sector as the engine of growth. From table 2.2 below, it can be seen that real GDP growth recovered from -1.6% between 1977 - 1983 to 3.6% between 1983 - 1986, the first phase of the ERP, a period considered by most economists as the period of stabilization. This growth rate of real GDP is slightly higher than the 3.0% recorded over the 1969-1966 period but lower than the 4.3% achieved in 1967 - 1971.

TABLE 2.2:SUMMARY OF THE PERFORMANCE OF THE GHANAIAN ECONOMY DURING AND AFTER ADJUSTMENT PROGRAMME

SOME MACROECONOMIC INDICATORS	PERIOD AVERAGE		
	1983-1986	1987-1991	1992-1996
	1ST PHASE OF ERP	2ND PHASE OF ERP	POST ERP
REAL GDP GROWTH	3.6	4.8	5.2
REAL GDP PER CAPITA GROWTH	1.0	2.2	1.2
PRIVATE INVESTMENT/GDP	3.8	7.0	4.3
PUBLIC INVESTMENT/GDP	3.7	7.6	12.2
PRIVATE SAVINGS/GDP	5.2	6.7	7.4
PUBLIC SAVINGS/GDP	0.5	5.4	5.7
FISCAL BALANCE/GDP	-1.7	0.7	-1.7
BROAD MONEY (M2) GROWTH	55.9	33.9	42.2
M2/GDP	12.5	14.5	17.1
GROWTH OF PRIVATE SECTOR CREDIT	86.3	40.1	44.2
GROWTH OF PUBLIC SECTOR CREDIT	68.9	49.2	36.4
REAL LENDING RATE	-12.2	-3.0	7.8
INFLATION RATE	49.3	30.3	37.0
TERMS OF TRADE (1985=100)	100.1	82.8	58.2
MERCHANDISE EXPORT (%OF GDP)	8.2	15.5	18.1
MERCHANDISE IMPORT (% OF GDP)	8.5	19.1	26.5
GROWTH RATE IN TOTAL EXPORTS	100.4	25.6	55.4
GROWTH RATE IN TOTAL IMPORTS	100.2	37.3	47.2
(CURRENT A/C) /GDP	-1.4	-2.5	-6.5
EXTERNAL DEBT/GDP	29.2	56.7	75.9
FOREIGN DIRECT INVESTMENT/GDP	0.05	0.20	2.02
NATURAL RESOURCES/GDP	66.2	35.6	9.6

Source: Ghanaian Authorities and IMF staff estimates

During the second phase of the ERP (1987 - 1992), the period of adjustment, the economy registered some further improvement with real GDP growth rate rising to 4.8%, higher than in any period since independence.

Within the entire period of the ERP, the economy recorded an annual real growth rate of 5% and the real per capita income growth rate of 2%.

The ERP improved the fiscal balance. The high fiscal deficit of -6.1% of GDP between 1978 - 1983 declined to -1.7% during the first phase of the ERP and in the second phase of the ERP there was, for the first time in the post independence history of Ghana, a budget surplus amounting to 0.7% of GDP. This helped to reduce the growth of money supply which brought down inflation. Throughout the ERP the average rate of inflation fell, averaging 49.3% between 1983 - 1986 and 30.3% between 1987 - 1991 compared to 73.0% between 1978 - 1983. The rate of inflation within the first phase of the ERP was higher than all the historical rate except during 1978 - 1983. This, however, was "corrective inflation" brought about by the removal of subsidies and currency devaluation. For the period 1992-96, inflation has increased to an average of 37%.

The ERP also improved exports. The volume of merchandise export as a percentage of GDP increased from 5.1% between 1978 - 1983 to 8.2% and 15.5% during the first and second phase of the ERP respectively. Merchandise imports as a percentage of GDP also grew, rising from 4.5% on the average between 1977 - 1983 to 8.5% and 19.1% on the average during the first and the second phase of the ERP respectively. The high growth of imports, relative to exports, led to the deterioration of the current account balance which declined from -1.4% of GDP between 1983 - 1986 to -2.5 between 1987 - 1991. The volume of exports also increased from 15.5% in 1987-91 to 18.1% in 1992-96. The imports also increased from 19.1% in 1987-91 to 26.7% in 1992-96. This also worsened the current a/c balance from -2.5% in 1987-91 to -6.5% in 1992-96.

Gross receipts from merchandise exports in 1997 were generally poor, but not unexpected, in the light of a continuing fall in the price of gold on the world markets and the weakened incentives system to export, as the real exchange rate appreciated for the third consecutive year.

For the first time since 1993, Gross receipts declined for both traditional and non-traditional export commodities by 7.3% from US$1641.9 million in 1996 to US$1522.1 million in 1997. Apart from timber (and some non-traditional export commodities) which saw commendable improvements in terms of revenue, performance of all other major export commodities (cocoa, gold, diamonds, bauxite, manganese and electricity), was dismal and below the average for 1995 and 1996.

To a considerable extent, developments in the country's export sector in 1997, reflected the effects of the continuous real appreciation of the cedi, and supply constraints (including pre-shipment difficulties in accessing credit, high rental charges and other incidental costs). Although, to a lesser extent, unfavourable world market conditions also contributed, especially the sharp fall in gold prices.

In spite of the falling world price of gold, the volume of gold exports increased by 2.7% from 1.58 million fine ounces in 1996 to 1.63 million fine ounces in 1997. This, however, was apparently not enough to compensate for the price fall, resulting in the value of gold exports declining from US$612.4 million in 1996 to US$564.7 million in 1997. In spite of these sharp falls, thanks to much lower cocoa volumes, gold remained the dominant foreign exchange earner. Earnings, however, shrank from 9.4% of GDP in 1996 to 8.4% of GDP in 1997.

The performance of cocoa in terms of output was all the more disappointing since it meant that Ghana could not obtain full benefit from favourable price developments on the international cocoa market in 1997. Since the beginning of the 1990s, cocoa prices have shown considerable swings. The unit price of beans reached its highest level at US$1522 per metric ton in 1995. It then dipped to US$ 1374 per ton in 1996— a fall of 9.7%— before subsequently rising to US$1456 per ton by the end of 1997.

Despite the increase in prices in 1997, the volume (of the main crop bean equivalent) exported fell by 83 thousand metric tons to 318.6 thousand metric tons in 1997. Gross receipts from the export of cocoa beans and products consequently fell from US$551.8 million in 1996 to US$464.0 million in 1997. Cocoa's contribution to gross export earnings in 1997 amounted to 6.7% of GDP, compared with 8.5% of GDP in 1996, keeping cocoa as the second most important foreign exchange earning commodity, after gold.

Foreign direct investment's contribution also increased from 0.05% of GDP in the 1st phase of the ERP to 0.20% in the 2nd phase of the ERP. In the post ERP, the share of FDI in GDP increased to 2.02%. This can be partly attributed to sound investment environment created by the government as well as various incentive packages offered to investors under the new investment code.

In summary, the ERP helped restore macroeconomics stability in Ghana. Fiscal deficits declined and inflation was also brought down. However the current account deficit and external debt have been rising, The relative improvement in the economy resulted from the implementation of wide-ranging policy reforms. We examine briefly the policy reforms related to the exchange rate, the government budget, monetary aggregates, the financial sector, Foreign Direct Investment and natural resources.

2.3 EXCHANGE RATE POLICY

After April 1983 the government of Ghana implemented a four-stage exchange rate reform. During the first stage the massive overvaluation of the cedi was corrected through a sizable discrete exchange rate adjustment. From April 1983 to January 1986, the rate which was pegged at 2.75 cedis per US$, was devalued to 90 cedis per US$. Within the second stage, which started in September 1986, the exchange rate was floated. The government then

introduced a dual exchange rate system for official transactions. Access to the auction was gradually broadened to include all payments and transfers for current international transactions by early 1990. During the 3rd phase, which overlapped with the second stage, the parallel market for foreign exchange was absorbed. By 1988 private Forex Bureaus were in full operation and the exchange rate was free floating. This policy was intended to make Foreign exchange available to the private sector for the importation of inputs and thereby enhance private investment. The devaluation of the cedi also increased the real domestic producer price of Cocoa and improved Cocoa production and exports.

Between 1983 and 1990 the volume of exports, on the average, increased by 10%, reversing the contraction in the previous two decades. The final phase of the exchange rate reform began in early 1990 and by April, 27, 1990, the Bank of Ghana discontinued the retail auction of foreign exchange and introduced the wholesale auction. In 1992 the Central Bank abolished sale auctions introduced in 1986 and the management of exchange rates now takes place directly in the inter-bank markets.

For three years in a row to 1997, the real exchange rate appreciated significantly. Very sharp depreciation in the nominal rate in the first half of the year, forced the bank of Ghana to intervene by selling foreign currency in the markets. However, in the last quarter of 1997 its reserves ran seriously low, it resorted to moral suasion and administrative management. This was responded to by collusive rate fixing by the Association of Forex Bureaux. Both actions ignited the resurgence of the parallel market activities in foreign exchange transactions. Thus, in the first half of 1997, the nominal exchange rate depreciated by 19.4% in the interbank market and 23.4 % in the forex bureaux market.

On average, for the year 1997, the nominal exchange rate depreciated by 25.2% in the interbank market and 25.6% in the forex bureaux market. These rates contrast with much higher rates of depreciation of 36.4% and 32.1% in the interbank and forex bureaux markets respectively in 1996. In fact, the 1997 rates of nominal depreciation are the lowest since 1992.

One of the more visible indications of this intervention is the run-down of Ghana's international reserves. Ghana's gross international reserves which stood at 3.5 months imports cover in 1992, increased to 5.5 months cover in 1995 but have since dropped to 4.1 months in 1996 and 2.7 months in 1997. Given the venerability of Ghana's exports to external shocks, keeping a reasonable minimum of reserves is prudent economic management.

2.4 FISCAL POLICY

The period of ERP saw a changing role of the government in the management of the economy. The government exercised fiscal discipline, lowering expenditure and increasing revenue. The increase in revenue was achieved by lowering tax rates and broadening the base, and also by strengthening tax collection efforts.

The initial fiscal objectives of the government were specified in the first budget of the ERP (1983) as (i) control over the persistent budgetary deficits and (ii) addressing the problem of pervasive financial indiscipline in the economy. The Budget also recognised the premium that should be placed on revenue generation. Development of an effective tax collection mechanism and the widening of the tax net were viewed as effective methods of achieving revenue goals. On the expenditure side, rationalisation of government activity and avoidance of waste were regarded as crucial to the success of the recovery programme.

Subsequent policy statements pointed to the following measures as necessary conditions for growth:

the rehabilitation of the economic and social infrastructure;

the enhancement of economic incentive in order to raise productive capacity in the private sector; and promotion of public and private savings in order to increase overall national investment

2.4.1 TAX REFORMS

To expand the tax net, the Government took advantage of the collapse of crude oil prices on the world market in 1986 to introduce an excise duty on petrol. Ghana had a 90-day credit facility with the National Nigeria Petroleum Corporation (NNPC), crude oil parcels lifted in December 1985 and priced at about $35 per barrel were due for payment in March 1986. But the world crude oil price took a tumble in 1986 reaching as low as $15 per barrel. Thus, a major assumption of the 1986 budget on crude oil prices was violated and Ghana National Petroleum Corporation (GNPC) stood to reap a huge windfall profit. The Government moved in quickly to convert this windfall profit into an excise duty on petrol which yielded a revenue of ¢6.6 billion in 1986, rising to ¢78.6 billion and ¢282.8 billion in 1991 and 1996 respectively As a share of total revenue, petroleum tax moved from about 8.9 percent in 1986 to 20.2 in 1991 and to 12.5 percent in 1996 while that of cocoa dropped from 18.9 percent in 1986 to about 9.3 percent in 1991, but rose to 12.2 percent in 1996. Thus, by 1991 the petroleum tax had become a major source of government revenue. In addition to petrol, the tax base was expanded to include hairdressers, herbalists and passenger motor vehicles. Corporations were also being properly assessed, thereby reducing the incidence of tax evasion.

For purposes of administrative ease, the personal income tax rate structure of seventeen-chargeable-income brackets was streamlined into six-chargeable brackets in 1986 The rates were designed to progress from 5 percent on the first chargeable income of ¢36,000 to a top

marginal rate of 55 percent on income exceeding ¢180,000. Since 1986, the rate of restructuring has become an essential part of Government's revenue generation and income redistribution effort.

In 1991 the corporate tax rate was reduced from 45% to 35%; the capital gain tax was reduced to 5%, except for the capital gain tax on income from publicly traded companies as well as from mergers and acquisitions which stayed unchanged; and withholding tax on dividends was cut from 30% to 15%. These cuts in tax rates improved tax compliance. Government expenditure was reduced to 5% of the GDP from over 10%. In addition to cutting government consumption levels, the government implemented a comprehensive expenditure reform program aimed at reducing government involvement in activities that can be carried out by the private sector in a cost effective manner. At the same time public spending reoriented towards the sectors and activities that are known to promote long term growth, such as health, education and infrastructure.

Tax reforms during the period 1992-96 had two main objectives; (i) to increase revenue mobilization while reducing the reliance on cocoa; and (ii) to ensure that the tax system would contribute to the growth process through appropriate reduction in tax rates and the broadening of the tax base.

In the area of income tax, measures pursued were the widening of the salary brackets annually, lowering the marginal tax rates and increasing personal income tax relief while making allowances which were not being taxed subject to income tax. There has also been significant movement away from narrow-based production taxes to broader-based consumption taxes. In particular, the company income tax rate was lowered at first from 55% to 45% for most sectors. The import tariff was restructured to provide a lower and more uniform pattern

protection, while eliminating concessions granted on an institutional basis. In the area of les tax, measures included increasing sales tax collection by abolishing some of the emptions and shifting items from concession rate to the standard rate category. The purchase x on motor vehicles was increased.

To improve the business environment, the following tax measures were taken: (i) orporate tax was further reduced from 45 percent to 35 percent for non-financial and printing stablishments and to 40 percent for financial institutions; (ii) personal tax rates were reduced o a top marginal rate of 25 percent; (iii) dividend tax was reduced to 15 percent; and (iv) apital gains tax reduced to a maximum of 5 percent. In addition, tax deductions were also iberalised, with investment allowances which had been previously granted selectively and nade available to all enterprises.

Ghana's tariff structure provides for a relatively uniform and moderate levels of protection, with most rates ranging between 15 and 25 percent. Nevertheless, to eliminate distortions caused by the incidence of other taxes on domestic production and imports, trade taxes and tariffs were reviewed. Goods of a similar nature, whether imported or domestically produced, attracted the same rate of sales tax. In addition, the nominal tariff rate was reduced by a uniform 5 percentage points for most goods bearing duties higher than 15 percent. Government's intention was to continue to improve incentives for efficient export and import substitutes by introducing a lower and more uniform pattern of protection. This goal was achieved by equalizing the sales tax rate on domestically produced and imported excisable products, further reducing the highest import duties and simplifying the rate structure.

An important outcome of the various tax reforms has been the changing composition of tax revenues. The share of corporate tax in total taxes on income and property which stood at

58.2 percent in 1984, peaked to 68.3 percent in 1989, fell to 55.6 percent in 1992, and further declined to as low as 49.3 percent in 1993. By 1995 it rose to 57.2 percent , but declined again to 55.9 percent in 1996. The declining importance of corporate taxes was due mainly to the following three reasons: (i) tax rate reductions intended as incentive for expansion of corporate activity, (ii) falling profitability rates and (iii) the narrowed corporate tax base, resulting from low capacity utilization and outright exit of unprofitable companies.

In the case of tax administration, the two principal organizations, namely the Central Revenue and the Customs and Excise departments of the Ministry of Finance (MOF) were reorganized and strengthened into services outside the Civil Service. The Central Revenue became Internal Revenue Service (IRS) and Customs became Customs, Excise and Preventive Service (CEPS). Both organizations have succeeded in recruiting qualified accountants to augment and upgrade their staff. They are given revenue targets to collect each year and are paid bonuses when these targets are achieved or exceeded. The performance of both services has improved markedly, due to the institutional and procedural reforms which have been put in place.

The most innovative and comprehensive tax reform to date, the Value-Added Tax (VAT), was introduced in March, 1995 to replace both the domestic and import sales taxes. It is a multi-stage consumer expenditure tax scheme levied on the value added to an economic transaction undertaken by a business enterprise. In other words, VAT is levied as a percentage of the value added at the various stages of production and distribution. Since inputs are exempted from the tax, the final burden falls on the consumer.

In terms of economic growth and resource availability, a VAT scheme is neutral in the sense that irrespective of the type of production technique (labour- or capital-intensive), the tax

liability will remain the same. Secondly, the scheme provides a s..ble and flexible source of revenue because consumption (on which the tax is based) as a ratio of GDP does not generally fluctuate substantially. Furthermore, as a multi-stage tax covering both the production and distribution processes, VAT minimises the incidence of evasion. A single-stage tax such as the sales tax provides a less effective tax mechanism for such a purpose.

Operationally, due to the audit trail (invoicing) involved, VAT requires extensive education to ensure that registered companies administering the tax and the tax payers know exactly what the scheme entails.

Ghana's VAT Act, 1994 (Act 486) was passed on December 30, 1994 and became effective on March 1, 1995. It was intended to replace all existing sales and service taxes administered by CEPS and IRS. A secretariat- The Vat Secretariat- was established specifically to administer the new tax reform. Some of the basic canons of a "good" tax structure were both directly and indirectly applied in providing a case for the scheme. They included, inter alia, the need for (i) simplification (ii) broadening the tax base so as to create avenues for possible rate reductions without necessarily losing revenues; and (iii) raising efficiency of the tax system through the minimisation of distortions and removal of contradictions.

For example, the simplicity aspect was captured by the consolidation of two types of multiple rates, namely, 15 percent and 35 percent for sales tax and 10 percent and 20 percent for service tax administered by the IRS into a single rate of 17.5 percent.

In terms of coverage, there are two approaches which have been applied. In the one case, all items covered by VAT are specified and all other items are considered exempt. On the other hand, all the exemptions are specified and all activities excluded are assumed to fall under

VAT. The latter was the option adopted by Ghana. A key advantage of this option is the built-in flexibility which enables the widening of the tax base, especially because the emergence of new lines of economic activity would not necessarily require a new legislative coverage.

The VAT scheme was suspended in June, 1995, primarily because of the inflation it had fuelled and the accompanying agitation from buyers ,sellers and political interests. Other reasons for the failure of the reform included (i) insufficient education of the public on the provisions and implementation of the VAT Act; (ii) lack of the requisite official enthusiasm in supporting the VAT scheme. It is largely legitimate to assert that inter-agency rivalry from other revenue institutions was also to blame; (iii) its inception standard rate of 17.5 percent was regarded as too high compared with 15 percent sales tax which existed prior to the VAT; and (iv) the poor timing of its implementation since it went to magnify existing inflationary pressures generated by the national budget, especially the 20 percent price increase in petroleum products, culminating in more than proportionate increases in transportation fares. Foodstuff shortages at the time further compounded the inflationary problem, leading to high cost of living and consequent demands for upward adjustment of salaries. Eventually, Government found it prudent to withdraw the scheme and to re-institute the sales tax at its original rate of 15percent.

Finally, it is worth pointing out that the gradual tax education and the enforcement of compliance through established laws by CEPS and IRS have, to some extent, allayed public fear of both tax agencies and has lead to the re-introduction of the VAT scheme on December, 30 1998.

2.4.2 GOVERNMENT EXPENDITURE REFORM

The rationalisation of public expenditure has been a key element of the ERP. Some of the objectives of public expenditure policy pursued under the ERP are; (i) to raise salaries in the civil service in order to reduce the wide disparities with the private sector, especially for the highly skilled employees; (ii) to make adequate appropriations for operating and maintenance outlays, particularly in the priority areas of agriculture, health, and education; (iii) to ensure timely preparation and issuance of the budget; (iv) to increase capital expenditure and net lending in accordance with the public investment programme and (v) to improve its monitoring and execution. Thus wages and salaries in the civil service were increased annually, partially to offset the erosion in real incomes from the 1970s. The structure of the salaries was adjusted in order to reverse the severe compression in differentials between the top and bottom grades. This involved the implementation of a new salary relativity of 1:13.2 in instalments, starting from 1986 until 1992 when the full relativity was achieved. In addition, a policy of labour retrenchment was pursued with about 15,000 people redeployed during the ERP. The total wage bill as a percentage of current GDP increased from 2.0 percent in 1984 to a peak of 6.1 percent in 1992 before falling marginally to 5.8 percent in 1996.

To make appropriate allocations for rehabilitating the country's economic and social infrastructure, a three-year rolling Public Investment Programme (PIP) has been prepared since 1986. The PIP now covers about 97 percent of total Government development expenditure financed from the Budget and project grants. Out of the PIP total, 60 percent is allocated for the rehabilitation and development of economic infrastructure (roads, highways, ports), and 30 percent is allocated to the directly productive, mainly agricultural services and for rehabilitating the cocoa and mining sectors. The social sector development (PAMSCAD) accounts for 10

percent with emphasis on increasing access to basic health and education facilities, particularly in the rural areas and projects designed to address the needs of the poorest of the poor and the most vulnerable groups in the country.

In addition to mobilising resources for development, fiscal policy continues to be directed at raising *budgetary savings* to offset weakening in private savings so as to contribute to the external current account deficit. This was achieved through closer monitoring of Government expenditure and more effective management policies, enabling budgetary savings as a ratio of GDP to increase. This improved the liquidity position of banks which, inturn, led to increased credit to the manufacturing, retailing and agricultural sectors of the economy.

In the financial sector's structural programme, it was recognised that the soundness of the financial sector was crucial for the development of the real or productive sector. With the assistance of the World Bank, the extent of the non-performing loans on the books of the Commercial Banks was determined and the Non-Performing Assets Recovery Trust (NPART) was created to take over the bad loans. In addition, the Central Bank also needed to be recapitalised primarily because of exchange rate loses that had accumulated since 1983. In both cases, government assume ultimate responsibility for making the interest and amortisation payment on the bonds that were used to replace the non-performing commercial bank loans and the exchange rate loses of the Bank of Ghana. Non-Performing Assets Recovery Trust transfers increased from ¢4.8 billion in 1991 to a peak of ¢6.5 billion in 1994 and fell to ¢4.7 billion in 1996. Divestiture receipts rose from ¢117.4 billion in 1993 to a peak of ¢266.9 billion before declining to ¢175.6 billion in 1996.

During 1997 fiscal year the government programme of deficit reduction and improved management of government expenditure was given a further boost. In its policy statement

government indicated its desire to improve upon the fiscal and monetary performance so as to further reduce inflation. *Thus* government projected a budget surplus of ¢191.2 billion. At the National Economic Forum it was realised that the projected surplus was not attainable. However, the Forum agreed on the importance of fiscal prudence to national development efforts, consequently it prescribed a 4-year period for the complete elimination of the budget deficit. The major fiscal policy measures embarked upon are:

(d) ***Revenue***

iv. The government made efforts to widen the tax net and minimise the incidence of tax evasion through the review of exemptions and the zero rated items list;

iv. Revision upward of user fees and charges in respect of the following:

passport and other travel documents

road, bridge and ferry tolls

registration of marriage under the marriage ordinance

registration of business name and partnership and fees chargeable under the companies code

iv. Introduction of new levies in the timber sector as per the Trees and Timber Amendment Bill;

iv. Presentation of the value added tax bill to parliament;

iv. Extension of the service tax to cover professional service charges and mobile telecommunication services at a rate of 10 percent;

iv. Completion of preparatory works for the issue of new taxpayer identification numbers;

iv. Provision for tax courts;

iv. A new system of collection of tax on lotteries began in September, 1997.

iv. An enhancement of the issue of Treasury Credit Notes to cover all public and donor-funded projects. This is to eliminate the abuse of the duty-free facility for this category of imports;

iv. An expansion of the tax audit system;

(b) Expenditure

iv. The finalisation of an inventory of domestic debt arrears owed to government and the institution of collection procedure;

iv. An imposition of a moratorium on non-concessional borrowing;

iv. In an effort to minimise the over charging of government through limited purchases a new procedure was introduced for procuring items which could not be subject to formal tender procedures;

iv. Balances on all government accounts maintained at commercial banks were transferred to Bank of Ghana.

2.5 MONETARY POLICY

During the ERP restrictive monetary policies were pursued to curb inflation. The reduction in the budget deficit coupled with the use of some indirect instruments of monetary control, such as open market operations, stabilized the monetary base of the economy. The government of Ghana had substantial external financial support which was used to finance public investment in 1988 and 1989. From 1989 through 1991, domestic credit policy was tightened to offset the growth in foreign assets. The fiscal surplus generated in 1989 was used to repay government's debts to the Bank of Ghana. Repayments were increased in the subsequent years and domestic credit extended by the Bank of Ghana declined. Government no longer has unrestricted access to base money. However, except in mid 1991 when Bank deposits and lending rates became positive, monetary policy in Ghana has been less successful

in restoring positive real interest rates. High monetary growth rates in Ghana have persisted for a long time. During 1991-96, broad money supply increased at an average rate of 40 percent per annum. The main force behind the sharp annual increases in money supply continued to be government deficit financing. The high rates of monetary growth led to a build-up of excess liquidity in the economy. This contributed to fuel inflationary pressures, with inflation averaging about 37 percent per annum during the period. Effort to control monetary expansion in order to minimize its inflationary effects had generally proved ineffective. This was due to prevailing constraints to monetary management as well as emergence of new difficulties.

Monetary management in 1997 *continued* to rely on the use of interest rates, open market operations and reserve requirement as instruments. In the course of the year, different measures were introduced which were intended to lead to contraction in the supply of real balances in the system. (i) In March 1997, the reserve requirements of the commercial banks were changed to include foreign currency deposits, and the cash reserve ratio was reduced from 10 to 8 percent of total deposits. The increase in the required reserves was expected to constrain the banks in their money creation operations, and hence put a squeeze on the money supply. (ii) In September 1997, the President announced at the National Economic Forum a government directive for all government accounts to be moved from the commercial banks to the central bank. This is to deter the banks from using government funds to purchase Treasury bills as well as to limit their ability to create credit. (iii) Throughout the year, the Bank Rate of the central bank remained fixed at 45% in spite of continuous declines in the officially released rates of inflation. Consequently, no signal was provided to the banks to reduce their rates on advances, although anecdotal evidence suggests that lower than Treasury bill rates were charged to prime borrowers at some banks. (iv) Since the last quarter of 1997, the Bank of

Ghana has come down hard on foreign currency operations in the country. First, there was a clamp down on the activities of some forex bureaux suspected of engaging in illegal money transfers. These bureaux were forced to close down and their licenses withdrawn. Secondly, the Bank of Ghana has been using the Exchange Control Act 1961 (Act 71) to pronounce on the illegality of the use of foreign currencies as a means of exchange in Ghana. This move by the central bank was apparently meant to curb the increasing dollarization of the economy. These two directives by the Bank of Ghana could, however, induce portfolio shifts, as foreign currencies appear to be used also as a store of wealth. The money multiplier declined from an average of 2.4 in 1996 to 2.2 in 1997. On the other hand, changes in High Powered Money were more volatile in 1997 than in 1996, on account of large government borrowing needs and changes in net foreign reserves of the Bank of Ghana. The latter was largely due to the use of the exchange rate as nominal anchor.

In spite of the greater variability, however, the trend growth of High Powered Money was lower in 1997 than in 1996. Consequently, the money creation potential was lower in 1997 than in 1996. These policies notwithstanding, the money stock in the economy at end of the year 1997 increased at the same rate (39.5%) as it did in 1996(39.6%). Arguably, without these policy-measures, the expansion in the money stock would have been higher on account of expansionary fiscal policy.

2.6 FINANCIAL INTERMEDIATION

During the ERP the government of Ghana undertook a series of financial sector reforms to improve financial intermediation. These reforms include the decontrol of the maximum term deposit rate in 1987; the decontrol of the maximum bank savings rate in 1988; the unification of bank cash reserve requirements on demand and time and saving deposits; the decontrol of

bank charges and fees; and reduction in the required bank cash reserves in 1990; and the increase in the remuneration of the bank cash deposits with the Bank of Ghana to 5% in 1991.

Despite the above reforms, financial intermediation remains very low due to low level of confidence in the banking system, insufficient competition, weak financial infrastructure. The low confidence in the banking system is the result of currency reversion, the withdrawal of 50-cedi notes from circulation, freezing of bank deposits in excess of 50,000 cedis pending investigation for tax liability, restricted bank loans for the financing of trade inventories, and the requirement that cheques must be used for any business transaction exceeding 1,000 cedis. Although all the restrictions imposed prior to the ERP have been gradually removed, public confidence in the banking system is still not fully restored. Stringent regulations introduced by the financial sector reforms made the banks more cautious about lending to the private sector until 1991 when credit controls were discarded. The financial institutions have increasingly directed their funds to the acquisition of high-return earning, low-risk government papers thereby crowding out credit to the private sector. In the light of this constraint, Paul (1990) noted that the major constraint facing the private sector in Ghana is credit availability and allocation. The small scale enterprises still depend on the informal financial sector, which finance about 45% of the private sector demand for credit.

The financial sector witnessed some developments in 1996. While institutional developments took place, a few new products were introduced, and infrastructural facilities were expanded and improved. Two new commercial banks were established in 1996, bringing the total number of banks operating in the country to 17. These were Prudential Bank Ltd. and International Commercial Bank Ltd. They are entirely privately owned with significant foreign participation. Also in 1996, the privatisation of Ghana Commercial Bank was undertaken.

he banking industry was shaken by the "A-Life Scandal" which affected three banks, namely hana Commercial Bank. Bank for Housing and Construction and Co-operative Bank. The candal involving over-exposure to a single borrower to the tune of an estimated ¢160 billion howed the weakness of the supervisory agency and the clearing system. This lending to a ingle borrower ensured that one company received as much as over 8% of total domestic redit.

One area that saw some progress in the course of the year was rural banking. The umber of banks that were operational increased to 107, of which Bank of Ghana classified 60 is 'satisfactory' and another 47 as 'mediocre'. Eighteen banks continued to be distressed and did not operate. Also in the year, four new licenses were issued for the setting up of rural banks, bringing the total number of rural banks to 129.

Developments in the non-bank financial sector in 1996 were slower than in 1995. Whereas as many as 7 institutions were licensed by Bank of Ghana to commence operations in 1995, the number fell to 3 in 1996. This brought the total number of registered non-bank financial institutions operating in the country to 29. They are made up of 10 finance houses, 7 savings and loans companies, 4 leasing companies, 2 discount houses, 2 hire purchase companies, 2 building societies, 1 venture capital funding company and 1 mortgage finance company.

Despite the growth and development of the non-bank financial institutions sector, the mismanagement of funds that Securities Discount Company Limited suffered in the course of the year painted a poor picture of capacity within the financial sector, despite reforms.

The year 1997 saw relatively little activity in the financial sector, compared to the previous five years. No new banks were licensed in 1997. However, new products/services

were introduced by some commercial banks. Notably were Barclays Bank's launching of the Barclays Akuafo Bond (geared toward encouraging the development of a saving habit among farmers), and introduction of the Business Master, a personal computer-based system, that gives large companies access to their bank accounts by logging into the bank's computer system. Standard Chartered Bank also introduced a new service in which payment of client's utility bills could be effected through the ATM. Electronic banking was also introduced in the form of a PC-based product, VISTAPRO, which enables client's to access their account balances, and also conduct banking transactions.

Five new rural/community banks were licensed, bringing the total to 132. Of this number, the Bank of Ghana classified 60 as performing satisfactorily in that they were found to be complying with capital adequacy requirement, 55 as mediocre in the sense that they were capital deficient, and 17 as distressed banks.

Six new Non-Bank Financial Institutions (NBFIs) were licensed during the year, bringing the total number of NBFIs to 32. Of the six, five were finance houses, and one a leasing and hire-purchase company.

Bank of Ghana took some measures to clean up the foreign exchange market. These included measures to check deposit-taking by forex bureaux. Also checked were the inward and outward transfer of foreign exchange and the failure to issue official receipts for transactions. As a result, a number of forex bureaux were closed down, with others being suspended from operating. Nonetheless, 32 new forex bureaux were licensed during the year. The total number of forex bureaux now stands at 434.

.7 PRIVATE FOREIGN INVESTMENT POLICY

Private foreign investment policy since independence has been ambiguous and not clearly defined. While the right hand was open to welcome foreign investment, the left was pushing it out. Officially, private foreign capital was welcome as entrenched in the capital Investment Act, and the need for it having been emphasized by the Arthur Lewis Report [2]. Nkrumah himself argued that since resources were not internally available, "it was my government's warmest wish that those with capital to invest would seek the opportunity which existed in the Gold Coast" [3]. In practice, there was tension between the desire to welcome foreign capital and other economic objectives, all of which could be described as economic nationalism, namely, socialist objectives of the Convention People's Party and Nkrumah's distrust of foreign capital as a vehicle of neocolonialism, the beginnings of promotion of indigenous enterprise under Busia, the attempts to "capture the commanding heights of the economy" under the NRC/SMC, and the encouragement of foreign enterprise under Limann. (Baah-Nuakoh,1997, p.77)

Under the Rawlings administration, all prospective investors are most welcome to take advantage of the generous incentives under a liberalized environment offered by the new investment regime-GIPC Act, 1994 (Act 478). The Ghana Investment Promotion Centre (GIPC) has been established under the GIPC Act, 1994 (Act 478) to be responsible for the encouragement and promotion of investments in the Ghanaian economy. It's functions, among others, include: (a) the initiation, support and participation in investment promotional activities; (b) collection, collation and dissemination of investment information

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2 A. Lewis, *Report on Industrialization and the Gold Coast*, June 1953, Section 93 emphasises the role of foreign capital in the industrialization process.
3 Kwame Nkrumah, *Ghana*, Nelson, London. 1959, p.129.

(c) identification and promotion of specific projects; (d) maintaining liaison between investors and Government agencies and institutional lenders and (e) provision of investor-support services. With the exception of mining, petroleum and portfolio investments, the GIPC is responsible for all other investment activities in the economy. The Ghana National Petroleum Corporation (GNPC) handles petroleum investments and the Minerals Commission handles investment activities in the mining sector. Portfolio investments are handled by the Ghana Stock Exchange.

(i) GATEWAY PROJECT

The Ghana Free Zones Scheme is an integrated Programme to promote processing and manufacturing of goods through the establishment of Export Processing Zones (EPZs) and encourage the development of commercial and service activities at seaport and airport areas. In essence, the whole of Ghana is accessible to potential investors, who have the opportunity to use the free zones as focal points to produce goods and services for foreign markets. The Ghana Programme is also completely private sector driven. Government's role is limited to facilitate, regulate and monitor activities of zone developers/operators and enterprises.

The establishment of a legal framework for the free zones and the declaration of free ports and Liberalized skies are also supposed to promote Ghana as a gateway to West Africa. So far 37 companies have been approved by the government to operate under the Free Zones arrangements, distributed as follows: 3 developers, 26 in manufacturing and 8 in warehousing and commerce. By the end of 1997 the Ghana Free Zones Board had approved 46 projects of which 3 are enclave developers while the other 43 are to operate single

enterprises. Of these, about 25 are either already operating or are in the process of starting the Free Zones.

(ii) INCENTIVES

Extensive and generous incentives have been packaged in the Free Zone Act (1995) for investors interested in developing and operating free zone enclaves and single-factory zones in Ghana. These include:

Duties-

There is total-100%- exemption from payment of direct and indirect duties and levies on all imports for production and exports from free zones.

Taxation-

There is total-100%-exemption from payment of income tax on profits for 10 years to free zone developers and enterprises. Income tax rate after 10 years also shall not exceed 8 percent. There is total exemption from payment of withholding taxes from dividends arising out of free zone investments. There is also a relief from double taxation for foreign investors and employees.

Customs-

There is no import licensing requirements and also minimal customs formalities.

Zone Ownership-

There is 100% ownership of shares by any investor -foreign or national- in a free zone enterprise. Also there is no restriction on total foreign or local ownership of free zone enclaves and enterprises.

Capital/Profit Repatriation-

There are no conditions or restrictions on the repatriation of dividends or net profit, payments for foreign loan servicing, payments of fees and charges for technology transfer agreements; and remittance of proceeds from sale of any interest in a free zone investment.

Management of Foreign Currency-

The Free zone investors are permitted to operate foreign currency accounts with banks in Ghana.

Sales to Local Market-

On the sales to the local market, up to 30% of annual production of goods and services of a free zone enterprises are authorized for sale in the local market.

Investment Guarantee-

The Free zone investments are guaranteed against nationalization and expropriation.

2.8 NATURAL RESOURCE POLICY

(i) Cocoa Policy: There has been a positive supply response in the cocoa sector to the price incentives and the other incentives provided under the ERP through the Cocoa Rehabilitation Project. Cocoa production increased with export of cocoa beans, rising from 254,444 tonnes in 1991/92 to 330,646 tonnes in 1995/96 crop season. The incentive to invest in new cocoa farms and replace old trees depend upon the real producer price of cocoa and the prices of competing crops. Although a World Bank/Ghana Cocoa Board (Cocobod) study suggested that the real producer price of cocoa should not fall below ¢140,000 per tonne at 1987 prices, this was not implemented. Rather, the real price of cocoa has fallen

below the suggested price since 1987. Since 1984/85 crop season, the government has adopted a farm-gate pricing policy with two new elements: (a) deliberate attempt to involve representatives of farmers in the producer price determination through the work of the Producer Review Committee; and (b) provision of estimates of farmers' cost of production as well as projected earnings on sale of the produce before arriving at a producer price.

Recently, the government has come out with a third dimension which aims at raising the producer price, at least to 60% of the annual projected f.o.b. prices by the year 2000. During the 1995/96 season, an average of 37.58% of the world price (f.o.b.) was passed on to the farmers as producer price. In its Corporate Plan (1987), Cocobod set a target to reduce its operational costs to about 15% of the f.o.b. price of cocoa. This target has not been achieved as the costs are slightly above 20% of the f.o.b. price. In the face of dwindling world cocoa price, efficient methods of buying cocoa and selling abroad should be explored. The high cost of purchasing cocoa on the domestic market should be reduced so that more of the f.o.b. price can be passed on to the farmer. One way of doing this is to divest Cocobod of many of its activities that are not directly related to buying and selling of cocoa. The decision to allow the private sector (Licensed Buying Companies (LBC)) to participate in the internal marketing of cocoa is a step in the right direction. i.e introduction of competition in the internal marketing of cocoa.

As far as government policy on cocoa was concerned two objectives have been aimed at; (i) Improving incentives for farmers by raising the purchase price, and (ii) lowering the cost of Ghana Cocoa Board. The two objectives were closely related, as cost saving was used to raise the farmers share of the F.O.B. price. In June, 1990 the government announce an

increase in the producer price and then eliminated all subsidies on input to production. The net effective nominal increase in the price for farmers was about 22%.

In recent times the government policies towards improving the Cocoa sector include the following: (a) increasing the farmers share of the earnings of Cocoa exports (b) the privatization of all commercial activities under Cocoa Board. These include: (i) local processing of Cocoa i.e. the privatization of the cocoa processing factories. (ii) internal marketing of cocoa i.e. the privatization of the Produce Buying Company and the licensing of other cocoa buying companies such as Caspro ltd., Adwumapa ltd. etc. (iii) commercialization of the health Unit and the quality control division of the Cocoa Board. (c) A unified extension system under the Ministry of Agriculture which is on the way. (d) the privatization of input supply to Cocoa farmers and (e) the removal of all subsidies to the cocoa industry.

(ii) Mining Policy: The mining policies are stipulated in PNDC Law 153 (Minerals and Mining Law 1986). The law requires that royalty payable by a mining entity to the traditional owners of the land "shall not be more than 12% or less than 3% of the total revenue of minerals obtained by the holder from his mining operations". A holder of mining lease shall pay income tax at the rate of 45%. The holder of mining lease shall, where qualified, be entitled to the following capital allowance: (a) depreciation or capital allowance of 75% of capital expenditure incurred in the year of investment and 50% in subsequent years: (b) losses in each financial year not exceeding the value of capital allowance for the wear and tear may be carried forward. The holder of a mineral right shall be granted the following benefits as appropriate: (a) exemption from payment of customs import duties in respect of plant, machinery, equipment and accessories imported specifically and

exclusively for the commencement of the mineral operations and may, after establishment, receive additional relief from payment of customs and excise duties as provided in the mining law; (b) immigration quota in respect of the approved number of expatriate personnel.

Where the holder of a mining lease earns foreign exchange from the mineral operations, it may be permitted by the Bank of Ghana to retain in an external account not less than 25% of the foreign exchange earnings for use in acquiring spare parts and other inputs required for the mining operations which would otherwise not be readily available without the use of such earnings.

The passage of the Mineral and Mining Law has brought about a sustained increase in the production and export of minerals, especially gold. The earnings from minerals have risen from about $124.4 million in 1986 to $641.3 million in 1996, representing an increase of 415.5 percent over the decade. The remarkable growth in the mining sector was due to the rehabilitation exercise carried out by most of the mines and the conducive environment created by the government to attract private sector investment in small-scale mining through the PNDC Law 153.

Further expansion in mining can be realized if the current policy of selling gold and diamonds through a government agency is decentralized as it is done in the cocoa industry so that accredited individuals and firms can participate in the domestic marketing of gold and diamonds. It is expected that when this is done, the price of the minerals will rise higher than it is currently and it will induce a positive supply response.

(iii) Forest and Wildlife Policy: The main policy of the forestry sector is the forest and wildlife policy of 1994. The policy aims at the conservation and sustainable development of

the nation's forest and wildlife resources for maintenance of environmental quality and perpetual flow of optimum benefits to all segments of society.

A comprehensive plan of action to guide the implementation of the policy objectives and key strategies up to the year 2020 was developed and launched in 1996. This was known as the Forestry Development Master Plan (FDMP). The FDMP stressed that the current condition of the forest resource base was such that the annual sustainable harvest had to be restricted to a maximum of one million cubic metres for the foreseeable future, if the species base were not broadened. This annual cuts has to satisfy: (i) a timber industry that is characterized by excess installed capacity and low recovery rates, mainly focused on exporting to a hardening market place; and (ii) an increased rate of domestic consumption of wood products, largely supplied from illegal sources.

The aim of the FDMP is to serve as a basis for achieving (i) sustainable utilization and development of forest and wildlife resources; (ii) modernization of the timber industry ; and (iii) conservation of the environment, and thereby ensure realization of the objective of the forest and wildlife policy.

The FDMP has started showing results from 1996. Earnings from timber and timber products exports which had been increasing since 1986 from a low of $44.1 million reached a high of $1990.6 million in 1995 and fell by 92.6% in 1996 to $146.86 million. Similarly, the volume exported declined from a high of 780,000 cubic metres in 1994 to 590,000 cubic metres in 1995 and then declined further by 38.2% to reach 364,771 cubic metres in 1996.

9 LESSONS FROM STATISTICS AND POLICIES:-

First, ERP has helped to restore macroeconomic stability in Ghana.

Also, the policy of making foreign exchange available to the private sector for the importation of inputs and thereby enhance private investment has also seen some success.

Thirdly, the comprehensive expenditure reform program aimed at reducing government involvement in activities that can be carried out by the private sector in a cost effective manner has also been successfully implemented with the introduction of the privatization programme.

Monetary policy in Ghana has not worked because it has been less successful in restoring positive real interest rates.

There is the need for more attractive locational incentives to attract foreign investment to the deprive areas. Also, difficulties in gaining access to land and permits for expatriate workers, combined with other requirements for permits and approvals, together constitute a formidable set of barriers to investment. When the number of approvals, is combined with complicated processes and inefficient or even antagonistic officials, the magnitude of the problem becomes evident. There is the need to liberalize the treatment of expatriate staff. One approach adopted by Malaysia a number of years ago, is to allow automatically a reasonable number (five in the case of Malaysia) expatriate personnel for each investment, with the number increasing with the size of the investment. Also approval process for foreign personnel need to be streamlined and time period for visas

and work permits lengthened. A step has to taken by the government to centralize

administration of the approval process by designating one agency to coordinate approvals[4] . A more politically daring step, and hence more rare, is to actually centralize the power to make the decisions. The most effective way of reducing administrative barriers, however, is actually to eliminate steps, and improve the functioning of the institutions that administer the remaining steps. This is the route taken by virtually all countries successfully attracting and implementing large amounts of FDI.

There has been a positive supply response in the Cocoa sector to the price incentives provided under the ERP through the Cocoa Rehabilitation Project. The decision to allow the private sector to participate in the internal marketing of Cocoa is a step in the right direction because it has promoted competition and efficiency in the internal marketing of Cocoa in Ghana.

The implementation of the Mineral and Mining law has brought about a sustained increase in the production and export of minerals, especially gold. Also, the rehabilitation exercise carried out by most of the mines and the conducive environment created by the government to attract private sector investment in small-scale mining through the PNDC law 153 has contributed immensely to the remarkable growth in the mining sector.

For more expansion in mining sector there is the need to decentralize the current policy of selling gold and diamonds through a government agency as it is done in the cocoa industry so that accredited individuals and firms can participate in the domestic marketing of gold and diamonds. This will raise the price of minerals and induce a positive supply response.

4 See Louis T. Wells Jr. And Alvin G. Wint, Facilitating Foreign Investment, FIAS Occasional Paper #2 (Washington, the World Bank, 1991), Chapter 3, pp.20-29.

There is the need to revise the Land Policy in Ghana to reflect current investment trends and also to avoid the number of land litigation pending in courts. The Forestry Development Master Plan has also started registering results from 1996 as earnings from timber and timber products exports had been increasing while the volume exported has also declined.

2.10 POLITICAL INSTABILITY AND FOREIGN DIRECT INVESTMENT IN GHANA

During the 1950s, an Industrial Development Corporation was established which set up a number of publicly-owned commercial enterprises. The government had taken the view that these would be sold to private operators after they had become viable. However, Nkrumah changed his mind by asserting in 1960 that his government would henceforth "place far greater emphasis on the development of Ghanaian cooperatives rather than encourage Ghanaians to start private business enterprises," and that state enterprises would not be handed over to private interests. In responding to the demands by Ghanaian private businessmen for better opportunities and various kinds of assistance, the Nkrumah government frequently expressed its good intentions and in 1958, the government set up a committee to investigate the best means of assisting Ghanaian businessmen to overcome their difficulties (Esseks, 1971, p. 13). However, Nkrumah became disillusioned with these efforts because he believed that there was little realistic prospect of fostering an indigenous entrepreneurial class capable of industrializing at the speed and scale he wanted. Another reason was ideological ----he thought that the country would be hampering her advancement to socialism if Ghanaian private capitalism were encouraged (Killick, 1978, p.37). There is

also some evidence to the fact that he feared the threat that a wealthy class of Ghanaian businessmen might pose to his political power (Killick, 1978 p.60). However, many small traders had supported Nkrumah's Convention People's Party (CPP) in the 1950s and thus were owed economic rewards. As a compromise, Nkrumah decided that Ghanaian private enterprise would be limited to small-scale concerns, as long as they were not nominees or partners for foreign interests. Its existence was to be contingent upon its willingness to operate within the socialist framework, but the opportunities for Ghanaians to operate small-scale businesses were to be enhanced by restricting foreigners in this type of activity.

While his attitude toward local private enterprise was made clear in the early 1960s, his views on foreign private investment remained questionable. He urged the need for foreign direct investment, arguing that it brought in much needed managerial and technical skills which could be passed on to Ghanaians. A capital Investment Act was passed in 1963, offering a wide range of fiscal and other concessions to would-be investors. But there were strings attached as indicated by Nkrumah "The government accepts the operation in the country of large-scale enterprises by foreign interests, provided that they accept the following conditions: first, that foreign private enterprises give the government the option to buy their shares, whenever it is intended to sell all or part of their equity capital; and secondly that foreign private enterprises and enterprises jointly owned by the state and foreign private interests be required to reinvest 60% of their net profits in Ghana." (Nkrumah, in Friedland and Rosberg (eds.), 1964, p.271). He reiterated that no foreign investor would be allowed to interfere with the domestic or external affairs of the country. Although he insisted that socialism could coexist with private enterprise, he made pronouncements against neocolonialism. His government starved the private sector of

imported raw materials, spare parts and equipment, and used exchange controls to prevent the repatriation of after-tax profits (Killick, 1978, p.38). There was little success during the period in attracting foreign direct investment. It appears that the main justification for state intervention in the economy at the expense of private enterprise in the Nkrumah era is the fact that there seemed to be no alternative if industrialization was to proceed at the required speed and magnitude, for indigenous enterprises could not do so alone and leaving it to foreign investors would leave the country at the mercy of neocolonialists (Nkrumah, 1970, ch. 14).

Both the National Liberation Council (NLC) (1966) and Busia governments (1972) claim to pursue more open policies, making more serious efforts to secure inflows of long-term public and private capital and embarking on what has been called " an experiment with import liberalization" (Leith, 1994, ch. 5). Both governments rejected Nkrumah's socialism and made various pro-private enterprise statements. The NLC stated that the encouragement of private enterprises was one of its basic objectives, and the election manifesto of Busia's Progress Party affirmed its support for and confidence in private enterprises. (Killick, 1978, p. 311). Although both governments stated that they wanted more foreign private investment, the major thrust was one of assisting domestic business— a theme which emerged during the NLC period and received greater emphasis under the Progress Party. The NLC passed a decree setting out a timetable for Ghanaianization, and the Busia government supplemented this with further legislation which accelerated the programme[5]. Various types of special financial assistance were also provided for small-scale Ghanaian businesses.

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5 Ghanaian enterprise Decree, No. 322 of 1968, and the Ghanaian Business (Promotion) Act of 1970, Killick, 1978, p. 325, Footnote 56

However, there was little change in the degree of state participation in economic activities during the NLC/Busia era. Out of 53 public enterprises and corporations that existed at the end of 1965, 43 remained wholly state-owned at the end of 1971 and 5 new ones had been created. (Killick, 1978, p.313). Also the 1966 coup that toppled Nkrumah's government may have created political uncertainty especially in the initial years of the NLC government which may have acted as a constraint to private investment.

The National Redemption Council (NRC)/Supreme Military Council (SMC) era of Acheampong and Akuffo (1972-1979) was characterized by a return to a command economy a resumed expansion of the state in economic activities[6] . The political uncertainty that surrounded the coup that toppled the government of Dr. Busia and brought in the National Redemption Council (NRC) led by Col. Acheampong may have spilled over to the following year. Again, in 1975 there was a palace coup which resulted in the change over from National Redemption Council (NRC) to Supreme Military Council (SMC). Between 1977 and 1979, there were four political events: a palace coup (1978), an attempted coup and a successful coup, both led by Flt. Lt. Rawlings, and general elections in September, 1979, won by Dr. Limann's People's National Party. All these political turbulence may have created a climate of uncertainty and acted as a depressant to private investment.

The Acheampong government, widely recognised as disastrous for the country, is most vividly remembered for its institution of corruption on a massive scale and for the "Union Government" (UNIGOV) experiment [7] . Realizing the need to regain some kind of legitimacy for his ailing government, but unwilling to release the reigns of power,

6 In 1975, the service commanders seized the initiative and forced through a change in the structure of the NRC. The SMC which replaced the NRC contained the service commanders of the military stations as well as the Inspector General of Police (IGP).
7 Shillington, 1974, p.22

Acheampong sought to devise a new constitution which would guarantee a permanent place for himself and the military in the government of the country. In January 1977, Acheampong set up an ad hoc committee to sound out opinion and draw up specific proposals for the UNIGOV concept. The National Union of Ghana Students (NUGS) and the general student body were the most vocal ;critics of the scheme. In may 1977, there were demonstrations in all the three universities demanding the immediate resignation of Acheampong. The universities were closed down, re-opened briefly in June and closed down again when the students went on demonstration. The Association of Recognized Professional Bodies (representing lawyers, doctors, university teachers) and Christian Council of Ghana also called for the resignation of the SMC. The Acheampong era was characterized by strikes and a general atmosphere of political instability. By Mid July 1977, the country was grinding to a halt. Acheampong conceded that he would hand over power to a civilian government by July 1, 1979 but did not give up the UNIGOV idea. He decided to put it to a referendum on March 30, 1978. It was clear that the concept would not win a majority support . This prompted Acheampong to intervene. The official regulations for the referendum stated that counting of votes would take place at individual polling stations, as soon as voting was completed. But on polling day itself the SMC issued a directive on the radio ordering that the ballot boxes were to be collected up and taken to regional centres for counting. The electoral commissioner, Justice I.K. Abban bravely challenged this in writing, denouncing it as illegal. He was promptly sacked. When the following day the state-owned press announced that UNIGOV had been approved by 54% to 46%, nobody believed it, especially since the announcement was accompanied by widespread arrests.

On July 5, 1978, a small group of soldiers isolated Acheampong from his bodyguard and forced him to sign his own resignation. Lt. Gen. Akuffo who took over announced that he would stick with the UNIGOV idea. He came under increasing attack from the same groups which opposed Acheampong. There were widespread strikes and demonstrations. The same political instability characterized the Akuffo regime. In December 1978, Akuffo announced the setting up of a constituent Assembly to draw up a constitution, and abandoning all hopes of imposing UNIGOV.

Under the regime of Rawlings I (1979) and II (1981-83), there was extreme repression and control of private sector activity and also under the Limann government. During the period of the PNDC (I and II), the economic climate has been clouded by official actions that have posed serious threats to private businesses. Properties have been seized and people's lifetime savings have been confiscated because they have carried out " an act with the intent to sabotage the economy of the state". Among Ghanaian business people, the terms often used to describe the business environment include "mistrust", "harassment", and "the absence of support" (Leechor, 1994, p.177). After the introduction of the ERP, despite more liberal economic policies and rhetoric giving private sector a leading role, the attitude of government has remained somewhat hostile to the private sector. The government of the PNDC has made anti-private sector statements. On June 4, 1993, the head of state used the presidential platform to attack certain private Ghanaian investors for having contributed towards the financing of their political parties.

For the period 1983-96, there has been a hectic investment promotion activity by the Rawlings Civilian administration in Ghana. There has therefore been a series of investment promotion tours by the government to various countries such as USA, France

Japan, Britain, etc. At such tours the policies of the government towards attracting both local and foreign investors are explained. The investment code has also been revised which has resulted in the passing of the GIPC Act, 1994 (Act 478) and also the establishment of the Ghana Investment Promotion Centre to encourage, promote and coordinate investments in the Ghanaian economy. Sound macroeconomic environment has also been created to attract more foreign investors into the Ghanaian economy. An example is the establishment of the Gateway project with its special incentive packages to facilitate private investments in Ghana. The continuous political regime headed by Rawlings through the various metamorphosis has also promoted investor confidence in Ghana.

2.12 MEASURES TO IMPROVE THE INVESTMENT CLIMATE

Investment incentives have been provided under investment codes. The first was the Pioneer and Companies Act of 1959. This was followed by the Capital Investment Act of 1963 (Act 172) which sought to encourage foreign investment. The 1973 Investment Decree (NRCD 141) and Investment Policy Decree NRCD 329 of 1975 unlike the 1963 Act was to encourage both local and foreign investors. The 1981 Investment Code (Act 437) sought to centralize investment promotion functions at the Capital Investment Board and consolidate all investment legislation. The 1985 Investment Code (PNDCL 116) establish the Ghana Investment Centre as the central Investment Promotion Agency.

All these investment codes have attempted to provide a favourable investment climate by offering incentives to boost private investment. The incentives generally provided include tax holidays, accelerated depreciation allowances, exemption for import duties on machinery and equipment, investment allowances and arrangements for profit repatriation. The need to constantly review the code reflects the lack of appropriate response to the various codes.

Measures that have been taken since 1994 when the investment code was revised to improve the investment climate include (a) gradual removal of administrative and other bottlenecks, (b) review of the tax structure as it relates to private investment, e.g., reduction of corporate tax to 45% maximum (1991) from 55% previously, for some enterprises, (c) establishment of retention accounts (and foreign accounts) for individual companies for retention of portion of revenues earned from exports to finance imports of essential spare parts and raw materials or machinery, and credit expansion in 1987 and 1988 to ensure adequate financial support for the priority sectors of the economy, and (d) liberalization of the financial system.

On April 29, 1988, Ghana ratified the convention establishing the Multilateral Investment Guarantee Agency (MIGA) of the World Bank. MIGA aims at encouraging equity investment and other forms of direct foreign investment (DFI) in developing countries, by reducing non-commercial risk. This is done through investment guarantee operations and the provision of advice and technical assistance to governments of developing countries on investments and programmes. In effect, the MIGA convention seeks to provide an insurance cover for foreign investors, who participate in eligible investments in the productive sectors of the economy of developing countries. Despite this assurance of Ghana's investment guarantee under the Investment Code and the MIGA convention, some countries still insist on Bilateral Investment Promotion and Protection Agreements (IPPA) with Ghana. A number of such IPPA's have been signed with countries like the United Kingdom, the Netherlands, Rumania, and China (see Ghana Investments Centre, 1991).

Tax rates remain high in Ghana. A number of initiatives have also been taken by the government in the last few years to reduce the tax burden on companies and investors to

leave more resources in their hands for reinvestment. In the 1988 budget, the corporate tax payable by the manufacturing, farming, and export sectors was reduced from 55% to 45%. In the 1989 budget, the corporate tax rate was reduced from 55% to 50% for all other corporate bodies except companies operating on banking, insurance, commerce and printing. In the 1990 budget, the tax on companies in construction was lowered from 50% to 45%. In the 1991 budget, corporate income tax was lowered from 45% to 35% for all sectors, except for mining which has its special tax regime. The dividend withholding tax was lowered across the board to 5%, except for minor exceptions designed to discourage speculation. In the case of publicly traded shares, mergers, and acquisitions, there was a complete waiver of the capital gains tax. In the 1992 budget statement, the corporate tax for commerce, printing, and publishing was reduced from 50% to 35%. Among the taxes abolished were import and sales taxes on building materials.

A bill, "The Ghana Investment Promotion Center Act, 1993" has been established for the encouragement and promotion of investment. The objective of the bill is to revise the 1985 Investment Code to place more emphasis on private sector investments as an important segment for accelerated economic growth and to consolidate recent amendments to the code. According to the bill, the existing code is regulatory oriented and does not encourage the investment center to engage in promotional activities.

2.4 FISCAL CONCESSIONS AND OTHER INVESTMENT INCENTIVES UNDER THE NEW INVESTMENT CODE.

Tax and investment incentives as used in many countries, developed and developing, are geared towards the realization of two main objectives; firstly, they are intended to redirect private investment towards priority areas and, secondly, the incentives are expected to lead to an increase in new investments and/or expansion of already existing

apacities. In many developing economies, as a result of alleged shortage of capital, many these measures have been effected to attract private capital from abroad as well as from ithin. The investment incentives have usually taken the form of tax exemptions.

The case for fiscal concessions, in general, rests on two principal assumptions. rstly, it is argue that tax concessions provide an important stimulus to both foreign and mestic investment in industrial enterprises by (a) raising the net rate of return on capital vestment through exemption from income, property, sales and import taxes on raw aterials, (b) reducing the cost of investment through exemption from import duties on pital goods. Secondly, it is assumed that the revenue that the government sacrifices as a ult of the exemption is only temporary since it will eventually be made up by tax venues from investments which the tax exemption policy promoted.

INCOME TAX INCENTIVES

Income Tax Incentives Provided under the Income Tax Decree, 1975 (SMCD5) as ended under the new investment regime-G.I.P.C Act, 1994 (Act 478)- include:

ax Holiday (from start of operations) are:

(a) **Real Estate:** Rental income from residential and commercial premises - the first 5 years after construction. In accruing to a company engaged in the construction, sale or letting of residential premises - during the first 5 years of start-up of operations.

(b)**Rural Banks** : They have 10 years tax holiday from start of operation.

(c) **Agriculture & Agro - industry**:

Cocoa farmers & producers are exempted from income tax. Cattle ranching attracts a tax holiday of 10 years. Tree crops (eg. Coffee, oil palm, shea butter, rubber &

coconut): are also given a tax holiday of 10years. For Poultry, Fishing & Cash Crops they are given a tax holiday for 5 years from the start of operation.

(d) Air and Sea Transport (non-resident):

They are Income Exempted.

Also the President may *exempt* any persons or class of persons from all or any provision of the Decree subject to the approval of Parliament.

apital Allowances:

(d) Depreciation (accelerated) allowance applicable to all sectors except banking, finance, commerce, insurance, mining and petroleum.

Qualifying Plant Expenditure: Depreciation rate of 50% per annum for 2 years.

Qualifying Building Expenditure: Deprecation rate of 20% per annum for five (5) years.

All Sectors which enjoy Income Tax Incentives accelerated deprecation allowance do not enjoy annual allowances.

(d) Qualifying (normal) allowance applicable to banking, finance, commerce, insurance, mining and petroleum and to be enjoyed *only once* in the year of assessment for which the asset is *first used by owner of asset;*

Qualifying Plant Expenditure: Depreciation allowance of 20%

Qualifying Building Expenditure: Deprecation allowance of 10%

Qualifying Mining Expenditure: Depreciation allowance of 25%

(NB * Depreciation allowance for Plantation is 10%)

(d) Annual allowance applicable to banking, finance, commerce, insurance *after* the enjoyment of the depreciation allowance referred to in (b) above:

Machinery: Annual allowance at the rate of 10%

Plant : Annual allowance at the rate of 71/2%

Furniture, Fixtures and Fittings: Annual allowance at the rate of 71/2.

Buildings (excluding residential property): Annual allowance at the rate of 5% for mining and timber and 3% for other sectors.

Ships, trawlers Ferry Boats, Lighters and tugboats, Barges, Dredges and Pontoons: Annual allowance at the rate of 5%.

Aeroplanes and Helicopters: Annual allowance at the rate 10% for aeroplanes and 71/2 for helicopters.

(B) Qualifying mining and timber expenditure: Annual allowance at the rate of 15%.

Location Incentives (Tax Rebate)

Manufacturing industries located in regional capitals other than Accra and Tema attract rebate of 25%.

All other manufacturing industries located outside regional capitals attract rebate of 50%.

3. **Corporate Tax Rates**

It is 35% in all Sectors except, (1) Income from non-traditional exports which is 8% and (2) Hotels which is 25%.

5. **Exemption from income tax payable**

There is exemption from income tax payable on the provision of accommodation for employees on farms and building, timber, mining and construction sites.

Loss - Carry - Over:

It is applicable to all sectors for 5 years, except insurance business which is unlimited.

Exempt from the Minimum Chargeable Income Tax

There is also an exemption from minimum chargeable income of 5% turnover during the st five years of operation...

A Capital Expenditure for Research and Development

A Capital Expenditure for Research and Development by manufacturing company in hana is (approved by the Minister of Trade and Industry) fully deductible.

Withholding Tax

(a) The withholding tax rate on dividends is 10%.

(b) The withholding tax on royalties, management and technology transfer fees is 15%

(c) The withholding tax rate on interest has been reduced from 30% to 10%.

2.14 TRENDS IN FDI IN GHANA

The trends in FDI growth has been illustrated by figure 2.1 below

he plot of the growth rate of FDI on the vertical axis and years on the horizontal axis, hows that there has been wide fluctuations in the growth rate of FDI in Ghana.

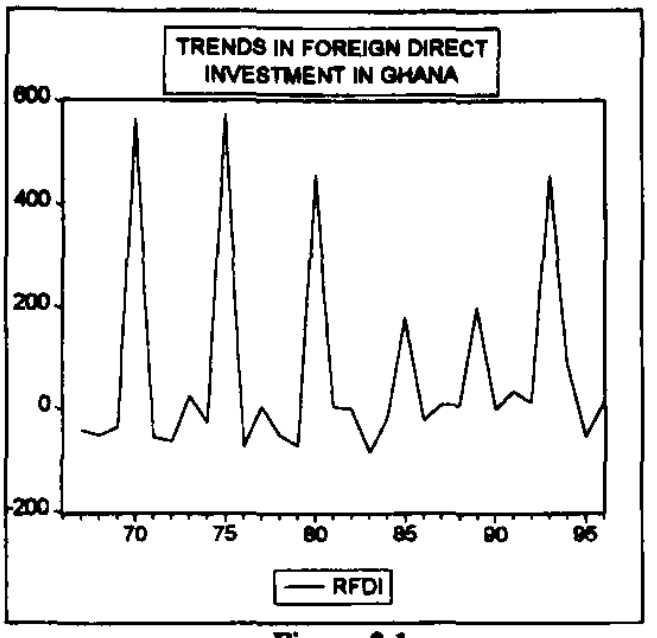

Figure 2.1

From 1966 to 1969, the growth rate of FDI was about -50%. The growth rate of FDI increased from about -50% in 1969 to about 550% in 1970. From 1971 to 1973, the growth rate of FDI increased from -50% to 10% and then declined to about -30% in 1974. In 1975, the growth rate of FDI shot up to about 550% and then decreased to -70% in 1976. It rose again to about 0.0% and declined to about -70% in 1979. From 1979 to 1980, the growth rate of FDI increased to about 450% and then declined to about 0.0% in 1981 and fell further to about -100% in 1983. From 1983 to 1984, the growth rate of FDI increased to about 180%, fell to 0.0% in 1986 to 1988 and the rose again to about 200% in 1989 From 1990 to 1992, it was about 0.0% and then rose to about 450% in 1992 to 1993. In 1995, the growth rate of FDI declined to about -50% and started rising from 1995 to about 0.0% in 1996.

2.15 TRENDS IN GDP IN GHANA

Figure 2.2 above shows the trends in growth rate of real output in Ghana.

There has been tremendous fluctuations in the growth rate of real output in Ghana. From 1966-68, the growth rate of real output rose to about 6% and in 1969 it went down to about 5% and rose again to about 7.5% in 1970. From 1970 to 1972 it fell to about -1%. From 1972 to 1973, the growth rate of real output increased to about 17.5%. This can be attributed to Acheampong's 'Operation Feed Yourself' which led to a tremendous boost in agricultural output and then it fell to about -12% in 1975. From 1975, the growth rate of real output started rising and peaked at about 5% in 1977 and then declined in 1979 to about -5%. It then rose to 0.0% in 1980 and declined again to about -7.5% in 1982. It increased to about 5% in 1985.

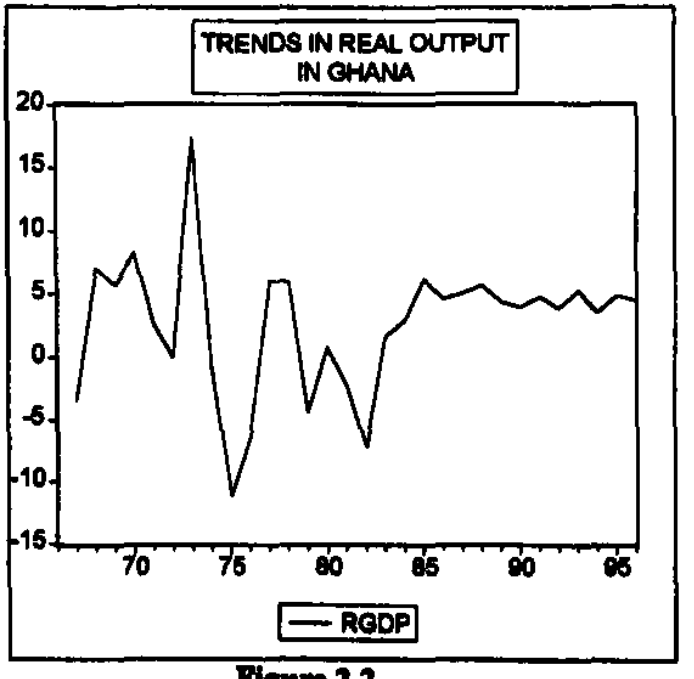

Figure 2.2

From 1985 to 1996 the growth rate of real output fluctuated around 5% on the average. This can also be attributed to the ERP started in 1983 which has created sound macroeconomic environment and also the relative political stability enjoyed by the country over the last two decades.

2.4 TRENDS IN EXCHANGE RATE IN GHANA

Figure 2.3 below depicts the trend in the growth rate of exchange rate in Ghana. The growth rate of exchange rate in Ghana was relatively stable between 1966-1970. In 1971, there was an increase in the growth rate of exchange rate to about 50%. In 1972, the growth rate of exchange rate declined to about -50%. From 1972 to 1977, the growth rate of exchange rate was relatively stable at about -50%.

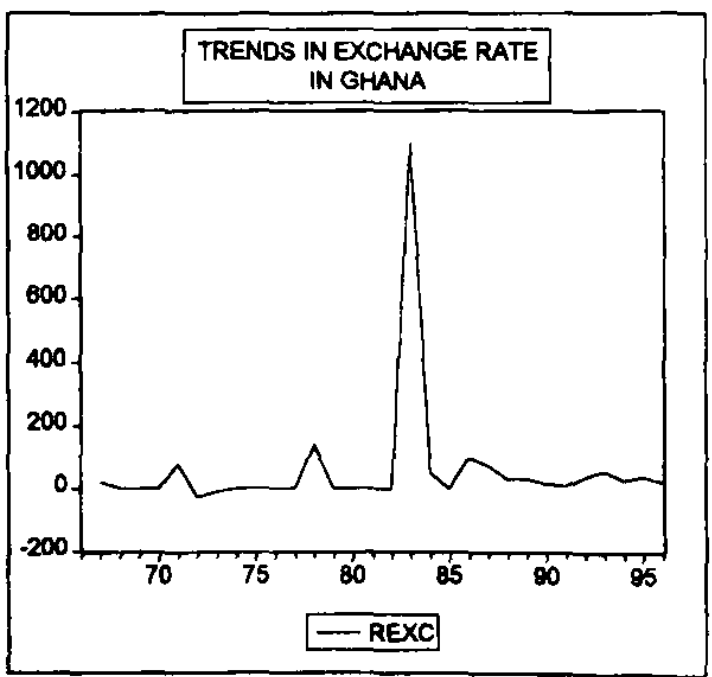

Figure 2.3

In 1978, the growth rate of exchange rate rose to about 100% and then decreased to about -50% in 1979. Between 1979 and 1982 the growth rate of exchange rate was stable at about -50%, rose to about 1100%. This can be

attributed to an increase in demand for foreign exchange to import food items to supplement local production due to the severe drought experienced in 1983 in 1983. It then fell to about -50% in 1985. It rose again to about 50% in 1986. From 1986-1996, the growth rate of the exchange rate fluctuated around 50%. This can be attributed to the tightened financial policies and strengthened supervision of the banks and Forex Bureaux by the bank of Ghana.

2.17 TRENDS IN NATURAL RESOURCES IN GHANA

The growth rate of natural resources in Ghana has been illustrated in figure 2.4 below. From 1966-1986, the growth rate of natural resources rose to about 30%, fell to about 20% in 1969 and rose again to 30% in 1970. In 1971, it fell to about -50% and then increased to a peak of about 35% in 1973. From 1973-76, it declined to about -20% and then increased to about 90% in 1979. From 1979, there was a sharp drop in the growth rate of natural resources to about -60% in 1981. From 1981, there was a sharp increase in the growth rate of natural resources to about 480%, it dropped to about 50% in 1985 and then increased to 140% in 1986.

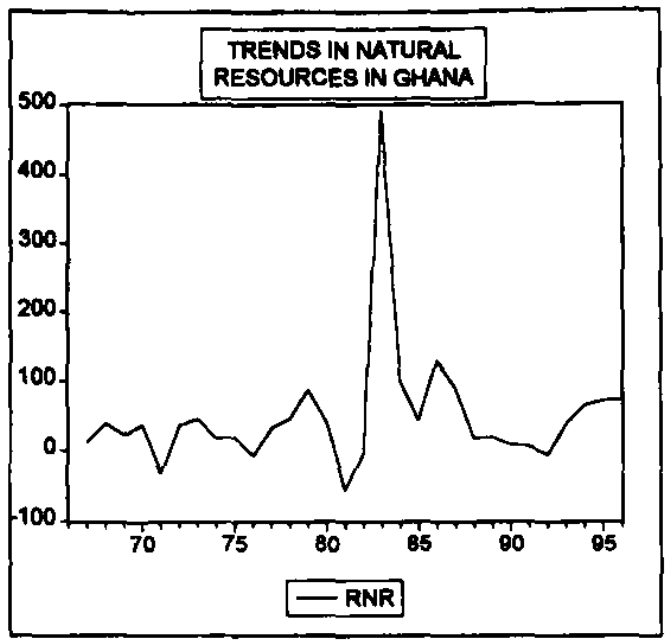

Figure 2.4

From 1986, it declined to about 0.0% in 1988 and declined further in 1992 to about -20%. From 1992 to 1996, there has been a steady increase in the growth rate of natural resources to a peak of about 50% . This can be explained by the introduction of the ERP launched in 1983 which has led to an improvement in harnessing of natural resources in Ghana.

2.18 TRENDS IN INFLATION IN GHANA

The trends in the rate of inflation in Ghana has been illustrated by the graph in figure 2.5 below. From 1966-1968, the rate of inflation increased from about -5% to 5%. It declined to about 0.0% in 1970, rose to about 20% in 1970 and increased to about 120% in 1977. This sharp increase in the rate of inflation can be attributed to fiscal indiscipline by the S.M.C. government. From 1977, it declined to about 20% in 1979 and rose again to a peak of about 90% in 1981. It then declined again to about 30% in 1982. In 1983, there was a sharp increase in the rate of inflation to about 140%.

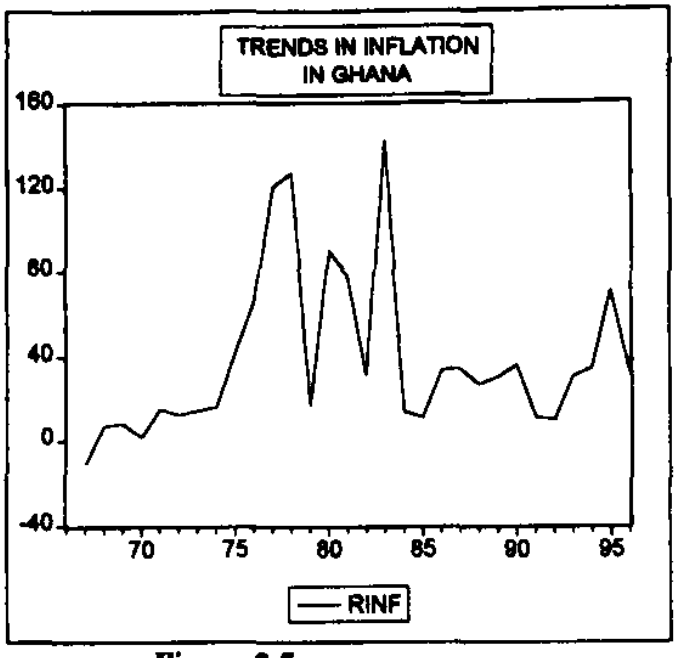

Figure 2.5

The rate of inflation declined to about 19% in 1984, fell further to about 17% in 1985 and rose again to a peak of about 30% in1986. From 1986, it declined to about 33% in 1990 and fell again to about 5% between 1991 and 1992. From 1992, it went up to a peak of about 70% in 1994 and started declining to a low level of about 30% in 1996.

2.19 STATISTICS ON REGISTERED FOREIGN DIRECT INVESTMENT PROJECTS IN GHANA FROM SEPT.,1994 TO SEPT.,1998

The Ghana Investment Promotion Centre is four years old under the GIPC Act 478 of September 1994 which establish it as the agency of the government for the identification and promotion of value-added activities and new potential areas of investments in all sectors of the economy except mining and petroleum.

The "aggressive investment promotion" drive the centre has pursued in the last 4 years continues to show appreciable results. The Centre has registered cumulatively, from September 1994 to September 1998, 735 projects involving

foreign investments primarily in the manufacturing and services sectors with a potential total investment of US$1.2 billion The projects are made up 198 in manufacturing, 191 in service, 82 in tourism, 61 in building and construction, 59 in export trade, 67 in Agriculture, 41 in General trade and 36 in liaison office. In 1997, a total of 237 projects were registered with 68 in manufacturing, 58 in service, 31 in tourism, 17 in building and construction, 15 in export and Agriculture, 17 in General Trade and 16 in liaison office, whilst 187 and 150 were recorded in 1996 and 1995 respectively. Of the 187 projects in 1996 we have 57 in manufacturing, 43 in service, 14 in tourism, 20 in building and construction, 16 in export trade and Agriculture and 10 and 11 projects in General Trade and liaison office respectively. Also for the 150 projects registered in 1995, we have 41 in manufacturing, 49 in service, 12 in tourism, and building and construction,21 in export trade, 13 in agriculture, 2 in general trade and zero project in liaison office. Within the 3rd quarter of 1998, 50 projects estimated at a cost of US$29.22 million were registered to bring the total for the first three quarters of 1998 to 142 projects including 37 and 55 recorded in the first and second quarters respectively. The total projects of 50 were made of 11 in manufacturing, 7 in service and Tourism, 4 in building and construction, 3 in export trade and liaison office, 9 in Agriculture and 6 in General Trade. The total cumulative project of US$1.2 billion is made up of FDI inflow of US$965.80 million (78.34%) and domestic capital outlay of US$266.98 million (21.66%). See appendices A and B for cumulative sector breakdown and investment cost of projects and 1998 quarterly analysis of

projects. The total FDI is made up of US$300.74 million (26.83%) in equity and US$635.06 million (51.51%) as loans, while local contributions in joint-venture projects is made up of US$186.19 million (15.10%) as equity and US$80.79 million (6.65%) as loans. The initial foreign capital transfers made up by investors generated US$108.33 million as against the expected minimum transfer of US$22.60 million required under the Act. (GIPC Act 478). For the 1995 projects, initial capital transfers (actuals) generated US$11.50 as against the expected minimum transfer of US$3.02. Also for the 1996 and 1997, an initial foreign capital transfers made by investors yielded US$11.09 and US$67.83 as against the expected minimum of US$3.91 and US$8.79 respectively. This has also been tabulated in appendix C where we have the financing plan of projects and initial capital transfers.

Of the 735 total projects registered, 506 are joint-venture projects involving US$989.25 million (80.24%) capital outlay while the 229 wholly foreign-owned projects are estimated at US$243.54 million (19.76%). Also the total projects of 19 registered in 1994 has 12 as joint-ventures while 7 projects are wholly foreign-owned projects. In 1995, 150 projects registered were made up of 112 joint-ventures and 38 foreign-owned projects. In 1996, 136 joint-venture projects were registered and 51 foreign-owned. These investments are expected to generate a total employment of 42,833 for an estimated 40,191 (93.83%) Ghanaians and 2,642 (6.17%) non-Ghanaians. This has been depicted in tables a. appendices D and E where we show the ownership structure of projects and investments and expected employment creation by project

respectively. .

Great Britain maintains the lead as the major source of foreign investments into the country with 80 projects registered in the services, manufacturing, building and construction and tourism sectors. Other important sources of investments are US A (56 projects), Germany (53 projects), India (53 projects), China (51projects) Lebanon (38 projects), Italy (31projects), Netherlands (30 projects), Switzerland (30 projects), Korea (25 projects), Canada (17 projects) and France (15 projects). Most of the projects from the others went into manufacturing followed by services, tourism, building and construction, agriculture, liaison office, general trade and export trade. See appendix H for the classification of projects by country and economic activity.

The pattern of regional distribution of projects continue to favour the Greater Accra Region with cumulative record of 569 (77.41%) projects out of 735 recorded so far, with 155 in manufacturing and services, 54 in tourism, 51 in building and construction, 49 in export trade, 39 in Liaison office, 35 in general trade and 31 in agriculture. For the Ashanti region we have 64 (8.71%) projects, made up of 23 in manufacturing, 17 in services, 7 in tourism, 6 in export trade, 4 in building and construction and general trade, 2 in agriculture and 1 in liaison office. In the Western region, we have 37 (5.03%) projects, with 10 in manufacturing and services, 5 in export trade, 4 in tourism and agriculture, 3 in liaison office, 1 in building and construction and zero in general trade. Central region also has 23 (3.13%) projects, with 8 in agriculture and tourism, 4 in manufacturing, 1 in services, export trade and building and construction and zero

in general trade liaison office. Eastern region has 21 (2.86%), with 12 in agriculture, 3 in manufacturing, 2 in tourism, services and export trade and zero in general trade and liaison office. Volta region has 10 (1.36%) projects, with 7 in agriculture, 1 in building and construction, services, and general trade and zero in others. Northern region has 7 (0.95%) projects, distributed as follows: 3 in agriculture, 2 in tourism, 1 in building and construction and services and zero in others. Brong Ahafo region has 3 (0.41%) projects, which are all in the manufacturing sector. Upper East has 1 (0.14%) project, which is in the service sector. There is no project in the Upper West region. The regional distribution of projects by sectors is shown in appendix F.

To correct this regional imbalance, it is suggested that the Social Security and National Insurance Trust (SSNIT) must be encouraged to extend the type of industrial parks being developed in the Greater Accra Region to the other regional capitals to help spread investments. Also the rural electrification project undertaken by the government with the help of Danida is a step in the right direction to attract investment to the remote areas of Ghana.

As at June 1998, the Investment Centre had made visits to 541 (78.88%) project sites and found 388 (71.72%) in operation, 129 (23.84%) preparing to take off. Twenty four (24) (4.44%) projects could not be traced. This has also been shown in appendix G. (G.I.P.C; Statistics on registered projects, Third Quarter,1998)

2.20 COMMENTS ON STATISTICS OF PROJECTS

Registration of businesses as stipulated under the Act continues to increase.

Joint-Venture investments or partnerships between Ghanaian and foreign businessmen in projects are on the increase.

This is viewed as healthy for the sustenance and strengthening of the Ghanaian private sector especially as foreign-investor confidence continues to build up as evidenced by the establishment of two major banks- Metropolitan Allied Bank Ltd and International Commercial Bank Ltd.

The Metropolitan and District Assemblies need to recognize their roles in the district level development under the local government Act by encouraging the establishment of industrial parks/ estates to complement government efforts towards attracting investments to the rural areas in line with Ghana Vision 2020.

There is also the need for strategic structures and regional/ district level incentive packages to encourage investment in the non-attractive regions.

In addition, there is the need for locational tax incentives for regional investments to encourage and promote investments into the northern regions.

In the following chapter, we review both theoretical and empirical literature on Foreign Direct Investment .

CHAPTER 3

LITERATURE REVIEW

3.0 INTRODUCTION

The purpose of this chapter is to review both the theoretical and empirical literature on FDI. The first section of the chapter reviews the theoretical approaches to FDI which are broken down into Neoclassical, Industrial Organization, Eclectic approach, and Portfolio theory. The second part considers the determinants of FDI which are divided into three: demand side, supply side and others. The last section of this chapter covers the review of empirical literature.

3.1 THEORETICAL APPROACHES TO FOREIGN DIRECT INVESTMENT

Overviews of alternative theoretical approaches to FDI are given in Agarwal (1980), Casson (1982), Helleiner (1989), Dunning (1993) and Vos (1994). A distinction can be made into the following main approaches: (i) neoclassical ; (ii) industrial organization (iii) eclectic, and (iv) a branch that studies FDI as part of portfolio choices[8].

3.1.1 Neoclassical Approach

Early neoclassical approaches to international capital movements were based on the premise that capital flows between countries in response to rate of return differentials. This approach is linked to the pure theory of international trade and is associated with the MacDougall model, which is based on perfect competition,

8 Modifications and extensions to elements of the first three of the above-mentioned approaches have been given in a post-keynesian approach (see Harvey, 1989)

absence of risk and other usual simplifying assumptions[9].

MacDougall's contribution essentially focuses on the welfare effects of (direct) foreign investment, rather than on the determinants of FDI. Under unconstrained capital mobility, positive welfare effects for both capital exporting and capital importing countries are associated with a movement of capital between countries. MacDougall analyses the effects for welfare if, in comparison to the basic model, one or more assumptions (e.g. perfect competition, absence of taxation) are relaxed. The main elements on which the model is built are factor endowment, expected profit/rates of return, information asymmetries, taxation and government incentives.

An extension of the neoclassical theory of factor endowments is found in the theory of FDI developed by Kojima[10]. He seeks to explain trade in intermediate products, notably technology management skills. Dunning(1993) notes that, according to Kojima, FDI should serve as a vehicle for trading intermediate products, but the timing and direction of it should be guided by market forces rather than by hierarchical control: outward FDI will be undertaken by those firms that produce intermediate products requiring resources and capabilities in which the home country has a comparative advantage, in order to produce those in host countries in which the investing country has a comparative disadvantage; inward FDI will take place if the reverse conditions regarding comparative advantage apply[11]. As Kojima (1982) contends: "Foreign direct investment should originate in the investing country's comparatively disadvantaged (or marginal) industry (or activity), which is potentially a comparatively advantaged industry in the host country." The neoclassical

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9 MacDougall (1960); see Vos (1994, ch.3) for an exposition of the MacDougall model.

10 For a discussion of this theory, see Dunning (1993, pp. 89-90)

11 See Dunning (1993)

assumptions of absence of market failure and given (human) resource endowments make that the theory cannot explain trade in intermediate products based on product differentiation and the need for exploiting economies of scale. Neither can it explain other manifestations of market failure.

Also largely neoclassical approach is the flexible-accelerator type private investment theory (e.g. Lucas, 1993). The theoretical approach of Lucas is set out by outlining a simple model of capital requirements of a profit-maximizing, multiple product monopolist. Given some degree of monopoly in its product markets, the multinational firm is assumed to determine the profit-maximizing level of production and, hence, the capital requirement, in each host country. The basic model is extended by incorporating elements of risk, expectations and interdependence of locations.

3.1.2 Industrial Organization Approach

An alternative approach in the tradition of the industrial organization theory assumes that foreign enterprises have oligopolistic power in host country markets[12]. Key elements in this approach are market imperfections and barriers to entry. There are unique firm-specific attributes, such as product technology, management skills and economies of scale, as a result of which foreign firms have advantages over local firms. These advantages more than off-set the disadvantages they have compared with local firms[13]. The location of production is explained by comparative advantage and factors such as transport costs and other "frictions". As Helleiner notes, this approach does not resolve the question of why foreign firms do not sell their advantages to local firms, instead of opting for undertaking operations abroad.

12 See Hymer (1976), Kindleberger (1984), Buckley and Casson (1976).
13 See also Agarwal (1980)

3.1.3 Eclectic Approach

In the "eclectic" approach (or paradigm) of international production of Dunning, elements of the theory of the firm and of the theory of international trade have been incorporated[14] . According to Dunning, there is no general theory of FDI and it does not make sense to look for a single all-embracing theory of FDI, no more than there is a general theory that can explain all kinds of international trade. The eclectic paradigm accepts the traditional Herscher-Ohlin-Samuelson (H-O-S) trade theory, to the extent that it can explain the spatial distribution of some types of output (natural resources and unskilled labour intensive commodities), that better explain trade in manufactured and skilled labour-intensive commodities. Much of trade between developed and developing countries falls in this category. There are various factors that may be relevant to explain the phenomenon of FDI, but it depends on circumstances.

The eclectic approach may be called a blend of the (neoclassical) approach associated with trade theory and the industrial organization approach. It uses the idea of internationalization advantages developed by Buckley and Casson (1976), among others, but which can be traced back to Hymer's thesis, that was written in 1960 and published in 1976[15] . For the exporting country it is sufficient to have only a location-specific advantage to explain the location of production of certain types of output (such as natural resources and unskilled labour intensive commodities). But to explain the ownership of that output that is produced (i.e., whether or not it is produced by a multinational) and the spatial distribution of other types of output, the eclectic

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14 See also Dunning (1982, 1993). Note that this approach refers to international production, that is, it refers not only to foreign direct investment but also to exports.

15 See Hymer (1976)

paradigm resorts to the modality of economic organization, rather than to the distribution of factor endowments. Given firm-specific and locational advantages, foreign firms internalize activities in other countries in their operations, in order to benefit from advantages such as scale economies and transfer pricing and to overcome market imperfections related to informational deficiencies and so on.

The eclectic paradigm thus identifies three advantages: ownership-specific (O), internalization (I) and location-specific (L) advantages. The eclectic, or OLI, paradigm can best be summarized in Dunning's own words: "At a given moment of time, the more a country's enterprises - relative to those of another - possess O advantages, the greater the incentive they have to internalize rather than to externalize their use, the more they are likely to engage in outbound production. By the same token, a country is likely to attract foreign MNEs when the reverse conditions apply"[16].

3.1.4 Portfolio Theory Approach

A fourth branch studies FDI as part of portfolio choices of domestic and international investors (cf. Brainard & Tobin 1992), in which FDI form part of portfolio decisions between (more or less) substitutable assets. Portfolio theory takes into account the element of uncertainty, that was missing in the classical model of capital flows. Investors are postulated to consider not only rates of return, but also risk in selecting their portfolio. The portfolio theory is based on the observation that fluctuations in rates of return on capital within, and even more so between, countries are not perfectly correlated, so risks might be reduced by a diversification of portfolios[17].

Brainard and Tobin have proposed a multi-asset stock adjustment model. The

16 Dunning (1993, p.80)
17 See, for example, Agarwal (1980)

portfolio literature contends that the desired end-of-period stocks of assets are to be specified as a function of rates of return and asset prices, among other variables. In general, the demand for stocks at the end of a period will differ from the value of the previous-period quantity of the asset valued at current period asset prices. The flow demands for the period are considered to be a fraction of the discrepancy between the two, plus a growth factor. For FDI, this represents the increments in capital stocks evaluated at current replacement cost. An overview of the main elements in the theoretical approaches to FDI is given in Table 3.1 below

TABLE 3.1: ALTERNATIVE THEORETICAL APPROACHES TO FDI

THEORETICAL APPROACHES	NEOCLASSICAL			INDUSTRIAL ORGANIZATION		ECLECTIC	PORTFOLIO THEORY
	a	b	c				
	MacDougall model	Kojima's theory of FDI	Lucas model of FDI				
AUTHORS	MacDougall	Kojima Ozawa	Lucas	Hymer Kindleberger Buckley Casson		Dunning	Lizen Markowitz Bramard Grubel Rugman
DETERMINANTS/ELEMENTS							
1 Profit maximization							
factor endowments	x	x	x			x	x
expected profit rates of return	x	x	x			x	x
risks			(x)	x		x	x
host country wage rates			x	x		x	
2 Firm-strategic & market-imperfection							
information asymmetries	(x)			x		x	x
oligopoly power; product differentiation			x	x		x	
transaction costs						x	
expected sales in host country						x	
3 Policy variables							
taxation	(x)		x	x		x	
capital controls			(x)				
trade barriers	(x)					x	
government incentives	(x)					x	
exchange rates			(x)			x	

Notes: 1 This classification has to some extent been made on the basis of reviews of the literature by Agarwal (1980), Casson (1982), Helleiner (1989) and Dunning (1983). 2 (x) means included in extensions to or variations on the basic model.

The first two, highly theoretical, approaches mainly confine themselves to incorporating the elements of the theory of international trade. The approach of Lucas is different, because it is based on the accelerator model and assumes multiple product

monopolists. He is not in the first place concerned with comparative advantages as in, basically, the two-commodity framework of the previous two approaches. The starting point is even more different in the industrial organization approach. This approach focuses on the multinational firm, considers market imperfections, barriers to entry and transaction costs, and contends that multinational enterprises use their oligopolistic power to offset disadvantages relative to local entrepreneurs by firm-specific advantages. As can be seen in Table 3.1, the elements constituting this approach are largely different from those of the first two approaches[18]. While Dunning's approach is undoubtedly closer to that of the industrial organization approach, he also incorporates the traditional trade theory. The eclectic paradigm may be more explicit on (possible) factors determining FDI which can be empirically tested, but still calls for much further analysis. The portfolio theory, finally, is largely associated with elements of profit maximizing.

In this work some elements of neoclassical and eclectic approaches will be used to develop a simultaneous equation model.

3.2 DETERMINANTS OF FOREIGN DIRECT INVESTMENT

Foreign direct investment is distinguished from portfolio investment. The former entails control of a local enterprise by foreign residents, while the later does not [Giorgio, R. 1973]. Moreover, FDI is essentially made by corporations while portfolio investments are largely made by individuals. The most crucial distinction is that portfolio investments are purely financial movements of capital whereas FDI involves international movements of technology, managerial and organizational skills

18 Kojima (1982) explicitly opposes his approach to what he labels the International Business Approach.

together with capital [Soderstein, 1992][19].

The theory of foreign direct investment maintains that FDI flows to countries with higher returns on investment. Several scholars have shown that other factors are equally important It has also been documented that the inter-play of social, political and economic factors is relatively more important in determining the direction of international capital flows. Generally, FDI is said to be affected by demand factors, supply factors, and other factors. We review these determinants in turn.

3.2.1 DEMAND [PULL] SIDE

Here we review the demand side determinants of FDI. These include the size of the domestic market, privatization programs, debt-equity swaps, production and marketing cost advantages [20].

The market size hypothesis, usually proxied by GDP or GDP per capita, has been noted in most studies as a major determinant of FDI [Scaperland, 1969; Gary et al, 1994; Wang et al, 1995; Moore, 1993 and Ekpo, 1996]. The reasoning behind this is that foreign firms invest abroad to capture markets especially in the event of declining markets at home. However, the market size hypothesis may not be true for developing countries where the output produced with the help of foreign capital is exported rather than sold in the domestic market [Spitaller, 1971].

In this case FDI is most likely to be drawn by the opportunity to exploit the host country's natural resources. If FDI is attracted to the natural resource rather than the size of the market, then FDI is said to be supply rather than demand driven.

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19 "Foreign direct investment can no longer be viewed as the acquisition of foreign productive capital in the global market. It is rather increasingly the transfer of capital to set up a foreign operating unit which then achieves the 'real transfer' by importing the capital equipment, intermediate and semi-finished goods , in order to encourage foreign labour and primary materials in the production of final goods for domestic sale and export" (Kregel,1994 p29)

20 Industrial capabilities, human resource development , research and technological infrastructure and similar supportive services are additional demand factors that attract FDI.

Another demand side factor is production cost advantage. Foreign firms tend to locate production activities where production costs are lower. The neoclassical theory suggests that low labour costs play an important positive role in decisions to invest overseas. Furthermore, since "white collar and supervisory labour cost have been rising in most developed countries", foreign investment, especially from technologically advanced countries, is likely to be attracted by countries with high skilled labour coupled with relatively lower wages. (Meier, 1995, p. 6, Hoogang et. al, 1974).

FDI to Mauritius and East Asian countries has been mostly attracted by the availability of relatively cheap skilled manpower. Related to the goal of reducing production costs are marketing cost considerations. A foreign firm may decide to set up production facilities in the country it exports to in order to circumvent tariff barriers so as to reduce marketing costs. This factor assumes importance when the marketing cost saving outweighs the production cost advantage. "A growing host country market might encourage local investment, especially if export costs are high" [Moore, 1993, p. 125].

Privatization programs and debt equity-swaps may provide channels for consolidating foreign private capital in African countries. The reason is that privatization provides the link between the potential at country and industry levels and investment opportunities at firm level. However, when assessing the impact of Privatization and debt-equity swaps on FDI, it should be noted that their effects on FDI are constrained to a large extent by the number of companies which are publicly owned and the pool of private debt to be converted. Drawing on the experience of Latin America, Eastern and Central Europe, foreign investors' participation in privatization programs still stands as an essential vehicle for fast inflows of FDI to

developing countries (UNECA, 1995, p.9)

3.2.2 SUPPLY (PUSH) SIDE

In this study, factors that influence the supply of funds for foreign direct investment are regarded as the supply side determinants of FDI. The amount of funds available for foreign investment is related to economic activity in the country investing abroad. Economic growth in the major capital exporting countries is likely to improve corporate liquidity of foreign firms. (Caves, 1989) Sound corporate liquidity in turn increases the amount of assets of a foreign company for export, licensing, and foreign investment. The relationship between economic prosperity in the sourcing countries and FDI depends on whether investment abroad substitutes or complement investment in the sourcing country[21] The supply of funds for investment abroad also depends on the opportunity cost of investible funds. In this case, the level of international interest rates will affect the flow of direct investment as the discounted returns on alternative investment opportunities change

Differences in resource endowment which partly determine the industrial and structural differences between countries are yet another supply side factor likely to influence the flow of FDI (Krainer, 1967) For instance capital inflows to most African countries are significantly attracted to natural resources. For example, the share of the primary sector in total FDI inflows in Zambia was about 46% during the 1980-1983 period. In Botswana about 88% of FDI was attracted to natural resources in 1989 (UNCXTAD/UNECA 1995, p.34) Natural resource endowment has been confirmed as an important determinant of FDI in most countries (see Kojima, 1973, Zhang et al,

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21 Kramer (1967) studied British investment abroad, which is predominantly based on exploitation of raw materials. He noted that British foreign investment tends to rise or fall with British GDP. hence, a positive relationship can be said to exist between British investment and its level of natural resource based FDI abroad. Contrary to this, Kramer in the same study found USA investment abroad, which is mainly in manufacturing, to fall when the USA economy grows

1996; and UNCTAD, 1992 and 1995)

3.2.3 OTHER FACTORS

The other determinants of FDI include the policy variables that are likely to change the business environment. These include monetary and fiscal policies, political and economic stability, investment regulatory frame-work, taxation, subsidies and foreign debt. These factors may influence the inflow of FDI through their impact on investment risk and uncertainty. Some of the factors are considered below.

According to the accelerator principle of investment, fixed business investment responds to changes in the desired level of the capital stock which depends on the demand for output and the cost of capital. The traditional literature maintains that a lower cost of capital is necessary to increase investment. Parallel to the traditional literature, the modern literature on private investment emphasizes the role of uncertainty (Serven and Solimano, 1992; George et al, 1993; Jarspersen et al, 1995). The response of private investment to various measures of uncertainty is likely to be negative since uncertainty increases the cost of capital as a result of higher premium (referred to as the price of waiting). Uncertainty is affected by the volatility in the price of output and the price of capital. Hence, policies that reduce uncertainty are likely to induce more foreign investment.

The analysis of the impact of economic and political risk on FDI emphasizes inflation risk, exchange rate risk, country risk, output instability (economic growth rate) and transparency of government policies and its institutions. High and variable inflation rate shortens both the investment planning horizon of firms and the maturity period of private sector credit. Furthermore, high rates of inflation reduce the real rate of return on investment and may destroy a firm's competitiveness through its effect on the cost of inputs and the price of the firm's output. Real depreciation of the local

currency affects investment through its effect on the real cost of capital and real output. Unanticipated devaluation affects the profitability of local firms by raising the price level and increasing the cost of imported intermediate inputs. Exchange rate volatility leads to high exchange risk, uncertainty and macroeconomic instability. The debt crisis has depressed the expected returns on investment in most developing countries. Africa's debt problems have been amplified by balance of payment difficulties. The foreign exchange shortages have made it difficult for these countries to guarantee that FDI income can be transferred abroad. This further increases uncertainty and country risk, making the investment climate unconducive to foreign investment (Servan and Solimano 1984; Jaspersen, et. al. 1995). Country risk combines macroeconomic and political factors upon which the international markets base their credit assessment of a country. Low credit rating entails reduced access of a country to long term credit in international financial markets. This also influences foreign investor's decision to invest in a particular country. Therefore, foreign investment is likely to be low in countries where credit rating is low (Jarspensen et al, 1995).

Government policies affect FDI through several channels. Since foreign firms may decide to finance some of their investment and joint ventures from domestic financial sources (Wang et al. 1995), restrictive monetary and credit policies are likely to inhibit the inflow of foreign investment. This would be the case when such policies induce a rise in the real cost of bank credit or reduce the stock of domestic credit. Similarly, financial repression, induced either by controlling interest rates or by government intervention in the allocation of credit, is likely to result in bank credit shortages and hence credit rationing. Thus, repressive financial policies are expected to adversely affect both domestic and foreign investment (Blejer and Khan 1984,

Solimano 1989, Serven and Solimano 1992).

The effect of fiscal policy on investment can be analyzed by looking at how fiscal deficits are financed, the composition of public investment, and the level of government external debt. High government fiscal deficits, financed through domestic borrowing, affect the amount of credit available to the private sector in two ways: first, government domestic borrowing raises the interest rates and hence the cost of borrowing; and second, it reduces the amount of credit available to the private sector. These two effects often lead to the crowding out of the private sector. As this occurs, joint ventures with foreign firms that largely depend on domestic borrowing will fall. Fiscal deficits may also signal high future taxation, thereby reducing the expected future rates of return on foreign investment. Restrictive fiscal policy that leads to cuts in public sector investment in infrastructure which is an important determinant of foreign investment would adversely affect FDI flows (Blejer and Khan, 1984).

3.3 REVIEW OF EMPIRICAL LITERATURE

It is important to note at the outset that the determinants of FDI are country specific, although some determinants may be the same across regions. The factors that have been found to influence FDI include the size of the domestic market, output, income per-capita, exchange rate, fiscal deficit, debt service, inflation (macroeconomic stability), creditability, and institutional and political factors (see Serven and Solimano, 1992).

In this sub-section, we provide a review of some empirical studies of the determinants of FDI which has been grouped into developed and developing country studies.

(i) DEVELOPED COUNTRY STUDIES:

Wang and Swain [1995] conducted a study on China and Hungary to isolate the determinants of FDI in the two countries. They used the ordinary least square technique on a non-logarithmic one-equation model. Time series data from 19[illegible] to 1992 was used. The explanatory variables included market GDP, absolute changes in GDP, GDP growth rate, the ratio of domestic wage to the USA wage rate, opportunity cost of capital measured by the long term US bond rate, domestic interest rates, imports, growth rate in OECD countries and a dummy variable to capture changes in the political regimes. Evidence from this study shows that market size proxied by GDP per capita and absolute changes in GDP of the host country, the wage rate, domestic interest rate, and the opportunity cost of capital exert a considerable influence on FDI in China and Hungary. The discounted cost of capital variable of the host country was significant only for Hungary [Wang et al. 1995]. The implication is that foreign investors outperform their working capital by borrowing from the host country's financial markets. In this case domestic financial borrowing may attract direct investment in Hungary. Likewise, the opportunity cost of capital proxied by the US bond rate was significant for China. In the case of Hungary, the growth rates in OECD Countries was found to be an important determinant of FDI. The labour cost variable was only significant in China. The negative correlation between labour cost and FDI in China concurs with the findings of Woodward and Rolfe (1993) on the Caribbean Basin Countries and Moore (1993) on Ireland who also found a negative relationship between the cost of labour and FDI. In contrast to these findings, Swedenborg (1979) found a positive relationship between the wage rate and FDI in Sweden. He justified this result on the grounds that " a higher wage rate may reflect skill intensity, which acts as a locational advantage and would be positively

related to FDI flow"

(Swedenborg, 1979, p. 295).

Wang and Swain [1995] and Drake and Caves [1992] found that the growth of imports in the host country is a major determinant of FDI in China, and Japanese foreign investment in the United States respectively. Zang et al [1996] used statistical analysis to study the relationship between trade and FDI in China [host country] and the Development of the Association of South and East Asian Nation [ASEAN] [investing region]. Data between 1979 and 1992 was used. The study shows that FDI in China during 1979 - 1992 was generally responsive to the growth in trade interdependence between ASEAN and China. Hence, the level of trade interdependence between the host and the investing countries need to be considered as a determinant of FDI. Furthermore, it is often urged that outward investment is likely to occur in industries in which the home country has been losing or lacks comparative advantage relative to the host country. [Zang, et. al, 1996; Kojima, 1973]. The results of the study on ASEAN foreign investment in China supports this hypothesis. Comparative advantage in resource endowment and trade interdependence are major determinants of FDI in China [Zang et al, 1996]. The degree of openness of the host country to trade improves the inflow of FDI into the host country [Spillater et al 1995].

However, trade restrictions might also cause FDI to increase. High trade restrictions reduce foreign sellers net revenue from exports. This, in turn, may induce exporters to establish production activities within the domestic market. Kogut and Chang [1991] and Drake and Caves [1992] found a significant positive effect of quantitative restrictions on some Japanese foreign investment. Wang and Swan [1995] on the contrary failed to establish this positive relationship between the tariff

variable and FDI in China. In this regard the effect of restrictive trade regimes cannot be ascertained a priori.

The role of financial factors in enhancing the inflow of FDI should not be underestimated. Perhaps most important is the role of corporate liquidity, captured by the host country's GDP growth. Caves [1989] noted that a country's foreign investment in the USA is substantially influenced by corporate liquidity[22] [profitability] of already established firms.

Gray Hufbauer, Darins Lakdawalla and Anup Malani [1994] conducted a study on the United States, Sweden, Germany and Japan using annual panel data for 1980, 1985 and 1990 to test the determinants of FDI and the link between FDI and trade. They estimated a logarithmic one-equation model, with the logarithm of the stock of FDI as the dependent variable. The explanatory variable included host country's per capita GDP and population growth rate to test for the domestic market hypothesis, the openness of the host country to trade, the distance between the hub and the partner, several regional dummies, and a time trend. The result shows that the openness and the size of the domestic economy are important determinants of the distribution of investment stocks [Gary, et al. 1994, p. 50]. Further, it was shown that investment by Japanese firms tend to follow established locations. Coughlin et al [1991] equally noted in their study on USA that countries with higher per capita incomes and higher density of manufacturing activities attract relatively more foreign firms. To establish the link between trade and FDI stock, the same regression technique was used with

22 A standard problem in testing the influence of corporate liquidity on investment is that increases in liquidity are likely to be correlated with an observable disturbances that increase the profitability of the firm's current activities and investment.

home country import or export as a dependent variable The results illustrate different effects of FDI on trade In Sweden and Japan for instance, FDI tended to promote more imports than exports, and the reverse in United States

Wang [1995] used time series data from 1978 to 1992, to test the trade effects of FDI in China and Hungary He expressed the export equation as a function of the host country's terms of trade, world demand, and the host country s GDP and lagged exports The host country's demand for imports was specified as a function of the host country's capacity to import and previous level of imports He then introduced FDI in the export and import functions of two countries He found out that FDI generates positive and negative net trade effects in China and Hungary respectively

Table 3.2 CASE STUDIES SUMMARY

Statistically significant FDI Determinants and Coefficient sign				
Study/country/Econometric Technique	sector	Market size	Factor Cost	Others
Bajorubia and Sosvilla-Rivero(1994), Spain (1961-89) ,Cointegration,	Manufacturing Non-Manufacturing	GDP +	Wages- (only in non-manufacturing	Instability- Trade barriers-
O'Sullivan (1993)' Ireland (1960-1980) 2SLS	Manufacturing	Foreign GDP +	Wages- Exchange Rate-	Government Grants-
Wang and Swain (1995), China (1978-92), OLS	Manufacturing	GDP + GDP Growth +	Wages + Interest Rate- Exchange Rate+	Trade barriers-
Wang and Swain (1995) Hungary (1968-92) OLS	Manufacturing	GDP + GDP Growth (OECD) +	Wages + Interest Rate- Exchange Rate-	
Milner and Pentecost (1996), UK (1989,1990) Tobit	Manufacturing	Sales +		Competitiveness + Comparative Advantage +
Lee and Mansfield (1996), US (1991), OLS	Manufacturing	GDP +		Degree of Industrialization + Openness + Weakness of Property Law -
Braunerhjehu and Svensson (1996) Sweden (1978,1986,1990), Tobit , OLS	Manufacturing	GDP + Population engaged in R&D +		Distance to host country - Agglomeration +
Gray Hufbauer, Danins Lakdawalla and Anup Malani (1994) US(1980,1985,1990) Sweden(1980,1985,1990) Germany(1980,1985,1990) Panel Data	Manufacturing Non-manufacturing	GDP + Population Growth Rate +		Openness + Distance-
Ekpo (1996) Nigeria (1974-1994) OLS	Manufacturing Non-manufacturing	Per Capita GDP +	World Interest Rate -	Inflation_ Foreign Debt-
Mulenga (1997) Zambia (1970-1995) Cointegration,	Manufacturing Non-manufacturing	GDP +	Lack of Credit-	Natural Resource + Foreign debt - Risk & Uncertainty -

A brief summary of the Case Studies surveyed in the literature is provided in Table 3.2 above.

Bajorubio and Sosvilla-Rivero [1994] examine the composition of FDI between manufacturing and non-manufacturing activities in Spain, and argued that FDI fosters integration into world markets, and promotes faster output growth as a result. Inflation is used as an ancillary variable to measure overall economic stability, which is expected to increase the user cost of capital in the recipient economy and

affect the profitability of FDI negatively, so acting as a FDI deterrent. In the same vein, exchange rates are expected to affect FDI in so far as they affect a firm's cash flow, expected profitability and the attractiveness of domestic assets to foreign investors. A positive impact is expected when the domestic currency is relatively weak compared to that of the foreign investor, as in the case of China. In this study, cointegration approach was used to estimate a single equation for FDI. The study found that GDP, wages (only in non-manufacturing), Instability and trade barriers were statistically significant FDI determinants [Wang and Swain, 1995].

The hypothesis that MNC investment leads to the creation of a dual economy is tested for the case of Ireland, by O'sullivan [1993]. Foreign firms are shown to have higher capital intensity, and tend to engage in assembly-type activities with a higher export-to-sales ratio, and a higher imported input content than domestic firms. This study used a two-stage least square to estimate the FDI equation. The significant FDI determinants are GDP, wages, exchange rate, and government grants.

The hypothesis that comparative advantage and competitiveness affect FDI is tested by Milner and Pentecost [1996] in the case of US investment in UK manufacturing. The former is defined as the ratio of exports to sales or the net trade ratio, whereas the latter is measured by the sales concentration ratio. Both variables are found to have a positive impact on FDI. When the hypothesis that local country- or industry-specific factors affect the geographical location of foreign production is tested, Braunerhjelm and Svensson [1996] show that FDI in Sweden is highly responsive to concentration or agglomeration patterns [measured as the employment share of foreign firms]. This is because firms tend to locate manufacturing affiliates in geographically defined areas specializing in similar production, such that overseas operations are positively affected by host countries having large production in the

same industry. The impact of agglomeration is shown to be stronger, the more technologically advanced the industry/sector hosting the foreign investment. With regard to the impact of institutional characteristics of the host country on inward FDI, Lee and Mansfield [1996] examine the hypothesis that intellectual property protection influences the volume and composition of FDI, in the case of outward FDI from the US. The negative sign of the coefficient is robust to the inclusion of other explanatory variables, including the degree of openness of the recipient economy [also Wheeler and Mody, 1992].

(ii) DEVELOPING COUNTRY STUDIES:

Ekpo (1996) analyzed the macroeconomic determinants of FDI in Nigeria. The study applied the ordinary least square technique on time series data from 1974-1994. The ratio of foreign direct investment to GDP was used as the dependent variable, the explanatory variables included a dummy for changes in political regimes, real income per-capita, the rate of inflation, world interest rate, credit-rating and foreign debt service. The studies found that political regimes, real income per-capita, the rate of inflation, world interest rate, credit-rating, and foreign debt service are important and significant determinants of FDI in Nigeria.

Mulenga (1997) examined the factors that influence FDI flows in Zambia and analyzed the effects of the FDI on Zambia's trade balance using one-equation econometric models of FDI, exports and imports. The empirical model recorded a good fit suggesting that the explanatory variables isolated are the most important macroeconomic determinants of FDI in Zambia. Similarly, the estimated models of exports and imports suggest that FDI increases exports whereas it reduces imports thereby producing an increase in the trade account balance. The study found that natural resource endowment, foreign debt, lack of credit, the size of domestic market

and risk and uncertainty are the most important and significant macroeconomic determinants of FDI in Zambia.

All of the studies reviewed in the literature for both the developed and the developing countries so far are single-equation studies which tend to limit the number of variables considered. Developing an appropriate simultaneous equation model of FDI for Ghana would therefore enable more explanatory variables to be considered and reduce the problem of simultaneous and omitted variable bias. This will also serve as an additional contribution to the literature on the determinants of FDI.

This thesis will therefore attempt to develop a simultaneous equation model to show the inter-links among FDI, exchange rate, inflation, output growth and natural resources in Ghana using the VEC and the VAR approach.

CHAPTER FOUR

MODEL SPECIFICATION AND METHODOLOGY

4.0 INTRODUCTION

The first section of this chapter covers the specification of the model used for this work and the methodology. The next section looks at the stationarity of the variables used for the work, test for cointegration, the Error Correction models and the long run equations. The next subsequent sections consider the Granger Non-Causality test, Forecast Error Variance Decomposition, and the impulse response functions.

4.1 MODEL SPECIFICATION

The choice of endogenous and exogenous variables was based on Pain's (1992) theoretical formulation of the long run model of FDI and the survey of both the theoretical and empirical literature. The factors that have been found to influence FDI include the size of the domestic market, output, income per-capita, exchange rate, fiscal deficit, debt service, inflation (macroeconomic stability), credibility, and institutional and political factors. (Serven and Solimano, 1992).

Below we provide a brief discussion of the variables specified in the FDI model for Ghana.

The market size hypothesis usually proxied by GDP or GDP per capita, has been noted in most studies as a major determinant of FDI. (Moore, 1993, Ekpo 1996). The reasoning behind this is that foreign firms invest abroad to capture markets especially in the event of declining markets at home. Given the significant improvement in GDP as a result of Economic Recovery Programme in Ghana, the study deemed it fit to include GDP as a proxy for market size in the FDI equation. The GDP is expected to be

positively related with FDI. Hence, the larger the size of the domestic market the larger the inflow of FDI.

The effect of fiscal policy on investment can be analyzed by looking at how fiscal deficits are financed, the composition of Public investment, and the level of government external debt. High government fiscal deficit, financed through domestic borrowing, affect the amount of credit available to the private sector in two ways: first, government domestic borrowing raises the real interest rates and hence the cost of borrowing, and second, it reduces the amount of credit available to the private sector. These two effects often lead to the crowding out of the private sector. As this occurs, joint ventures with foreign firms that largely depend on domestic borrowing will fall Fiscal deficits may also signal high future taxation, thereby reducing the expected future rates of return on foreign investment and therefore the amount of repatriated profit. Also restrictive fiscal policy that leads to cuts in public sector investment in infrastructure which is an important determinant of foreign investment would adversely affect FDI flows (Blejer and Khan, 1984) Therefore, high government deficit is expected to negatively a.fect the inflow of FDI in Ghana.

Foreign debt and its associated resource transfer to creditors is an important source of instability and uncertainty (Serven and Solimano, 1992). Large foreign and domestic debt stocks are likely to adversely affect the inflow of FDI. This is because debt overhang signals the possibility of a fiscal crisis and future economic policy reversals. Whether the debt service is financed by increased taxes or printing money (inflationary) the ultimate impact is to reduce investment returns. In this case, external debt is expected to take a negative sign.

The Cost of Capital: The domestic rate of interest will be used to measure the cost of domestic capital (i.e., the cost of bank credit). High domestic cost of bank credit is expected to adversely affect the inflow of FDI. The weighted rate of interest of the major investors in Ghana - Britain, Germany and USA - is used as a proxy for the opportunity cost of Capital (FDI). The motivation is that if the rates of return on investment is higher in the home country than the host country, then, it is prudent for a foreign firm to invest at home rather than undertake foreign investment. In this case, the interest differential (the difference between the foreign rate of interest and the domestic rate of interest) is expected to have a positive impact on FDI in our model.

Devaluation: changes in the nominal exchange rate (ECX) captures the effect of devaluation of the host country's currency relative to that of the sourcing country. Exchange rates are expected to affect FDI in so far as they affect a firm's cash flow, expected profitability and the attractiveness of domestic assets to foreign investors. Real depreciation of the local currency affects investment through its effect on the real cost of capital and real output. Unanticipated devaluation affects the profitability of local firms by raising the price level and increasing the cost of imported intermediate inputs. Exchange rate volatility leads to high exchange risk, uncertainty and macroeconomic instability. A negative relationship between exchange rate and FDI is therefore anticipated. (Wang and Swain, 1995)

Natural Resource Potential: Location of production facilities near the source of raw materials and other inputs reduces transportation cost and, hence, the cost of marketing. If this cost advantage outweighs other considerations, then, it becomes prudent to locate production enterprises near the source of raw materials. In the same

vein, multinational corporations (MNCs) do engage in horizontal and vertical integration to enhance and capture both the input and output markets. From these two expositions, a country with a high natural resource potential is likely to attract foreign investment. Weighted index of Ghana's primary commodity exports - Cocoa, Gold and Diamond - will be used as a measure of natural resource potential (NR). A positive correlation between Ghana's natural resource potential and FDI is anticipated.

Macroeconomic Instability measured by high inflation rate (INF) worsen the investment environment and scare foreign investment away. Given that investors are risk averse, risk and uncertainty in the investment environment would adversely affect foreign investment. A negative coefficient between the inflation rate and FDI is anticipated.

Political instability: A dummy variable will be used to represent political instability (D) in Ghana. In this case D= 1 for the period when there was military regime in Ghana and D=0 when there was a civilian rule.

Economic Recovery Programme: A dummy variable will also be used to capture the effect of the ERP on Foreign Investment flow in Ghana. Here too, D=0 for the period when there was no ERP and D=1 for the period after the ERP.

From the above discussion a dynamic FDI model for Ghana is developed, assuming that monetary factors do not affect the endogenous variables which are Foreign Direct Investment (FDI), Exchange rate (EXC), Real output (GDP), Inflation (INF), and Natural resources (NR). Therefore, we have price equation, exchange rate equation, output equation and two constraints indicated by Foreign Direct Investment and Natural resources. Besides the endogenous variables, we have the domestic interest rate (INT), foreign interest rate (FINT), fiscal deficit (FIDEF), foreign debt (FBDT), dummy for

political instability (PIDD) and Economic Recovery Programme (ERPPDD) as exogenous variables.

The following assumptions are also made in building the simultaneous equation model of FDI in Ghana.

1. An endogenously determined domestic price level (INF). We are assuming that Ghana is monopolistically competitive in tradables (Cocoa) or the domestic price level represents the prices of non-tradables.

2.The foreign price level and the foreign rate of interest are exogenously determined by the rest of the world.

3. The nominal exchange rate is also endogenously determined from within the system and is indicated by (EXC). We define the exchange rate as the amount of domestic currency one has to give up in order to obtain one unit of foreign currency.

4. In addition to trade in goods and services, we also have capital inflows and outflows.

5. We assume international monetary transfers both by individuals and government.

6. FDI affects the level of activity and is therefore endogenously determined.

7. The exploitation of natural resources is crucial for economic development and we assume that it is endogenously determined.

In the foreign exchange market the terms of trade or the real exchange rate is defined as the nominal exchange rate multiplied by the foreign price level and divided by the domestic price level.

Hence, the domestic terms of trade is affected by changes in the nominal exchange rate and the domestic price level under a flexible exchange rate system.

The exchange rate is further influenced by the foreign direct investment (capital inflow),

the level of output (imports depend on GDP) and natural resources (exports depend on the exploitation of natural resources). Thus, we can express the exchange rate (EXC) as a function of output (GDP), domestic price (INF), foreign direct investment (FDI) and natural resources (NR).

Our equation for the exchange rate market in logarithm of the variables is therefore specified as:

$$LEXC = F(LGDP, LINF, LFDI, LNR)$$

In order to make the model dynamic, we introduce lags in the endogenous variables so that:

$$LEXC = F(LEXC_{t-1}, \quad LEXC_{t-4}, LGDP_t, LGDP_{t-1}, \quad LGDP_{t-4}, LINF_t, LINF_{t-1}, LINF_{t-4},$$

$$LFDI_t, LFDI_{t-1}, \quad LFDI_{t-4}, LNR_t, \quad LNR_{t-1}, \quad LNR_{t-4}) \qquad (1)$$

That is variations in the exchange rate are explained by its own lags and that of real output, price level, foreign direct investment and natural resources.

The aggregate demand curve that comes from the product market is specified in logarithmic values of the variables as:

$$LINF = F(LGDP, LEXC, LFDI, LNR)$$

To make the model dynamic, we again introduce lags in the endogenous variables so that:

$$LINF = F(LINF_{t-1}, LINF_{t-4}, LGDP_t, LGDP_{t-1}, \quad LGDP_{t-4}, LEXC_t, LEXC_{t-1}, \quad LEXC_{t-4},$$

$$LFDI_t, LFDI_{t-1}, \quad LFDI_{t-4}, LNR_t, LNR_{t-1}, \quad LNR_{t-4}) \qquad (2)$$

The investment constraint is also introduced in this model and it is specified in logarithmic values of the variables as:

$$LFDI = F(LGDP, LEXC, LNR, LINF)$$

In dynamic form, this constraint becomes:

$LFDI = F(LFDI_{t-1},\ldots LFDI_{t-k}, LGDP_t, LGDP_{t-1}, LGDP_{t-k}, LEXC_t, LEXC_{t-1},\ldots LEXC_{t-k},$

$LINF_t, LINF_{t-1},\ldots LINF_{t-k}, LNR_t, LNR_{t-1},\ldots LNR_{t-k})$.....(3)

We also have the aggregate supply curve that comes from the labour market and is specified in logarithmic values of the variables as :

$LGDP = F(LINF, LEXC, LFDI, LNR)$

By introducing lags into the model, this equation can be re-specified as:

$LGDP = F(LGDP_{t-1},\ldots LGDP_{t-k}, LINF_t, LINF_{t-1},\ldots LINF_{t-k}, LEXC_t, LEXC_{t-1}, \ldots LEXC_{t-k},$

$LFDI_t, LFDI_{t-1}\ldots LFDI_{t-k}, LNR_t, LNR_{t-1},\ldots LNR_{t-k})$.....(4)

Finally, we also have the natural resource constraint which is specified in logarithmic values of the variables as:

$LNR = F(LGDP, LINF, LEXC, LFDI)$

In dynamic form, this equation becomes:

$LNR = F(LNR_{t-1},\ldots LNR_{t-k}, LGDP_t, LGDP_{t-1},\ldots LGDP_{t-k}, LINF_t, LINF_{t-1},\ldots LINF_{t-k},$

$LEXC_t, LEXC_{t-1},\ldots LEXC_{t-k}, LFDI_t, LFDI_{t-1},\ldots LFDI_{t-k})$.....(5)

Our model is now complete with five endogenous variables and five equations.

The variables have been stated in their logarithmic form to make room for easy interpretation and also to remove any non-linear relationship in the model.

4.2 METHODOLOGY

This research involves the use of time series macroeconomic data, the vast majority of which are non-stationary at their levels. The regression of non-stationary series on other non-stationary series is most likely to generate spurious regression results.

There are two techniques that can be employed to avoid spurious regression results:

(1) Cointegrating technique which was advocated by Granger and Newbold, or

(2) Transforming data to make it stationary before applying the Classical Regression techniques.

All the variables in the model will be tested for their stationarity, before issues such as cointegration which helps to examine the long run relationship between economic variables and short-run relationships are carried out.

4.3 STATIONARY AND NON-STATIONARY SERIES

A series is ***stationary*** when it has a spectrum which is finite but non zero at all frequencies. Such series are said to be integrated of order zero denoted by I(0). Regression with stationary series does not pose any serious problem in time series econometrics.

A series is ***non-stationary*** if its moments are not time invariant. One typical class of non-stationary series that is usually encountered in macroeconomics is integrated series. According to Granger (1986) " a series with no deterministic component and which has a stationary and invertible autoregressive moving average (ARMA) representation after differencing d times but non-stationary after differencing d-1 times is said to be integrated of order d, denoted by Xt~I(d)". Integrated series have permanent memory and unbounded variance.

4.4 TEST FOR STATIONARITY

Granger and Newbold (1974) and Stock and Watson (1988) have shown that running regression on non-stationary data using OLS estimation method produces spurious results.

It has therefore become imperative to test for the stationarity status of the

variables before using cointegration and Vector Error Correction Models. There are many tests that have been developed to test for stationarity. These include the Dickey-Fuller (1981) test, Augmented Dickey-Fuller test, Sarghan Bhangra Dubbin Watson (SBDW), Phillip-Paron test and the Johansen test. These tests help to identify whether the data is stationary or not stationary. We propose to use the Augmented Dickey-Fuller test in this study because the ADF-test is better than the original DF-test since the augmentation leads to empirical white noise residuals. The procedures are outlined below.

4.5 AUGMENTED DICKEY-FULLER TEST

A weakness of the original Dickey-Fuller test is that it does not take account of possible autocorrelation in the error process.

A simple solution advocated by Dickey and Fuller (1981) is to use lagged left-hand side variables as additional explanatory variables to approximate the autocorrelation. This test, called the Augmented Dickey-Fuller test and denoted conventionally as ADF is widely regarded as being the most efficient test from among the simple tests for integration and is at present the most widely used in practice. This test requires running the following regression.

$$Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-i} + \mu_t \qquad (6)$$

where Y_t is a vector of all variables of the model, μ_t is the error term, k is the number of lagged first difference terms such that μ_t is white noise. The null hypothesis here will be that Y_t has a unit root (that is, non-stationary) and the alternative is that there is no unit root i.e stationary. If the null hypothesis is accepted, it implies that the variables are non-

stationary. Stationarity could however be achieved by first differencing of the levels if the series are integrated of order one.

4.6 TESTING FOR COINTEGRATION

This test examines whether some linear combination of the non-stationary series in the regression produces a white noise process or not.

Cointegration can be tested in two ways. The first is to run a regression and investigate the residual is integrated of a lower order than the other variables. Thus, in this respect the test is limited, and testing must be done by creating logical chains of bi-variate cointegration hypotheses.

Other residual based tests try to solve at least the first problem by adjusting the test statistics in the second step, so that it always fulfills the criteria for testing the null correctly.

A better alternative to test for cointegration among more than two variables is offered by Johansen's test. We shall concentrate on the Johansen multivariate (VAR) approach because the model to be used in this study is a multivariate one.

4.7 JOHANSEN'S TEST FOR COINTEGRATION

This test is an error correction representation of the standard vector autoregressive (VAR) model. The Johansen (1988) and Johansen and Juselius (1990,1992) tests provide a procedure to examine the question of cointegration in a multivariate setting. A two-step procedure is formulated and the standard Vector Autoregressive, VAR, model is of the form.

$$X_t = A_1 X_{t-1} + \ldots\ldots + A_k X_{t-k} + \mu + \theta D_t + \varepsilon_t \qquad (7)$$

where we define X_t as a N*1 vector of the macro-variables of interest, μ is a vector of

constants, D is a vector of dummies while e_t is a vector of iid $(0,\Omega)$ error terms.

Equation (7) can be re-parameterized into an error correction model where:

$$\Delta X_t = \Gamma_1 \Delta X_{t-1} + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi X_{t-k} + \mu + \theta D_t + \varepsilon_t \quad \ldots\ldots(8)$$

where $\Gamma_i = -(I - \Pi_1 - \ldots\ldots - \Pi_i)$; $i = 1, \ldots, k-1$;

$$\Pi = -(I - \Pi_1 - \ldots\ldots - \Pi_k),$$

where I is an identity matrix. The main task here is to investigate whether the coefficients contained in the Π matrix contain long run information. Taking the number of variables in the vector X_t to be N, and hence the number of equations in the VAR, and the rank of Π matrix to be r, three cases can be distinguished:

(a) Rank (Π) = N= r ; This implies that the matrix has full rank and that the process X_t is stationary.

(b) Rank (Π) = r = 0; This implies that the Π matrix is null and hence equation (8) corresponds to the traditional differenced vector of time series variables, hence the variables are not cointegrated.

(c) Rank (Π) = r < N but not zero; This is the interesting case where the Π matrix is less than the full rank. In this case the rank, r, is equal to the number of distinct cointegrated vectors linking the variables in, as such r is known as the cointegration rank.

The Johansen's test is better than the two-step procedure in almost all aspects. The practical problems originate from choosing a correct combination of lags and dummy variables to make the residual come out as white noise. In limited sample this can be difficult, and the results might change among different specifications of the system, just as

it does in the two-step procedure.

The Johansen approach yield maximum likelihood estimators of the unconstrained cointegrating vector, and also allows one to explicitly test for the number of cointegrating vectors without relying on an arbitrary normalization.

The number of significant cointegrating vectors will help in determining the number of error correction terms which will appear in the error correction model.

4.8 THE VECTOR ERROR CORRECTION MODEL (VECM)

In a bid to avoid spurious regression results, some researchers run their regression on the first difference of non-stationary series. This is not advisable because all the information about the long run relationship among the variables at their levels are lost. The best solution therefore is to use an error correction mechanism which can help to capture both the long run and short run relationships among the variables. According to the Granger representation theorem, "if a set of variables are cointegrated then there exists a valid error correction representation of the data". The ECM can either be constructed from the cointegrating equation or one can impose long run homogeneity directly and construct the ECM directly without estimating the parameters. These two scenarios yield the same and consistent parametric estimates.

The error-correction model (ECM) is specified as follows.

$$DLEXC = \sum_{i=1}^{4} \alpha_{1i} DLEXC_{t-i} + \sum_{i=1}^{4} \beta_{1i} DLFDI_{t-i} + \sum_{i=1}^{4} \varphi_{1i} DLGDP_{t-i} + \sum_{i=1}^{4} \theta_{1i} DLINF_{t-i} +$$

$$\sum_{i=1}^{4} \rho_{1i} DLNR_{t-i} + \mu_1 + \delta_{11} ET1_{t-1} + \delta_{12} ET2_{t-1} + \Omega_{11} PIDD_t + \Omega_{12} ERPDD_t + a_1 DFIDEF_t +$$

$$b_1 DLFDBT_t + c_{11} DFINT_t + c_{12} DINT_t + \varepsilon_{1t} \qquad (9)$$

$$DLINF = \sum_{i=1}^{4} \alpha_{2i} DLINF_{t-i} + \sum_{i=1}^{4} \beta_{2i} DLEXC_{t-i} + \sum_{i=1}^{4} \varphi_{2i} DLFDI_{t-i} + \sum_{i=1}^{4} \theta_{2i} DLGDP_{t-i} +$$

$$\sum_{i=1}^{4} \rho_{2i} DLNR_{t-i} + \mu_2 + \delta_{21} ET1_{t-1} + \delta_{22} ET2_{t-1} + \Omega_{21} PIDD_t + \Omega_{22} ERPDD_t + a_2 DFIDEF_t +$$

$$b_2 DLFDBT_t + c_{21} DFINT_t + c_{22} DINT_t + \varepsilon_{2t} \quad \ldots\ldots (10)$$

$$DLFDI = \sum_{i=1}^{4} \alpha_{3i} DLFDIt\text{-}i + \sum_{i=1}^{4} \beta_{3i} DLEXCt\text{-}i + \sum_{i=1}^{4} \varphi_{3i} DLGDPt\text{-}i + \sum_{i=1}^{4} \theta_{3i} DLINFt\text{-}i$$

$$+ \sum_{i=1}^{4} \rho_{3i} DLNRt\text{-}i + \mu_3 + \delta_{31} ET1_{t-1} + \delta_{32} ET2_{t-1} + \Omega_{31} PIDD_t + \Omega_{32} ERPDD_t +$$

$$a_3 DFIDEF_t + b_3 DLFDBT_t + c_{31} DINT_t + c_{32} DFINT_t + \varepsilon_{2t} \quad \ldots\ldots (11)$$

$$DLGDP = \sum_{i=1}^{4} \alpha_{4i} DLGDP_{t-i} + \sum_{i=1}^{4} \beta_{4i} DLFDI_{t-i} + \sum_{i=1}^{4} \varphi_{4i} DLEXC_{t-i} + \sum_{i=1}^{4} \theta_{4i} LINF_{t-i} +$$

$$\sum_{i=1}^{4} \rho_{4i} LNR_{t-i} + \mu_4 + \delta_{41} ET1_{t-1} + \delta_{42} ET2_{t-1} + \Omega_{41} PIDD_t + \Omega_{42} ERPDD_t + a_4 DFIDEF_t +$$

$$b_4 DLFDBT_t + c_{41} DINT_t + c_{42} DFINT_t + \varepsilon_{3t} \quad \ldots\ldots (12)$$

$$DLNR = \sum_{i=1}^{4} \alpha_{5i} DLNR_{t-i} + \sum_{i=1}^{4} \beta_{5i} DLEXC_{t-i} + \sum_{i=1}^{4} \varphi_{5i} DLGDP_{t-i} + \sum_{i=1}^{4} \theta_{5i} DLFDI_{t-i} +$$

$$\sum_{i=1}^{4} \rho_{5i} DLINF_{t-i} + \mu_5 + \delta_{51} ET1_{t-1} + \delta_{52} ET2_{t-1} + \Omega_{51} PIDD_t + \Omega_{52} ERPDD_t + a_5 DFIDEF_t +$$

$$b_5 DLFDBT_t + c_{51} DINT_t + c_{52} DFINT_t + \varepsilon_{5t} \quad \ldots\ldots (14)$$

The advantage of the error correction model is that it does not put a priori restrictions on the model and that it separates long-run and short-run effects.

One problem that can be encountered in estimating ECM is the choice of the appropriate lag structure of the variables in the model. If different combinations of the lag structures produce white noise residual then the test for rival models will be used to select

zero. If they are, we reject the null hypothesis that 'X does not drive Y'. Secondly, we test the null hypothesis 'Y does not drive X' by running the same regression as above, but switching X and Y, and testing whether the lagged values of Y are significantly different from zero. To conclude that X drives Y, we must reject the hypothesis that 'X does not drive Y', and accept the hypothesis that 'Y does not drive X'. By incorporating the error term in the Granger Non-Causality test we hope that attention will be paid to the long run information in the data in order to get more efficient estimates. Thus, the significant co-integrating vectors together with the lagged values of the variables will be used in a multivariate GNC test to determine which variables predict each other.

In the next section, we determine the relative importance of each variable in accounting for its own behaviour and that of the other variables in the system by performing the Forecast Error Variance Decomposition Analysis

4.11 FORECAST ERROR VARIANCE DECOMPOSITION

One method of assessing the predictive power of variables is the application of the Granger Non-Causality test There is at least one serious drawback to this approach, which arises because the right-hand-side variables are not orthogonal For this reason Sims (1972) focused on a different measure of predictive power, one that is constructed from a VAR with orthogonal residuals the percentage of the variance of the forecasted variable attributable to alternative right-hand-side variables at different horizons This is often referred to as the forecast error variance decomposition. The variance decomposition of a VAR gives information about the relative importance of the endogenous variables.

4.12 IMPULSE RESPONSE FUNCTIONS

An impulse response function traces the response of an endogenous variable to a change in one of the innovations.. Specifically, it traces the effect on current and future values of the endogenous variable of a one standard deviation shock to one of the innovations. For example, consider a two-variable VAR with two period lags:

$$y_{1,t}=A_{1,1,1}y_{1,t-1}+A_{1,1,2}y_{2,t-1}+A_{2,1,1}y_{1,t-2}+A_{2,1,2}y_{2,t-2}+B_1t+\epsilon_{1,t} \quad \ldots\ldots(11)$$

$$y_{2,t}=A_{1,2,1}y_{1,t-1}+A_{1,2,2}y_{2,t-1}+A_{2,2,1}y_{1,t-2}+A_{2,2,2}y_{2,t-2}+B_2t+\epsilon_{2,t} \quad \ldots\ldots(12)$$

where $y_{1,t}$ is GDP and $y_{2,t}$ is FDI.

In such a model, a change in $\epsilon_{1,t}$ will immediately change the value of $y_{1,t}$ (GDP). It will also change all future values of GDP and the FDI through the dynamic structure of the system. If the innovations, $\epsilon_{1,t}$ and $\epsilon_{2,t}$ in the GDP and FDI equations above are not correlated with each other, the interpretation is straight forward; $\epsilon_{1,t}$ is the GDP innovation and $\epsilon_{2,t}$ is the FDI innovation. The impulse response for $\epsilon_{2,t}$ measure the effect of a one standard deviation FDI shock today on current and future GDP and FDI.

The ambiguity in interpreting impulse response functions arises from the fact that the errors are never totally uncorrelated. When the error terms are correlated they have a common component which cannot be identified with any specific variable. A somewhat arbitrary method of dealing with this problem is to attribute all of the effect of any common component to the variable that comes first in the VAR system.

In the next chapter of this thesis we consider the estimation and the interpretation of the results.

distribution. For a normal distribution, the skewness and excess kurtosis must be approximately 0 and 3, respectively.

5.2 RESULTS OF UNIT ROOT TEST

Before testing for cointegration, the order of integration of the individual time-series must be determined. Test for unit roots are performed on all of the data using the augmented Dickey-Fuller test with four lags in order to determine the stationarity of the variables we are dealing with. The null hypothesis is that the variable under investigation has a unit root, against the alternative that it does not. Tables 5.2 and 5.3 show the results of the ADF tests for the stationarity of the variables at both their log levels and first differences respectively.

TABLE 5.2 Results of Unit Root Test on log levels

VARIABLE	t-adf	LAG	ORDER OF INTEGRATION
LFDI	-1.898	4	I(1)
LGDP	-2.566	4	I(1)
LEXC	-1.795	4	I(1)
LINF	-2.164	4	I(1)
LNR	-2.441	4	I(1)
INT	-1.701	4	I(1)
FINT	-2.534	4	I(1)
FIDEF	1.961	4	I(1)
LFDBT	-2.409	4	I(1)

. t-adf * significant at 5%= -3.4478 constant and trend included

The results of the ADF tests with constant and trend included show that foreign direct investment (LFDI), gross domestic product (LGDP), price level (LINF), domestic interest rate (INT), natural resource (LNR), fiscal deficit (FIDEF), foreign debt (LFBDT), exchange rate (LEXC) and foreign interest rate (FINT) are all integrated of order one. The reason is that the calculated values are less than the tabulated values, and therefore we accept the null hypothesis of unit root in all cases. This implies that all the variables

are non-stationary in levels. The variables therefore have to be differenced once to ensure stationarity.

Table 5.3 Results of Unit Root test on 1st differences

VARIABLE	t-adf	LAG	ORDER OF INTEGRATION
DLFDI	-6.2020	4	I(0)
DLGDP	-6.7415	4	I(0)
DLEXC	-4.7110	4	I(0)
DLINF	-4.0115	4	I(0)
DLNR	-5.7826	4	I(0)
DINT	-6.5938	4	I(0)
DFINT	-4.9379	4	I(0)
DFIDEF	-4.6766	4	I(0)
DLFDBT	-8.3641	4	I(0)

t-adf : significant at 5% = -3.4481 constant and trend included

Table 5.3 above reports the results for the ADF test on first differences of all the variables. The null hypothesis of a unit root is rejected for all of the time-series since the calculated value is more than the tabulated value in all cases. We therefore accept the alternative of no unit root in all cases. It is therefore clear that all the series are stationary after first differencing.

5.3 TIME SERIES PLOT OF VARIABLES

Since the results of unit root test from Table 5.2 and 5.3 confirm non-stationarity of the variables in levels, we proceed to observe the time series plot of the variables on both their log levels and first differences. This is done to support the argument that the variables depict trend over time in levels but are stationary in first differences. The time series plot of variables at their log levels and first differences are shown in Appendix 1A and 1B.

It can be seen that all the variables at their log levels show trend overtime and display signs of non-stationarity. But the first differences of all the variables show no trend which seem to suggest stationarity in their differences.

5.4 RESULTS OF COINTEGRATION TEST AND ERROR CORRECTION MODEL

In this section we consider the results of the cointegration test and also analyse the error correction model. This helps us to determine both the short and the long run relationships that may exist among the variables. Multivariate cointegration test is performed using the Johansen Approach to determine the number of significant cointegrating vectors and also to estimate the Vector Error Correction (VEC) model.

5.4.1 RESULTS OF COINTEGRATION TEST

The cointegration test was conducted by assuming five endogenous variables in the model and also 4 lag lengths. The lag length of four is where the error terms produced a white noise process. This was arrived at after we have estimated VAR models with increasing lag lengths, saved the estimated residual, and performed both normality and serial correlation tests on these estimated residuals. The final model was selected among alternative lag length specification on the basis of both normality and serial correlation tests on the estimated residuals. It was also assumed that there was a linear deterministic trend in the data. Table 5.4 below reports the results of Johansen Cointegration Test.

Table 5.4 Johansen Cointegration Test Results

Sample: 1966:1 1996:4
Series: LFDI LGDP LEXC LINF LNR
Lag interval: 1 to 4

Eigenvalue	Likelihood Ratio	5 percent critical value	1 percent critical value	Hypothesized No. of CE(S)
0.301909	118.3214	87.31	96.58	None**
0.251222	75.55211	62.99	70.05	At most 1**
0.165497	41.12395	42.44	48.45	At most 2
0.098130	19.59465	25.32	30.45	At most 3
0.059531	7.303771	12.25	16.26	At most 4

*(**) denotes the rejection of the hypothesis at 5%(1%) significance level
L.R. test indicates 2 cointegrating equation(s) at 5% significance level.

For the cointegration test, the null hypothesis is that there is at most two cointegrating vectors and the alternative hypothesis is that there is no cointegrating vectors. From table 5.4 above, the null hypothesis of at most two cointegrating vectors is accepted in favour of no cointegrating vectors at the 1% significance level, since the calculated value of 41.12 is less than the tabulated value of 48.45 (i.e. 41.12<48.45). We therefore accept the null hypothesis against the alternative.

The estimated unnormalized cointegrating coefficients for the two cointegrating vectors are also shown in Table 5.5 below.

Table 5.5 Unnormalized Cointegrating Coefficients.

LFDI	LGDP	LEXC	LINF	LNR
0.303549	-5.919160	-0.274911	-0.458763	0.361316
0.117784	1.413492	-0.722455	0.261241	0.758414

These two rows of coefficients in the above Table 5.4 were used to estimate or generate the two error terms Et1 and Et2, respectively. These two error terms were used in the general VEC model which was reduced parsimoniously to obtain the preferred VEC model for each equation.

5.4.2 RESULTS OF VEC MODEL

In estimating the VEC model, the log of the endogenous variables enter in their first differences. i.e. DLFDI, DLGDP, DLEXC, DLINF, DLNR. We then allowed the model to hinge on the long run solution. The error correction terms from the 2 cointegrating equations were lagged once and introduced into the VEC model to estimate the speeds of adjustment of the various markets to their long run equilibria. The error term, for instance in the FDI equation reflects the impact on FDI for having the growth in the real output, the domestic price level, the exchange rate and the natural resources out of their long run trend.

Besides the five endogenous variables, the following variables—fiscal deficit (FIDEF), foreign debt (FDBT), foreign interest rate (FINT), domestic interest rate (INT), and two dummy variables for Political instability (PIDD) and the Economic Recovery Programme (ERPDD) were also considered.

The Full Information Maximun Likelihood estimation procedure was used to estimate the system of equations simultaneously. The general VEC model was reduced parsimoniously until the most preferred model was derived. Table 5.6 to Table 5.10 below show the results of the short run dynamic preferred models.

Table 5.6 Results of Parsimonious VEC Model for Exchange Rate (DLEXC)

Variable	Coefficient	Std. Error	t-value	t-prob	HCSE
DLEXC-1	-0.13667	0.081480	-1.677	0.0264	0.059125
DLEXC-2	-0.17802	0.078022	-2.282	0.0245	0.072299
DLEXC-3	-0.1825	0.073400	-2.469	0.0151	0.074000
DLGDP-3	2.1402	0.99950	-2.141	0.0345	0.90042
DLINF-1	-0.58619	0.18653	-3.143	0.0022	0.30620
DLINF-2	1.1041	0.19631	5.625	0.0000	0.55579
DLNR-2	0.11255	0.027884	4.036	0.0001	0.054212
DLNR-3	0.10371	0.029168	3.556	0.0006	0.049454
CONSTANT	0.88750	0.30201	2.939	0.0040	0.52286
ET1-1	-0.057058	0.019018	-3.000	0.0034	0.033735
DINT	0.24532	0.15423	1.542	0.1242	0.267221
PIDD	-0.0033764	0.021771	-0.155	0.8770	0.014897
ERPDD	0.13716	0.035365	3.878	0.0002	0.066735

Diagnostic Test Result

AR 1-5F(5, 84) = 1.7982 (0.0923)
ARCH 4 F(4, 81) = 0.0362 (0.9974)
Normality Chi (2) = 2.5534 (0.6923)
Xiy (56, 32) = 0.8435 (0.8973)
Xi *Xj F(64, 66) = 0.8623 (0.7456)
RESET F(1, 107) = 10.7845 (0.7856)

Table 5.7 Result of Parsimonious VEC model for Foreign Direct Investment (DLFDI)

Variable	Coefficient	Std. Error	t-value	t-prob	HCSE
DLEXC-4	-0.32346	0.12262	-2.638	0.0096	0.062111
DLFDI-1	0.34988	0.085011	4.116	0.0001	0.15742
DLGDP-2	4.4687	1.5689	-2.853	0.0033	1.2346
CONSTANT	-1.3871	0.51108	-2.714	0.0077	0.42608
DLFDBT	-2.2709	0.95883	2.386	0.0196	1.1739
ET1-1	-0.085311	0.031946	-2.670	0.0087	0.026714
PIDD	0.031585	0.035266	0.896	0.3724	0.027161
ERPDD	-0.087297	0.057001	-1.532	0.1286	0.044543

Diagnostic Test Result

AR 1-5F(5, 84) = 2.0137(0.0849)
ARCH 4 F(4, 81) =1.9989(0.1025)
Normality Chi (2) =4.1336(0.5234)
Xiy (56, 32) = 1.7155(0.5511)
Xi *Xj F(34, 60)=0.6572(0.8546)
RESET F(1, 100) = 2.5364 (0.2365)

Table 5.8 Result of Parsimonious VEC Model for Aggregate Supply (DLGDP)

Variable	Coefficient	Std. Error	t-value	t-prob	HCSE
DLEXC-2	-0.0088218	0.0046655	-1.891	0.0213	0.0029836
DLFDI-2	-0.0077554	0.0031829	-2.437	0.0165	0.0030125
DLGDP-1	0.40363	0.065533	6.159	0.0000	0.071365
DLGDP-4	0.16820	0.060552	2.778	0.0065	0.060767
DLINF-3	0.064622	0.012291	-5.258	0.0000	0.013904
CONSTANT	0.038625	0.019712	1.959	0.0526	0.018213
ET2-1	-0.0177336	0.0020454	-3.781	0.0003	0.0018743
DLFDBT	0.19029	0.034063	5.586	0.0000	0.038227
DFINT	0.0264427	0.00071366	2.022	0.0057	0.0007367
PIDD	-0.00043891	0.0013746	-0.319	0.7501	0.0013479
ERPDD	0.0045691	0.0021704	2.105	0.0376	0.0021464

Diagnostic Test Result

AR 1-5F(5, 84) = 1.4834(0.8354)
ARCH 4 F(4, 81)=0.7757(0.5446)
Normality Chi (2) =3.12739(0.1184)
Xiy (56, 32) = 0.8654(0.6542)
Xi *Xj F(64, 66) = 0.6587(0.8652)
RESET F(1, 110)=2.2145(0.1362)

Table 5.9 Result of Parsimonious VEC Model for Aggregate Demand (DLINF)

Variable	Coefficient	Std. Error	t-value	t-prob	HCSE
DLEXC-3	-0.079524	0.030088	-2.643	0.0094	0.019883
DLFDI-1	-0.063225	0.020419	-3.096	0.0025	0.018841
DLGDP-1	-2.0401	0.45988	-4.436	0.0000	0.46942
DLGDP-2	2.4961	0.46972	5.314	0.0000	0.49385
DLGDP-4	-1.0904	0.42475	-2.567	0.0116	0.47368
DLNR-1	-0.057351	0.017601	-3.258	0.0015	0.016044
CONSTANT	0.14514	0.15532	0.934	0.3521	0.16086
ET2-1	-0.095309	0.019210	4.961	0.0000	0.016933
DLFDBT	0.88355	0.23276	3.796	0.0002	0.27770
PIDD	0.0023501	0.0086345	0.272	0.7860	0.0070461
ERPDD	-0.00079300	0.015075	-0.053	0.9581	0.021205

Diagnostic Test Result

AR 1-5F(5, 84) =1.1716(0.8695)
ARCH 4 F(4, 81)=2.3934(0.0573)
Normality Chi (2) =4.271(0.2145)
Xiy (56, 32) =0.74424(0.8356)
Xi *Xj F(65, 44) =1.4523(0.1294)
RESET F(1, 109)=1.5426(0.2232)

Table 5.10 Results of Parsimonious VEC Model for Natural Resources (LNR)

Variable	Coefficient	Std. Error	t-value	t-prob	HCSE
DLEXC-1	-0.52699	0.19197	-2.745	0.0071	0.12367
DLEXC-4	-0.52802	0.18106	-2.916	0.0043	0.16468
DLINF-2	1.9643	0.49140	3.997	0.0001	0.48853
DLINF-4	1.6448	0.49425	3.328	0.0012	0.51941
DLNR-4	0.32390	0.070499	4.594	0.0000	0.084916
CONSTANT	0.13194	0.76323	0.173	0.8631	0.85250
ET2-1	-0.067665	0.085748	-7.891	0.0000	0.084552
PIDD	-0.095365	0.054482	-1.750	0.0029	0.047150
ERPDD	0.26871	0.089622	2.998	0.0034	0.11336

Diagnostic Test Result

AR 1-5F(5, 84) = 1.8756(08975)
ARCH 4 F(4, 81) =1.5959(0.1833)
Normality Chi (2) =2.5569(0.3452)
Xiy (56, 32) = 0.8809(0.8564)
Xi *Xj F(64, 66) =108652(0.4562)
RESET F(1, 106) =2.3564(0.1235)

From the VEC model the error-correction terms are interpreted to represent disequilibrium in the various markets: i.e exchange rate market, product market and labour market or the constraints are not satisfied. i.e. the investment and natural resource constraints. The coefficients of the error correction terms which are significant will explain the feedback effects of the disequilibrium in the various markets. The estimated VEC models are therefore used to show the fact that the endogenous variables really adjust to shocks from the various markets or not. The coefficients of the error terms denote the speed of adjustment of the various markets to the long run equilibrium values of the endogenous variables.

The results of the VEC model for the exchange rate shows that any change in the growth rate of exchange rate (100%) has a feedback effect of about 13%, 17% and 18% respectively for the 1st, 2nd, and 3rd quarters. A change in the real output growth in the 3rd quarter also has a positive impact on the growth rate of exchange rate of about

214%. The rate of change of inflation in the 1st and 2nd quarters cause the rate of change of the exchange rate to vary by about (-58%) and 110% respectively. But changes in the growth rate of natural resources in the 2nd and 3rd quarters lead to positive changes of 11% and 10% respectively in the growth rate of exchange rate. Any change in the domestic interest rate in the short-run do not have any significant effect on the rate of growth of exchange rate. The speed of adjustment of the exchange rate towards it's long-run equilibrium when distorted by instabilities in the product market is about 5.7%. Political instabilities have no effect on the exchange rate. ERP has an impact of about 13% on the rate of change of the exchange rate.

From Table 5.7, it can be seen that a change in the growth rate of FDI tend to produce a feedback effect of 34.9% in the first quarter. A change in the growth rate of exchange rate in the 4th quarter affects the growth of foreign direct investment by about (-32%). A change in the growth rate of real output in the 2nd quarter has a positive effect of about 446% on FDI growth. Change in the growth rate of foreign debt in the short-run induces a change in the growth rate of FDI of about (-227%). It can be seen from Table 5.7 that political instability had no significant impact on FDI growth in Ghana. The introduction of the ERP also has no impact on FDI growth. Also the speed of adjustment of the foreign direct investment towards its long run equilibrium when distorted by disequilibrium in the exchange rate market is about (-8.5%).

The model for aggregate supply depicted in Table 5.8 shows that changes in the growth rate of output in the 1st and 4th quarters produce feedback effect of about 40% and 16.8% respectively. A change in the growth rate of exchange rate in the 2nd quarter causes the growth rate of output to vary by about(- 0.8%). A change in the growth rate of

foreign direct investment in the 2nd quarter however, has an effect of (-0.7%) on the growth rate of real output. But the rate of inflation in the 3rd quarter leads to a positive change of 6.4% on the growth rate of real output. The growth rate of foreign debt and a change in the foreign interest rate also had a significant positive impact of about 19% and 2.6% respectively on the growth rate of real output. The speed at which the growth rate of real output adjusts towards its long run equilibrium when disturbed from the labour market is about 1.7%. Political instabilities have had no significant impact on the growth rate of output. But the ERP have had a significant impact on the growth rate of real output of 0.4%.

The results of the VEC model for aggregate demand showed that there is no feedback effect of the rate of inflation . A change in the growth rate of exchange rate in the 3rd quarter has an impact on the rate of inflation of about 8%. In the short-run, any change in the foreign direct investment in the 1st quarter causes the rate of inflation to change by about (-6%). Changes in the growth rate of GDP in the 1st, 2nd and 4th quarters cause changes of (-204%), 249% and (-109%) respectively on the rate of inflation. A change in the growth rate of natural resources has an impact of (-5.7%) on the rate of inflation in the 1st quarter. In the short-run, the growth rate of foreign debt induces a change of 88% on the rate of inflation. The error correction term of about 9.5% measures the speed at which the rate of inflation adjusts towards its long run equilibrium when the equilibrium is distorted by a shock from the exchange rate market. Political instabilities do not have any significant effect on the rate of inflation. The introduction of the ERP also do not have any significant effect on the rate of inflation.

Lastly, the VEC for the natural resources constraint shows a feedback effect of about 32% in the 4th quarter. Changes in the growth rate of the exchange rate have a negative effect of 52.6%, and 52.8% in the 1st and 4th quarters respectively on the growth rate of natural resources. The rate of inflation in the 2nd and 4th quarters have an impact of 196% and 164% respectively on the growth rate of natural resources. The speed of adjustment of natural resources to its long run trend is (-67%). Political instabilities in Ghana has a significant impact of about (-9.5%) on the growth rate of natural resources. The Economic Recovery Programme has a positive influence of 26.8% on the growth rate of natural resources.

5.4.3 ESTIMATION OF LONG RUN EQUATIONS

The estimated long run equations or functions calculated from the parsimonious VEC models for the variables are as specified in Table 5.11 below. The computed equations (pass through equations) are for Aggregate Demand (LINF), Aggregate Supply (LGDP), Exchange Rate (LEXC), Foreign Direct Investment (LFDI), and Natural Resources (LNR).

The 'a priori' signs for the coefficients of the relevant endogenous variables are as follows: In the exchange rate equation, the coefficient of inflation is expected to be positive, the coefficient of natural resource growth rate to be negative and the coefficient of the real output growth rate to be positive. In the FDI equation, the coefficient of the exchange rate growth rate is expected to have a negative sign and the coefficient of real output growth rate to have a positive sign. For the aggregate demand equation, the coefficient of the exchange rate growth rate is expected to be negative, the coefficient of FDI growth rate to be positive, the coefficient of the natural resource growth rate to be

positive and the coefficient of the real output growth rate to be negative. For the aggregate supply equation also, the coefficient of the exchange rate is expected to be negative, the coefficient of the FDI growth rate to be positive and the coefficient of the inflation rate to be positive. Lastly, in the natural resource equation, the coefficient of the exchange rate growth rate is expected to be negative and the coefficient of the inflation rate is expected to be positive.

Table 5.11 Estimated Long Run Equations from preferred VEC Model.

1. $\Delta LEXC = 0.593 + 0.346\Delta LINF + 0.144\Delta LNR + 1.429\Delta LGDP$
2. $\Delta LFDI = -2.134 - 0.498\Delta LEXC + 2.393\Delta LGDP$
3. $\Delta LINF = 0.145 - 0.079\Delta LEXC - 0.063\Delta LFDI - 0.095\Delta LNR - 0.634\Delta LGDP$
4 $\Delta LGDP = 0.090 - 0.021\Delta LEXC - 0.038\Delta LFDI + 0.151\Delta LINF$
5. $\Delta LNR = 0.195 - 1.560\Delta LEXC + 5.338LINF$

Equation 1 estimates the long run behaviour of the exchange rate . By examining the coefficients we notice that a 100% increase or decrease in the rate of inflation will induce the rate of change of the exchange rate to also increase or decrease by 34.6%. The growth of natural resources also impact positively on the growth rate of exchange rate such that, a 100% increase or decrease will cause the growth rate of exchange rate to appreciate or depreciate by 14.4%. The real output growth also has a positive effect of 143% on the rate of change of the exchange rate.

Equation 2 in Table 5.11 also depicts the long run behaviour of foreign direct investment. The growth rate of FDI has an inverse relationship with the growth rate of the exchange rate and a positive relationship with the growth rate of the real output. Thus, a 100% increase or decrease in the rate of change of the exchange rate will lead to a 49.8%

decrease or increase in the growth rate of foreign direct investment. Also a 100% increase or decrease in the growth rate of real output will cause a 239% increase or decrease in the growth rate of foreign direct investment.

The long run behaviour of the rate of inflation is depicted by equation 3 in Table 5.11 above. The rates of growth of the exchange rate, foreign direct investment, natural resources and real output are all inversely related to the rate of inflation. If the rate of growth of the exchange rate increase or decrease by 100%, the rate of inflation will also decrease or increase by 8%. Also if the rate of growth of foreign direct investment increase or decrease by 100%, the rate of inflation will also decrease or increase to the tune of 6.3%. An increase or decrease in the growth rate of natural resources by 100% will induce a decrease or increase of about 9.5% in the rate of inflation. The rate of inflation will also decrease or increase by 63.4% if there is a 100% increase or decrease in the growth rate of the real output.

The aggregate supply equation is also specified in equation 4. Here, there is a negative relationship between the changes in the growth rate of the exchange rate and the growth rate of foreign direct investment on the one hand, and real output growth on the other. But there is a positive relationship between the rate of inflation and the growth rate of the real output. Therefore, 100% increase or decrease in the growth rate of the exchange rate will cause the real output growth to decrease or increase by 2.1%. Also a 100% increase or decrease in the growth rate of FDI will induce a decrease or increase of 3.8% in the real output growth. An increase or decrease in the rate of change of inflation by 100% will result in an increase or decrease in the real output growth of 15.1%.

The last equation in Table 5.11 is for the natural resource constraint. The growth rate of natural resources is negatively related to the growth rate of the exchange rate and positively related to the rate of inflation. If the growth rate of the exchange rate increase or decrease by 100%, the growth of natural resources will also decrease or increase by 156%. But a 100% increase or decrease in the rate of change of inflation will lead to an increase or decrease of 533.8% in the growth of natural resources.

5.5 RESULTS OF GRANGER NON-CAUSALITY TEST.

The Granger non-causality test was conducted on the first differences of the logarithm of the variables which are lagged 4 times. Trend was also introduced in the Granger Non-causality Test. This test helps to determine the direction of causality among the five endogenous variables or the inter-links among them. The results of the Granger Non-causality test are shown in Table 5.12 below.

Table 5.12 Results of Granger Non-Causality Test. (Probability Values)

VARIABLES	LAGS	ΔLEXC	ΔLFDI	ΔLINF	ΔLGDP	ΔLNR
ΔLEXC, $Et2_{-1},T$	4	0.5177	0.0758	0.0238	0.9443	0.0000
ΔLFDI, $Et1_{-1},T$	4	0.7035	0.0000	0.1111	0.8556	0.0001
ΔLINF, $Et1_{-1},T$	4	0.0002	0.2892	0.0030	0.0029	0.0000
ΔLGDP, $Et1_{-1},T$	4	0.5132	0.0498	0.0000	0.0000	0.0000
ΔLNR, $Et1_{-1},T$	4	0.0007	0.1683	0.0032	0.0663	0.0000

From the third column of this table, it can be seen that the changes in the growth rate of the exchange rate are predicted only by the rate of inflation and the growth of natural resources. This shows that the rate of growth of the exchange rate is being driven by the rate of inflation and the rate of growth of natural resources. From the fourth column of Table 5.12, it is clear that a change in the growth rate of FDI is also predicted by its own lagged values, the growth rate of exchange rate and real output growth but not by the rate of inflation and growth of natural resources. Any change in the rate of

inflation is predicted by its own lagged values, the growth rate of exchange rate, growth in GDP and natural resource growth. Moreover, real output growth is predicted by the rate of inflation, its own lagged values and growth in natural resources. Lastly, the growth rate of natural resources is predicted by its own lagged values, growth rate of FDI, rate of inflation, the growth rate of exchange rate and growth in real output.

The following conclusions can be drawn from the Granger Non-causality test:

1. There is a bi-directional causality between the growth rate of exchange rate and the rate

of inflation.

2. The rate of inflation and the growth rate of the real output predict each other

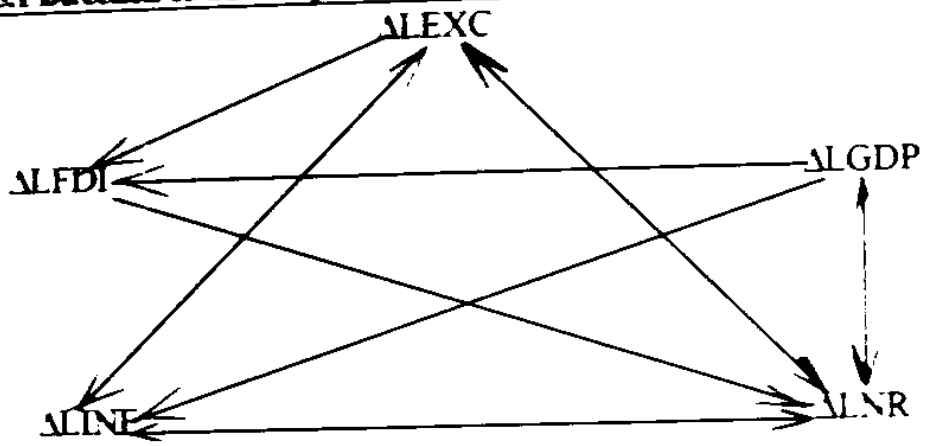
3. The growth rate of the exchange rate and the growth rate of natural resources drive each other.

4. The rate of inflation and the growth rate of natural resources Granger-cause each other.

5. The growth rate of real output and the growth rate of natural resources predict each other.

These conclusions can be presented diagrammatically as follows in figure 5.1 below

Figure 5.1 Direction of Causality of Endogenous Variables.



Note: The double-headed arrows depicts a bi-directional causality between variables while single-headed arrows indicates a uni-directional causality

Policy implications can also be drawn from the macroeconomic variables in terms of their causal relationships discussed above

To control inflation in Ghana, for example, the government's policies must be directed towards the regulation of the labour and foreign exchange markets and the exploitation of natural resources. This is supported by the fact that innovations or disequilibrium in any of these markets will affect directly the rate of inflation.

Secondly, if the government wants to stabilise the exchange rate market from downward plunge (depreciation of domestic currency), then policies must be directed towards controlling domestic inflation rate through price controls. Also government can embark upon policies which will enhance the exploitation of the natural resources and boost exports. This will lead to the appreciation of the domestic currency or improve the value of the domestic currency as more foreign exchange is attracted. Any attempt to control the investment market or the labour market to appreciate the value of

the domestic currency may not work. This is because there is no direct relationship between the exchange rate market and the investment or labour market.

Moreover for the government to attract more investors, then it should embark upon labour enhancing policies or improve the labour market. Manpower development policies such as training of more technically-skilled labour will be a step in the right direction. This will help to improve the real income of the people and in turn stimulate more foreign direct investment flow. This is because the labour market drives the investment sector as illustrated by Figure 5.1 above.

The government can also influence the foreign investment market through the exchange rate market. Therefore, access to foreign exchange by foreign investors is very important. The liberalisation of the foreign exchange market through the establishment of private Forex Bureaux is therefore a good policy change. The authorisation of foreign investors to operate foreign currency account with banks in Ghana under the Free Zones Act, 1995 (Act 504) will also enhance the possibility of foreign investors gaining access to foreign currency and this will stimulate foreign investment into the Free Zones enclave.

Also the unconditional transferability through any authorised dealer bank in freely convertible currency of dividends or net profits attributable to the investors, and the remittance of proceeds in the event of sale or liquidation of the enterprise or any interest attributes to the investment as specified under the G.I.P.C Act, 1994 (Act 478) will also boost investor confidence in terms of access to foreign currency.

Also to boost the income level of the people, there is the need for policies that will enhance the exploitation of natural resources. Here, the revision of the investment

code and the Mining and Minerals law in Ghana is a step in the right direction. This will attract more investors into the extractive industry for the harnessing of our natural resources. The revision of the Ghana Land Policy and the Land title registration exercise currently going on will also boost the morale of investors and curb the numerous land litigation which scares and frustrate investors in Ghana. This will also eliminate the difficult accessibility to land for agricultural, industrial, commercial and residential development purposes due to conflicting claims to ownership, and varied outmoded land disposal procedures.

To enhance the exploitation of natural resources, there is the need to stimulate the inflow of FDI, and also improve the income level of the people Expansionary fiscal policies which will stimulate inflationary expenditures in Ghana will also improve the income level of the people by expanding output and therefore enhance natural resource exploitation.

Lastly, for the government to increase the aggregate supply, then it must concentrate on policies that will fuel the rate of inflation such as expansionary fiscal policies.

5.6 RESULT OF FORECAST ERROR VARIANCE DECOMPOSITION

The variance decomposition of a VAR gives information about the relative importance of the random innovations Tables 5.13 to 5.17 below reports the results of the Forecast Error Variance Decomposition of the five endogenous variables at various quarters.

Table 5.13 Forecast Error Variance Decomposition of DLEXC (%)

Period	S.E	DLEXC	DLFDI	DLGDP	DLINF	DLNR
2	0.146140	87.732	0.485	2.669	6.144	2.970
4	0.152909	65.149	0.898	4.909	18.768	10.274
8	0.165259	62.268	1.020	5.116	19.618	11.978
12	0.167051	60.578	1.110	5.606	19.335	13.371
16	0.167385	59.961	1.146	5.836	19.249	13.808
20	0.167513	59.672	1.161	5.964	19.229	13.973

Table 5.14 Forecast Error Variance Decomposition of DLFDI (%)

Period	S.E	DLEXC	DLFDI	DLGDP	DLINF	DLNR
2	0.146140	0.148	98.138	0.377	0.248	1.089
4	0.152909	0.479	92.395	2.779	1.886	2.459
8	0.165259	3.444	85.956	5.423	2.702	2.475
12	0.167051	3.809	84.898	5.585	2.992	2.715
16	0.167385	3.801	84.683	5.664	3.025	2.828
20	0.167513	3.804	84.573	5.713	3.039	2.870

Table 5.15 Forecast Error Variance Decomposition of DLGDP (%)

Period	S.E	DLEXC	DLFDI	DLGDP	DLINF	DLNR
2	0.146140	2.841	0.387	91.487	0.923	4.362
4	0.152909	2.546	1.091	85.902	5.565	4.896
8	0.165259	2.841	1.608	81.570	8.403	5.577
12	0.167051	2.866	1.633	80.593	8.949	5.958
16	0.167385	2.876	1.654	80.209	9.156	6.106
20	0.167513	2.867	1.663	80.045	9.245	6.178

Table 5.16 Forecast Error Variance Decomposition of DLINF (%)

Period	S.E	DLEXC	DLFDI	DLGDP	DLINF	DLNR
2	0.146140	0.465	2.035	7.155	90.095	0.249
4	0.152909	2.329	2.197	9.319	85.168	0.969
8	0.165259	2.991	2.315	14.507	77.493	2.694
12	0.167051	3.024	2.272	16.036	75.556	3.111
16	0.167385	3.001	2.276	16.369	75.044	3.309
20	0.167513	2.993	2.273	16.526	74.795	3.414

Table 5.17 Forecast Error Variance Decomposition of DLNR (%)

Period	S.E	DLEXC	DLFDI	DLGDP	DLINF	DLNR
2	0.146140	11.377	0.323	0.231	0.428	87.732
4	0.152909	10.314	0.812	1.178	7.538	80.158
8	0.165259	8.639	2.898	2.299	6.867	79.296
12	0.167051	8.146	2.961	3.333	6.931	78.629
16	0.167385	7.939	3.019	3.877	7.119	78.045
20	0.167513	7.846	3.038	4.168	7.261	77.669

From the variance decomposition results in table 5.13, the variance decomposition of the exchange rate shows that about 60% of the variations in the growth rate of exchange rate are explained by its own innovations, 19% by shocks in the rate of inflation, and 1.2% by the innovations in FDI growth. The real output growth and growth in natural resources also account for 6% and 14% respectively. So the most important variable in controlling the exchange rate fluctuations is the rate of inflation.

Also we see that variations in the growth rate of FDI comes mostly from its own innovations. Thus, 85% of variations in the growth rate of FDI are explained by its own innovations, and 6% by shocks to the real output growth. Growth in natural resources accounts for 3% of variations in the growth rate of FDI while the rate of inflation and the growth rate of the exchange rate account for 3% and 4% variations respectively. So the most important variable in controlling the foreign direct investment fluctuations is the real output.

The real output growth explains about 80% of its innovations, followed by the rate of inflation which accounts for about 9% variations and the growth rate of natural resources accounts for about 6% variations. The growth rate of exchange rate and the growth rate of FDI takes care of 3% and 2% variations respectively. So the most important variable in controlling the real output fluctuations is the rate of inflation.

Variance decomposition of the rate of inflation also shows that about 75% of the variations are accounted for by its own innovations, 3% by the growth rate of exchange rate and 3% by the growth rate of natural resources. About 2% and 17% of the variations in the rate of inflation was explained by the innovations in the growth rate of FDI and the growth rate of real output, respectively. So the most important variable in controlling the fluctuations in the rate of inflation is the real output.

Growth in natural resources explains about 78% of its own innovations, followed by the growth rate of exchange rate about 8%, and rate of inflation about 7%. The remaining innovation in natural resources growth rate is explained by the growth rate of FDI about 3% and the growth rate of real output about 4%. So the most important variable in controlling the natural resource fluctuations is the exchange rate. The next section of this chapter discusses the results of the impulse Response functions.

5.7 RESULT OF IMPULSE RESPONSE FUNCTIONS

An impulse response function is studied to determine the response of an endogenous variable to an unanticipated change in one of the endogenous variables. This traces the effect on the future values of the endogenous variable to one standard deviation shock in one of the innovations of the endogenous variables in the current period. Tables 5.18 to 5.22 below show the results of the Impulse Response Functions for each variable.

Table 5.18 Response of DLEXC to one S.D Innovations

Period	DLFDI	DLGDP	DLINF	DLNR
2	-0. 0032	-0.0118	-0.0225	0.0156
4	0.0054	-0.0059	0.0036	0.0081
8	-0.0036	-0.0067	0.0008	0.0006
12	-0.0019	-0.0046	0.0029	0.0024
16	-0.0014	-0.0031	0.0024	0.0018
20	-0.0208	-0.0022	0.0431	0.0015

Table 5.19 Response of DLFDI to one S.D Innovations

Period	DLEXC	DLGDP	DLINF	DLNR
2	0.0056	0.0089	-0.0073	-0.0153
4	-0.0037	-0.0206	-0.0176	0.0015
8	0.0043	0.0092	-0.0021	0.0032
12	0.0023	-0.0015	-0.0050	0.0008
16	-0.0106	0.0184	0.0215	-0.0025
20	0.0321	0.0450	-0.0124	-0.0154

Table 5.20 Response of DLGDP to one S.D Innovations

Period	DLEXC	DLFDI	DLINF	DLNR
2	0.0012	0.0044	0.0049	0.0015
4	0.0028	-0.0545	-0.0013	0.0047
8	0.0859	0.0037	-0.0087	0.0225
12	0.0595	-0.0012	-0.0003	-0.0505
16	0.0594	0.0646	-0.0028	-0.7095
20	-0.0396	0.0456	-0.0018	-0.0782

Table 5.21 Response of DLINF to S.D Innovations

Period	DLEXC	DLFDI	DLGDP	DLNR
2	-0.0026	-0.0024	-0.0091	0.0019
4	-0.0032	0.0022	0.0058	0.0028
8	-0.0015	0.0008	0.0661	0.0011
12	-0.0003	0.0002	0.0017	0.0014
16	-0.0790	0.0004	0.0011	0.0009
20	0.0540	0.0315	0.0234	0.0723

Table 5.22 Response of DLNR to S.D Innovations

Period	DLEXC	DLFDI	DLGDP	DLINF
2	-0.0212	0.0106	-0.0019	-0.0152
4	0.0478	0.0118	0.0199	-0.0348
8	-0.0027	0.0049	0.0267	-0.0121
12	0.0003	0.0074	0.0218	-0.0054
16	0.0004	0.0052	0.0169	-0.0037
20	0.0005	0.0432	0.0134	-0.0310

From the impulse response results, we notice that the response of the growth rate of exchange rate due to any unanticipated changes in the growth of FDI and the rate of inflation are 2.1% and 4.3% over the five year period. The response of the growth rate of exchange rate to innovations in the growth rate of real output and natural resources are less than 1% (negligible). However, the impulse response graph in Appendix K shows

that innovations in foreign direct investment growth, real output growth, rate of inflation and growth in natural resources all have a permanent effect on the growth rate of exchange rate.

We can also realise from the impulse response Table 5.19 that the response of growth in foreign direct investment over the five year period to unanticipated changes in the growth rate of exchange rate, growth of real output, rate of inflation and natural resources growth are 3.2%, 4.5%, (-1.2%) and (-1.5%) respectively. Thus the growth of foreign direct investment responds more to fluctuations in the growth rates of real output and exchange rate. The impulse response graph in Appendix K shows that innovations in the growth rate of exchange rate and growth rate of natural resources have temporary effect on the growth rate of foreign direct investment in Ghana. However, innovations in the growth rate of real output and the rate of inflation have a permanent effect on foreign direct investment in Ghana.

The response of real output growth over the five year period to unanticipated changes in the growth rate of exchange rate, rate of growth of FDI, and the growth rate of natural resources are (-3.9%), (-4.5%) and (-0.7%) respectively. But the response of real output growth to unanticipated changes in the rate of inflation is less than 1% (negligible). Moreover, the impulse response graph in Appendix K shows that innovations in the growth rate of foreign direct investment, the rate of inflation and the rate of growth of natural resources all leave a permanent effect on the growth of real output. However, the innovations in the growth rate of exchange rate has a temporary effect on the rate of growth of real output.

Similarly, the response of the rate of inflation to innovations in the growth rate of exchange rate, growth rate of foreign direct investment, real output growth and rate of growth of natural resources are 5.4%, 3.1%, 2.3% and 7.2% respectively. This implies that rate of inflation responds more to the rates of growth of natural resources and exchange rate. The impulse response graph of the rate of inflation to innovations in the growth rate of exchange rate, growth rate of FDI, growth rate of real output and growth rate of natural resources in Appendix K indicate that innovations in the growth rate of real output and the growth rate of natural resources have a permanent effect on the rate of inflation while innovations in the growth rates of foreign direct investment and exchange rate have a temporary effect on the rate of inflation.

Lastly, the response of growth of natural resources to innovations in the growth rate of FDI, growth rate of real output and the rate of inflation are 4.3%, 1.3% and 3.1% respectively. This shows that the natural resource growth responds more to the growth rate of foreign direct investment and the rate of inflation. The effect of an unanticipated changes in the growth rate of exchange rate on the growth rate of natural resource is less than 1% (negligible). The impulse response graph in Appendix K shows that innovations in the growth rate of FDI, growth rate of real output, and rate of inflation have a permanent effect on the growth rate of natural resources. However, innovations in the growth rate of exchange rate has a temporary effect on the growth rate of natural resources.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

6.0 INTRODUCTION

This chapter looks at the summary, conclusions and policy implications of the study. The first section summarises the entire work done which is followed by the research findings. The conclusion of this chapter considers the Policy implications and areas of further research.

6.1 SUMMARY OF THE STUDY

In this study, some elements of the neoclassical and eclectic approaches are used to develop a dynamic simultaneous equation model. Multivariate cointegration test is performed using the Johansen Approach to determine the number of significant cointegrating vectors and also to estimate the Error Correction model in order to capture both the short run and long run relationships that may exist among the variables. The system is estimated simultaneously by using the Full Information Maximum Likelihood (FIML) method.

In the exchange rate market, the long run determinants are the rate of inflation, natural resource growth and the real output growth. Foreign direct investment equilibrium is determined by the rate of growth of the exchange rate and real output growth. The real output is positively related to the FDI. In the long run, sustained growth in real output will stimulate foreign direct investment in Ghana. Also, real depreciation of the local currency affects foreign direct investment negatively through its effect on the real cost of capital and real output. The rate of inflation is also determined by the rate of growth of the exchange rate, the rate of growth of foreign direct investment, the natural resource growth

and the rate of growth of real output. The rate of growth of the exchange rate, the rate of growth of foreign direct investment and the rate of inflation are also seen as the long run determinants of the rate of growth of real output in the labour market. Lastly, the growth rate of the exchange rate and the rate of inflation were found to be the long run determinants of the natural resources.

The unit root test for the levels of the endogenous variables shows that the data were non-stationary and therefore they had to be differenced once to make them stationary because they were all integrated of 1st order. The results of the cointegration test with trend also shows that there are two significant cointegrating vectors at the 1% significance level. The cointegrating vectors were used in the error correction model which was estimated in the general form and then reduced parsimoniously to obtain the preferred model. The speed of adjustment of the exchange rate towards its long run equilibrium when distorted by instabilities in the product market is about 5.7%. It was also noticed that the exchange rate market can disturb the equilibrium condition in the capital market. The speed of adjustment of the investment towards its long run equilibrium when distorted by disequilibrium in the exchange rate market is about (-8.5%). Also the speed at which the growth rate of real output adjusts towards its long run equilibrium when disturbed from the labour market is about 1.7%. The rate of inflation is found to respond to disequilibrium in the exchange rate market by about 9.5% whereas the speed of adjustment of the growth rate of natural resources to its long run equilibrium value is (-6.7%).

From the VEC model, the long run equations for the five endogenous variables were also estimated. In sum, 100% change in the rate of inflation, growth rate of natural

resources and the growth rate of real output results in 34.6%, 14.4% and 143% changes in the growth rate of exchange rate, respectively. Also, 100% change in the growth rate of the exchange rate and the growth rate of real output cause the growth rate of foreign direct investment to change by 49.8% and 239% respectively. Similarly, 100% change in the growth rate of the exchange rate, the growth rate of foreign direct investment, the growth rate of natural resources, and the growth rate of real output cause the rate of inflation to change by (-7.9%), (-6.3%), (-9.5%) and (-63.4%), respectively. In the same vein, 100% change in the growth rate of exchange rate, the growth rate of foreign direct investment and the rate of inflation will induce (-2.1%), (-3.8%), and 15.1% change in real output growth accordingly. Finally, the natural resource growth changes by (-156%) and 533% in response to 100% change in the growth rate of exchange rate and the rate of inflation. In the exchange rate equation, the growth rate of real output has the highest partial response, followed by the rate of inflation and growth rate of natural resources respectively. For the foreign direct investment equation, the growth rate of real output has the highest partial response followed by the growth rate of the exchange rate. The growth rate of real output has the highest partial response in the rate of inflation equation, followed by the growth rate of natural resources, the growth rate of exchange rate, and the growth rate of foreign direct investment respectively. For the real output equation, the rate of inflation has the highest partial response, followed by the growth rate of foreign direct investment and the growth rate of exchange rate in that order. Lastly, for the growth rate of natural resources equation, the rate of inflation has the highest partial response, followed by the growth rate of the exchange rate.

The Granger Non-causality test was also conducted to determine the direction of causality among the endogenous variables. The conclusions from the results obtained are that there is a bi-directional causality between the growth rate of the exchange rate and the rate of inflation. Also, the rate of inflation and the growth rate of real output predict each other. Similarly, there is a bi-directional causality between the growth rate of exchange rate and the growth rate of natural resources, the rate of inflation and the growth rate of natural resources as well as the growth rate of real output and the growth rate of natural resources. There is a uni-directional causality between the growth rate of the exchange rate and the growth rate of foreign direct investment, the growth rate of real output and the growth rate of foreign direct investment, and lastly, the growth rate of foreign direct investment and the growth rate of natural resources.

From the result of the variance decomposition test, the rate of inflation is the most important variable in controlling the exchange rate fluctuations. For the foreign direct investment, the real output is the most important variable in explaining it's variations. The rate of inflation is also the most important variable in explaining the fluctuations in real output. Most of the variations in the rate of inflation is also explained by the real output. For the natural resources, the exchange rate is the most important variable controlling its fluctuations.

The impulse response functions were also used to trace the effect on current and future values of the endogenous variables to one standard deviation shock in one of the innovations of the endogenous variables in the current period. It was realised that innovations to the endogenous variables generally produce a permanent effect in the system. The results indicate that innovations in the growth rate of FDI, the growth rate of

real output, the rate of inflation and the growth rate of natural resources all have a permanent effect on the growth rate of the exchange rate. Also, innovations in the growth rate of the exchange rate, the growth rate of real output, the rate of inflation and the growth rate of natural resources have permanent effect on the growth rate of foreign direct investment in Ghana. Innovations of the growth rate of exchange rate, the growth rate of foreign direct investment, the rate of inflation and the growth rate of natural resources all leave permanent effect on the growth of real output. The impulse response of the rate of inflation to innovations in the growth rate of FDI, the growth rate of real output, and the growth rate of natural resources also indicates that innovations in these variables have permanent effect on the rate of inflation. However, innovations in the growth rate of the exchange rate has a temporary effect on the rate of inflation. Lastly, the impulse response of the growth rate of natural resources shows that innovations in the growth rate of FDI, the growth rate of real output, and the rate of inflation have a permanent effect on the growth rate of natural resources while the growth rate of the exchange rate has a temporary effect on the growth rate of natural resources.

The introduction of the ERP in 1983 has a positive significant impact on the growth rate of the exchange rate, the growth rate of real output, the growth rate of natural resources and a negative significant impact on the rate of inflation. Political instabilities (change of government), however, has no effect on the growth rate of exchange rate, the growth rate of FDI, the growth rate of real output and the rate of inflation but a negative significant impact on the rate of growth of natural resources. Foreign interest rate has no effect on the growth rate of the exchange rate, the rate of inflation, the growth rate of foreign direct investment and the growth rate of natural resources but a positive significant

impact on the growth rate of real output. The domestic interest rate also has no effect on the growth rate of the exchange rate, the growth rate of real output, the rate of inflation, the growth rate of foreign direct investment as well as the growth rate of natural resources. Foreign debt, however, has a positive significant impact on the growth rate of real output and the rate of inflation and a negative significant impact on the growth rate of foreign direct investment but no effect on the growth rate of the exchange rate. Fiscal deficit has no effect on the growth rate of real output, the growth rate of the exchange rate, the rate of inflation, the growth rate of foreign direct investment as well as the growth rate of natural resources.

6.2 CONCLUSIONS

The main conclusions of the present study are:

First, the growth rate of the exchange rate and the growth rate of real output are the main long run determinants of the growth rate of FDI flow in Ghana. Also, the growth rate of the exchange rate and the rate of inflation are the long run determinants of the growth rate of natural resources.

Secondly, there is bi-directional causality between the rate of inflation and the growth rate of real output, the growth rate of the exchange rate and the growth rate of natural resources, the rate of inflation and the growth rate of natural resources, the growth rate of exchange rate and the rate of inflation as well as the growth rate of real output and the growth rate of natural resources. However, there is a uni-directional causality between the growth rate of the exchange rate and the growth rate of FDI, the growth rate of foreign direct investment and the growth rate of natural resources as well as the growth rate of FDI and the growth rate of real output. But the FDI and the rate of inflation do not

predict each other and also the growth rate of the exchange rate and the growth rate of real output do not Granger-cause each other.

Thirdly, disequilibrium in any one market affects the equilibrium position in the remaining markets in the system.

Fourthly, the result of the variance decomposition test shows that the rate of inflation is the most important variable in controlling the exchange rate fluctuations. For the foreign direct investment, the real output is the most important variable in explaining it's variations. The rate of inflation is also the most important variable in explaining the fluctuations in real output. Most of the variations in the rate of inflation is also explained by the real output. For the natural resources, the exchange rate is the most important variable controlling its fluctuations.

In addition, any unanticipated change in the growth rate of foreign direct investment, the growth rate of real output, the rate of inflation, the growth rate of exchange rate and the growth rate of natural resources all have a permanent effect on the endogenous variables, But the growth rate of the exchange rate has a temporary effect on the growth rate of real output, the rate of inflation, and the growth rate of natural resources but a permanent effect on the growth rate of foreign direct investment.

The Economic Recovery Programme has a significant impact on the endogenous variables and also political instability has an effect on the endogenous variables.

Finally, the findings are also consistent with the literature suggesting that foreign direct investment depends on real output growth and the exchange rate. For example, the studies by Bajurbio and Sosvilla-Rivero (1994), O'Sullivan (1993), Wang and Swain (1995) confirm that FDI is positively related to real output growth while the studies by

O'Sullivan (1993) in Ireland and Wang and Swain (1995) in Hungary also confirm that foreign direct investment is inversely related to the exchange rate. The study by Amartey (1998) on Ghana has established that the growth rate of exchange rate is positively related to the rate of inflation and the growth rate of real output. The growth rate of real output is positively related to the rate of inflation and the growth rate of the exchange rate. Also, the rate of inflation is positively related to the growth rate of the exchange rate and the growth rate of real output. The growth rate of real output and the rate of inflation were also found to drive each other as well as the growth rate of the exchange rate and the rate of inflation. This study extends the work of Amartey by introducing the FDI and natural resource constraints into the dynamic model and it was realised that the growth rate of real output is inversely related to the growth rate of the exchange rate, the growth rate of foreign direct investment and positively related to the rate of inflation. The growth rate of the exchange rate is positively related to the rate of inflation, the growth rate of natural resources and the growth rate of real output. The rate of inflation is also negatively related to the growth rate of the exchange rate, the growth rate of FDI, growth rate of natural resources and the growth rate of real output.

In this work it has been established that the growth rate of FDI is also an important determinant of the growth rate of real output in Ghana. Also, the growth rate of natural resources was found to influence the growth rate of the exchange rate. The growth rate of FDI and the growth rate of natural resources were also found to influence the growth rate of inflation in Ghana. In addition, the growth rate of the exchange rate, the growth rate of real output, the rate of inflation are all driven by the growth rate of natural resources in Ghana. The growth rate of Foreign direct investment is also driven by the

growth rate of the exchange rate and the growth rate of real output.

6.3 POLICY IMPLICATIONS

In order to control inflation in Ghana, the government's policies must be directed towards the regulation of the labour and foreign exchange markets and the exploitation of natural resources. For the labour market, there is the need for the training of technically-skilled manpower to improve productivity in the economy. Increase in the productivity will also improve the purchasing power of the people which will stimulate the inflow of foreign investment to exploit more of the natural resources in Ghana. The exploitation of natural resources will boost the export sector and improve the foreign exchange earnings. The increase in foreign exchange earnings will also increase the demand for the domestic currency which will tend to appreciate the domestic currency and improve the performance of the foreign exchange market. This is supported by the variance decomposition result which shows that the growth rate of real output is the most important variable in controlling the fluctuations in the rate of inflation, followed by the growth rate of the exchange rate and the growth rate of the natural resources.

Secondly, if the government wants to stabilise the exchange rate market from downward plunge (depreciation of domestic currency), then policies must be directed towards controlling domestic inflation rate. Also government can embark upon policies which will enhance the exploitation of the natural resources and boost exports. This will lead to the appreciation of the domestic currency or improve the value of the domestic currency as more foreign exchange is attracted.

Thirdly, for the government to attract more investors, then it should embark upon labour enhancing policies or improve the labour market. Manpower development policies

such as training of more technically-skilled labour will be a step in the right direction. This will help to improve the real income of the people and in turn stimulate more foreign direct investment flow. This is because the labour market drives the investment sector as illustrated by Figure 5.1.

Fourthly, the government can also influence the foreign investment market through the exchange rate market. Therefore, access to foreign exchange by foreign investors is very important. The liberalisation of the foreign exchange market through the establishment of private Forex Bureaux is therefore a good policy change. The authorisation of foreign investors to operate foreign currency account with banks in Ghana under the Free Zones Act, 1995 (Act 504) will also enhance the possibility of foreign investors gaining access to foreign currency and this will stimulate foreign investment into the Free Zones enclave. Also the unconditional transferability through any authorised dealer bank in freely convertible currency of dividends or net profits attributable to the investors, and the remittance of proceeds in the event of sale or liquidation of the enterprise or any interest attributes to the investment as specified under the G.I.P.C Act, 1994 (Act 478) will also boost investor confidence in terms of access to foreign currency.

Also to boost the income level of the people, there is the need for policies that will enhance the exploitation of natural resources. Here, the revision of the investment code and the Mining and Minerals law in Ghana is a step in the right direction. This will attract more investors into the extractive industry for the harnessing of our natural resources. The revision of the Ghana Land Policy and the Land title registration exercise currently going on will also boost the morale of investors and curb the numerous land litigation which scares and frustrate investors in Ghana. This will also eliminate the difficult accessibility

to land for agricultural, industrial, commercial and residential development purposes due to conflicting claims to ownership, and varied outmoded land disposal procedures.

To enhance the exploitation of natural resources, there is the need to stimulate the inflow of FDI, and also improve the income level of the people. Expansionary fiscal policies which will stimulate inflationary expenditures in Ghana will also improve the income level of the people by expanding output and therefore enhance natural resource exploitation.

Lastly, for the government to increase the aggregate supply, then it must concentrate on policies that will fuel the rate of inflation such as expansionary fiscal policies so that producers are more responsive to price changes.

On the issue of foreign direct investment policy in Ghana, the following recommendations are put forward

1. There is the need for more locational incentives to attract foreign investment to the deprive areas, especially the northern sectors of the country. There is also the need for strategic structures and regional/district level incentive packages to encourage investment into the non-attractive regions. To correct this regional imbalance in the distribution of investment projects, it is suggested that the Social Security and National Insurance Trust (SSNIT) must be encouraged to extend the type of industrial parks being developed in the Greater Accra Region to the other regional capitals to help spread investments. Also the rural electrification project undertaken by the government with the help of Danida is a step in the right direct to attract investment to the remote areas of Ghana. The Metropolitan and District Assemblies need to recognize their roles in the district level development under the local government Act by encouraging the establishment of industrial

parks/estates to complement government efforts towards attracting investments to the rural areas in line with Ghana Vision 2020.

2. There is also the need to liberalise the treatment of expatriate staff. Approval process for foreign personnel need to be streamlined and time period for visas and work permits lengthened. A step has to be taken by the government to centralise administration of the approval process by designating one agency to co-ordinate approvals and also to actually centralise the power to make decisions.
3. There is the need to revise the Land Policy in Ghana to reflect current investment trends and also to avoid the number of land litigation pending in courts which tend to scare and frustrate investors in Ghana. In Ghana, land is controlled by communal groups and mechanisms have not been developed to provide secure access to private companies. Also, where land is held privately, lack of clear conveyance and titling mechanisms can impede acquisition by investors. There is the need for policy to convert communal lands to freehold land for foreign investors. The government need to find ways to give foreign firms secure access to agricultural land.
4. On the statistics of registered FDI projects in Ghana, the following recommendations can be made: Registration of businesses as stipulated under the Act continues to increase. Joint-Venture investments or partnerships between Ghanaian and foreign businessmen in projects are on the increase. This is viewed as healthy for the sustenance and strengthening of the Ghanaian private sector especially as foreign-investor confidence continues to build up as evidenced by the establishment of two major banks- Metropolitan Allied Bank Ltd and International Commercial Bank Ltd. The Metropolitan and District Assemblies need to recognize their roles in the district level development under the local government Act

by encouraging the establishment of industrial parks/ estates to complement government efforts towards attracting investments to the rural areas in line with Ghana Vision 2020. There is also the need for strategic structures and regional/district level incentive packages to encourage investment in the non-attractive regions. In addition, there is the need for locational tax incentives for regional investments to encourage and promote investments into the northern regions or areas of sparse investment projects approvals and also to actually centralise the power to make the decisions.

6.4 AREAS OF FURTHER RESEARCH

Future research in Ghana could take several directions.

First, analysing the effects of microeconomic factors and non-policy variables on FDI would complement the findings of this study and provide a more complete view of the determinants of FDI in Ghana. Secondly, future research could look at the effects of FDI on trade balance (i.e. specifically the effects of FDI on exports and imports) or could focus on the analysis of the spill-over effects associated with the presence of FDI in Ghana i.e. the cost—benefit analysis of FDI in Ghana. Also future research can consider the sectorial approach to this study—using disaggregated data—to study the determinants of FDI in Ghana. Finally, research on the impact of FDI on capital formation, employment and productivity growth in Ghana would be valuable.

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APPENDIX A
CUMMULATIVE SECTOR BREAKDOWN AND INVESTMENT COST OF PROJECTS

SECTOR	SEPT 94-SEPT 98				JAN-SEPT 1998				1997				1996				1995			
	TOTAL PROJECTS		INVESTMENT COST		TOTAL PROJECTS		INVESTMENT COST		TOTAL PROJECTS		INVESTMENT COST		TOTAL PROJECTS		INVESTMENT COST		TOTAL PROJECTS		INVESTMENT COST	
		%	US$M	%		%	US$M	%		%	US$M	%		(%)	US$M	%		(%)	US$M	(%)
Manufacturing	198	26.94%	256.37	20.80%	30	21.13%	26.25	18.29%	68	28.69%	100.80	15.83%	57	30.48%	54.30	21.05%	41	27.33%	75.26	40.96%
Service	191	25.99%	695.63	56.43%	34	23.94%	38.98	27.17%	58	24.47%	435.45	68.39%	43	22.99%	145.92	56.58%	49	32.67%	66.65	36.27%
Tourism	82	11.16%	10.79	0.88%	21	14.79%	2.84	1.98%	31	13.08%	4.07	0.64%	14	7.49%	2.01	0.78%	12	8.0%	2.53	1.38%
Build. & Const	61	8.30%	72.32	5.87%	9	6.34%	8.71	6.07%	17	7.17%	9.21	1.45%	20	10.70%	38.71	15.01%	12	8.0%	14.08	7.66%
Export Trade	59	8.03%	7.96	0.65%	7	4.93%	1.99	1.39%	15	6.33%	1.37	0.21%	16	8.56%	1.08	0.42%	21	14.0%	3.15	1.71%
Agriculture	67	9.12%	123.75	10.04%	20	14.08%	36.51	25.45%	15	6.33%	59.82	9.39%	16	8.56%	5.34	2.07%	13	8.67%	20.18	10.98%
General Trade	41	5.58%	49.33	4.00%	12	8.45%	20.73	14.44%	17	7.17%	21.21	3.33%	10	5.35%	6.59	2.56%	2	1.33%	1.90	1.03%
Liaison Office	36	4.90%	16.65	1.35%	9	6.34%	7.48	5.21%	16	6.75%	4.77	0.75%	11	5.88%	3.96	1.54%	0	0.00%	0.00	0.00%
TOTAL	735	100%	1232.8	100%	142	100%	143.49	100%	237	100%	636.70	100%	187	100%	257.91	100%	150	100%	183.75	100%

APPENDIX B
1998 QUARTERLY ANALYSIS OF PROJECTS

	JULY-SEPT 1998				APR-JUN 1998				JAN-MAR 1998			
sector	TOTAL PROJECTS	(%)	INVESTMENT COST (US$)	(%)	TOTAL PROJECTS	(%)	INVESTMENT COST (US$)	(%)	TOTAL PROJECTS	(%)	INVESTMENT COST (US$M)	(%)
Service	7	14%	0.50	2%	15	27%	35.29	67%	12	23%	3.19	6%
Manufacturing	11	22%	2.67	9%	11	20%	13.99	26%	8	15%	9.58	18%
Agriculture	9	18%	5.60	19%	9	16%	0.88	2%	2	4%	30.03	57%
Tourism	7	14%	1.16	4%	7	13%	1.08	2%	7	13%	0.60	1%
General Trade	6	12%	15.63	53%	4	7%	2.27	4%	2	4%	2.63	5%
Liaison office	3	6%	0.93	3%	4	7%	6.04	11%	2	4%	0.51	1%
Export Trade	3	6%	1.56	5%	3	5%	0.27	1%	1	2%	0.16	1%
Building & Const.	4	8%	1.18	4%	2	4%	1.50	3%	3	6%	6.03	11%
TOTAL	50	100%	29.22	100%	55	100%	61.31	100%	37	100%	52.93	100%

APPENDIX C

FINANCING PLAN OF PROJECTS (US$'M)

	Cummulative		JAN-SEPT							
FINANCING PLAN	**SEPT 94-SEPT 98**	**%**	**1998**	**%**	**1997**	**%**	**1996**	**%**	**1995**	**%**
EQUITY										
Local	186.19	15.10%	4.69	3.27%	127.817	20.08%	31.42	12.18%	21.42	11.66%
Foreign	330.74	26.83%	38.09	26.55%	142.25	22.34%	96.40	37.38%	49.07	26.70%
Total Equity	516.93	41.93%	42.78	29.82%	270.06	42.42%	127.82	49.56%	70.49	38.36%
LOAN										
Local	80.79	6.55%	5.21	3.63%	29.27	4.60%	33.70	13.07%	12.06	6.56%
Foreign	635.06	51.51%	95.49	66.55%	337.36	52.99%	96.39	37.37%	101.20	55.07%
Total Loan	715.85	58.07%	100.70	70.18%	366.63	57.58%	130.09	50.44%	113.26	61.64%
GRAND TOTAL	1,232.78	100.0%	143.48	100.0%	636.69	100.0%	257.91	100.0%	183.75	100.0%
FDI INFLOW										
Foreign Equity	330.74	26.83%	38.09	26.55%	142.25	22.34%	96.40	37.38%	49.07	26.70%
Foreign Loan	635.06	51.51%	95.49	66.55%	337.36	52.99%	96.39	37.37%	101.20	55.07%
Total	965	78.34%	133.59	93.10%	479.60	75.33%	192.79	74.75%	150.27	81.78%
LOCAL PARTICIPATION IN INVESTMENT										
Local Equity	186.19	15.10 %	4.69	3.27%	127.82	20.08 %	31.42	12.18%	21.42	11.66%
Local Loan	80.79	6.55%	5.21	3.63%	29.27	4.60%	33.70	13.07%	12.06	6.56%
Total	266.98	21.66 %	9.89	6.90%	157.09	24.67 %	65.12	25.25%	33.48	18.22%

INITIAL CAPITAL TRANSFERS (US$'M)

	Cummulative SEPT 94-SEPT 98		JAN-SEPT 1998		1997		1996		1995		1994 SEPT-DEC	
INITIAL CAPITAL TRANSFERS (ACTUALS)	108.33	100%	15.13	13.97%	67.83	62.61%	11.09	10.24%	11.50	10.62%	2.80	2.58%
MINIMUM EXPECTED TRANSFERS BY LAW	22.60	100%	5.94	26.28%	8.79	38.89%	3.91	17.30%	3.02	13.36%	0.47	2.08%

APPENDIX D
OWNERSHIP STRUCTURE OF PROJECTS AND INVESTMENTS

No. OF PROJECTS/ INVESTMENT COST	SEPT 94-SEPT 98		JAN-SEPT 1998		1997		1996		1995		1994 SEPT-DEC	
	100%F	F/GJV	100%F	F/GJV	100%F	F/GJV	100%F	F/GJV	100%F	F/GJV	100%F	F/GJV
NO. OF PROJECTS	229	506	51	91	82	155	51	136	38	112	7	12
	31.16%	68.84%	35.92%	64.08%	34.60%	65.40%	27.27%	72.73%	25.33%	74.67%	36.84%	63.16%
TOTAL INVESTMENT (US$ MILLION)	243.54	989.25	85.17	58.31	53.98	582.72	60.24	197.67	37.75	146.25	6.39	4.31
	19.76%	80.24%	59.36%	40.64%	8.48%	91.52%	23.36%	76.64	20.52	79.48%	59.72%	40.28%

KEY: F= Foreign, F/GJV= Foreign/Ghanaian Joint Venture

APPENDIX E
EXPECTED EMPLOYMENT CREATION BY PROJECT

SECTOR	Cummulative SEPT 1994-SEPT 1998			JAN-SEPT 1998		1997		1996		1995		1994 SEPT-DEC	
	TOTAL	G	F	G	F	G	F	G	F	G	F	G	F
Manufacturing	15,740	14,953	787	1,326	111	4,339	276	3,639	195	5,609	202	40	3
Service	7,398	6728	670	657	65	2235	152	2196	336	1470	102	170	15
Building & Construction	6745	6349	396	642	33	905	54	3236	161	951	139	615	9
Agriculture	5915	5662	253	1319	113	1269	29	1214	36	1524	34	336	41
Tourism	1701	1548	153	433	40	735	73	290	30	90	10	0	0
General Trade	1608	1489	119	644	40	596	54	119	19	130	6	0	0
Export Trade	1028	914	114	120	16	144	25	283	37	285	30	82	6
Liaison Office	2698	2548	150	1995	67	151	21	170	43	232	19	0	0
TOTAL	42833	40191	2642	7136	485	10374	684	11147	857	10291	542	1243	74
	100%	93.83%	6.17%	93.64%	6.36%	93.81%	6.19	92.86%	7.14%	95%	5%	94.38%	5.62%
				7621	100%	11058	%	12004	100%	10833	100%	1317	100%
							100%						

KEY F= Foreign G= Ghanaian

APPENDIX F
REGIONAL DISTRIBUTION OF PROJECTS BY SECTORS

			S E C T O R S							
REGION	TOTAL	% OF GRAND TOTAL	AGRICULTURE	MANUFACTURING	BUILDING & CONSTRUCTION	TOURISM	SERVICES	EXPORT TRADE	GENERAL TRADE	LIAISON OFFICE
Greater Accra	569	77.41%	31	155	51	54	155	49	35	39
Ashanti	64	8.71%	2	23	4	7	17	6	4	1
Western	37	5.03%	4	10	1	4	10	5	0	3
Central	23	3.13%	8	4	1	8	1	1	0	0
Eastern	21	2.86%	12	3	0	2	2	2	0	0
Volta	10	1.36%	7	0	1	0	1	0	1	0
Northern	7	0.95%	3	0	1	2	1	0	0	0
Brong Ahafo	3	0.41%	0	3	0	0	0	0	0	0
Upper East	1	0.14%	0	0	0	0	1	0	0	0
Upper West	0	0.00%	0	0	0	0	0	0	0	0
TOTAL	735	100.00%	67	198	59	77	188	63	40	43

Source: G.I.P.C; Statistics on registered projects, Third Quarter.1998.

APPENDIX G
IMPLEMENTATION STATUS OF PROJECTS
(SEPT. 1994-JUNE 1998)

1. REGION	2. DISTRIBUTION		3. DISTRIBUTION ON VISIT*	4. VISITED/ CONTACTED (OUT OF 3)	5. IN OPERATION (OUT OF 4)	6. TO START OPERATION (OUT OF 4)	7. CANNOT BE TRACED	8. TO BE VISITED (OUT OF 3)
Greater Accra	530	77.37%	541	431	317	90	24	110
Ashanti	62	9.05%	58	47	33	14	0	11
Western	34	4.96%	36	26	14	12	0	10
Central	23	3.36%	20	13	6	7	0	7
Eastern	18	2.63%	16	13	9	4	0	3
Volta	8	1.17%	5	4	3	1	0	1
Northern	6	0.88%	5	4	3	1	0	1
Brong Ahafo	3	0.44%	3	2	2	0	0	1
Upper East	1	0.15%	1	1	1	0	0	0
Upper West	0	0.00%	0	0	0	0	0	0
TOTAL	685		685	541	388	129	24	144
PERCENTAGE	100%		100%	78.98%	71.72%	23.84%		21.02%

* Distribution on Visit: The disparity between Regional Distribution and ' Distribution on Visit' is due to the relocation of some companies to locations different from those indicated on registration forms. The trend is towards relocation in the Greater Accra Region.

APPENDIX H

REGISTERED PROJECTS CLASSIFIED BY COUNTRY AND ECONOMIC ACTIVITY

SEPT. 4 1994- SEPT. 30, 1998

COUNTRY	TOTAL	AGRICULTURE	BUILDING & CONSTRUCTION	EXPORT TRADE	GENERAL TRADE	LIAISON OFFICE	MANUFAC TURING	SERVICES	TOURISM
1. BRITAIN	80	1	9	3	4	11	20	28	4
2. USA	56	7	4	1	4		11	20	9
3. GERMANY	53	6	3	3		2	16	20	3
4. INDIA	53	9	2	2	10	6	19		5
5. CHINA	51	2	6	1	3	1	12	11	15
6. LEBANON	38	1	2	3	6		16	4	6
7. ITALY	31	1	6	2			16	2	4
8. NETHERLANDS	30	4	2	5	2	2	4	6	5
9. SWITZERLAND	30	3	4		3	3	8	9	
10. KOREA	25	6	1		2	1	8	5	2
11. CANADA	17		3		2		5	6	1
12. FRANCE	15	3			1		6	3	2
13. NIGERIA	15			3	2	2	5	2	1
14. AUSTRALIA	12					2	3	6	1
15. BELGIUM	10	4	1	3			1	1	
16. DENMARK	10	1	1	1		2	1	4	
17. TAIWAN	10	1		1	1		4	2	1
18. MALAYSIA	9					1	1	7	
19. JAPAN	8	1				5		1	1
20. SOUTH AFRICA	8				1	2		5	
21. EGYPT	7	3	1		1				2
22. SPAIN	7	1	3		2		1		
23. SWEDEN	7	1				1	2	3	
24. BRITISH VIRGIN ISLANDS	5	1				1	1	2	
25. HONG KONG	5				2	1	1		1
26. IRELAND	5		1					3	1
27. ISRAEL	5				1		1	3	
28. JAMAICA	4	1	1					1	1
29. SYRIA	4		2		1		1		

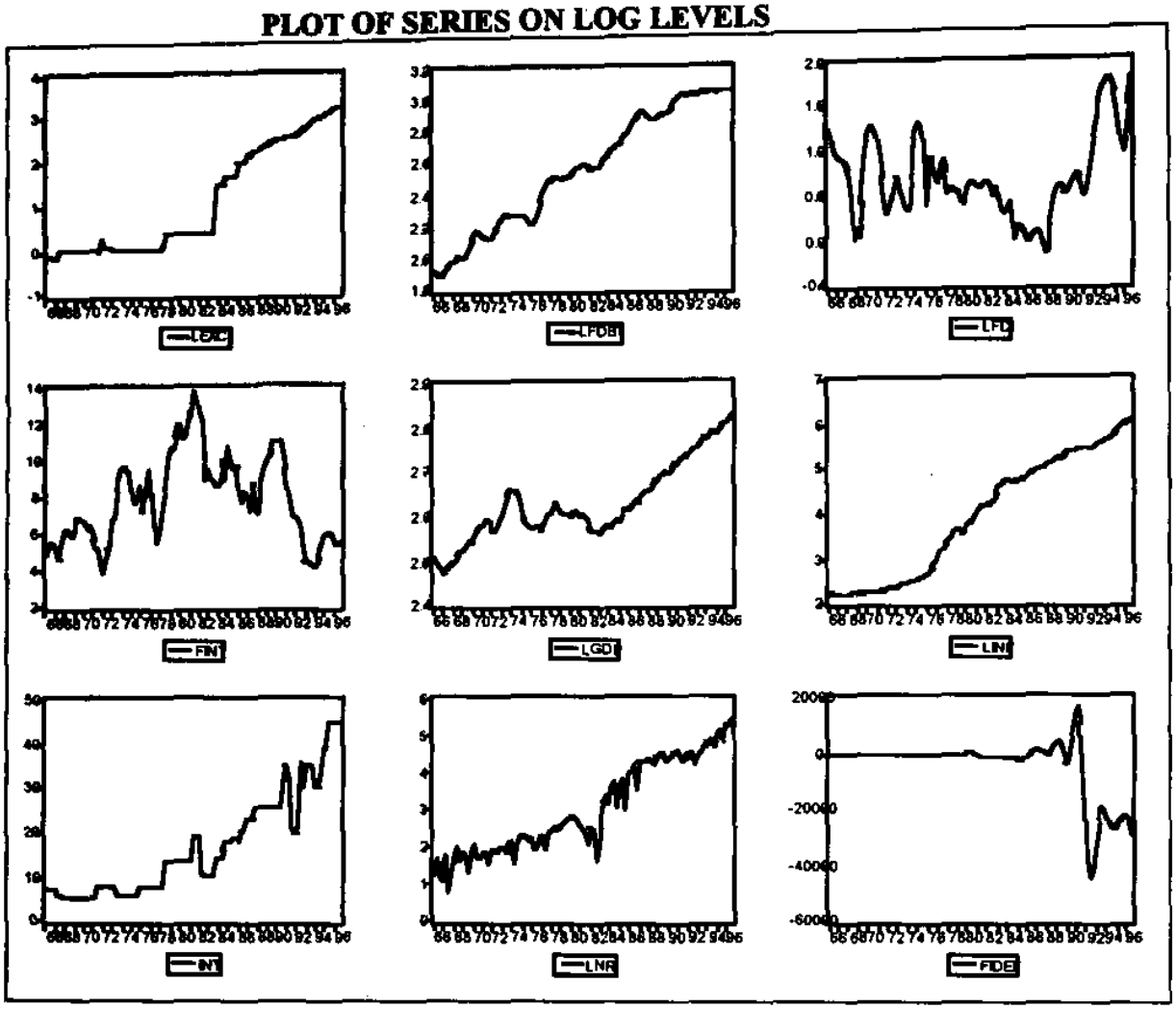
COUNTRY	TOTAL	AGRICULTURE	BUILDING & CONSTRUCTION	EXPORT TRADE	GENERAL TRADE	LIAISON OFFICE	MANUFAC-TURING	SERVICES	TOURISM
61 BENIN	1	1							
62 BANGLADESH/ INDIA	1			1					
63 BELGIUM/CYPRUS	1						1		
64 BOSNIA-HERCEGOVENA	1						1		
65 BRAZIL	1						1		
66 BRITAIN/BELGIUM	1			1					
67 BRITAIN/RUSSIA	1		1						
68 BRITAIN/AUSTRIA	1				1				
69 BRITAIN/ THAILAND	1							1	
70 CAMEROON	1			1					
71 CANADA/GREECE	1		1						
72 CANADA/INDIA	1	1							
73 CHILE	1							1	
74 CHINA/ PHILIPPINES	1						1		
75 COTE D'IVOIRE/ TOGO	1							1	
76 ETHIOPIA	1								1
77 FRANCE/BRITAIN	1				1				
78 FRANCE/ITALY	1						1		
79 FRANCE/SENEGAL	1						1		
80 GERMANY/COTE D'IVOIRE	1							1	
81 GERMANY/ BRITAIN/NETHER-LANDS/SWITZERLAND	1	1							
82 GERMANY/TOGO	1							1	
83 HONG KONG/ CANADA	1						1		
84 HONG KONG/ DENMARK	1				1				

COUNTRY	TOTAL	AGRICULTURE	BUILDING & CONSTRUCTION	EXPORT TRADE	GENERAL TRADE	LIAISON OFFICE	MANUFAC-TURING	SERVICES	TOURISM
61. BENIN	1	1							
62. BANGLADESH/ INDIA	1			1					
63. BELGIUM/CYPRUS	1						1		
64. BOSNIA-HERCEGOVENA	1						1		
65. BRAZIL	1						1		
66. BRITAIN/BELGIUM	1			1					
67. BRITAIN/RUSSIA	1		1						
68. BRITAIN/AUSTRIA	1				1				
69. BRITAIN/ THAILAND	1							1	
70. CAMEROON	1			1					
71. CANADA/GREECE	1		1						
72. CANADA/INDIA	1	1							
73. CHILE	1							1	
74. CHINA/ PHILIPPINES	1						1		
75. COTE D'IVOIRE/ TOGO	1							1	
76. ETHIOPIA	1								1
77. FRANCE/BRITAIN	1				1				
78. FRANCE/ITALY	1						1		
79. FRANCE/SENEGAL	1						1		
80. GERMANY/COTE D'IVOIRE	1							1	
81. GERMANY/ BRITAIN/NETHER-LANDS/SWITZERLAND	1	1							
82. GERMANY/TOGO	1							1	
83. HONG KONG/ CANADA	1						1		
84.HONG KONG/ DENMARK	1				1				

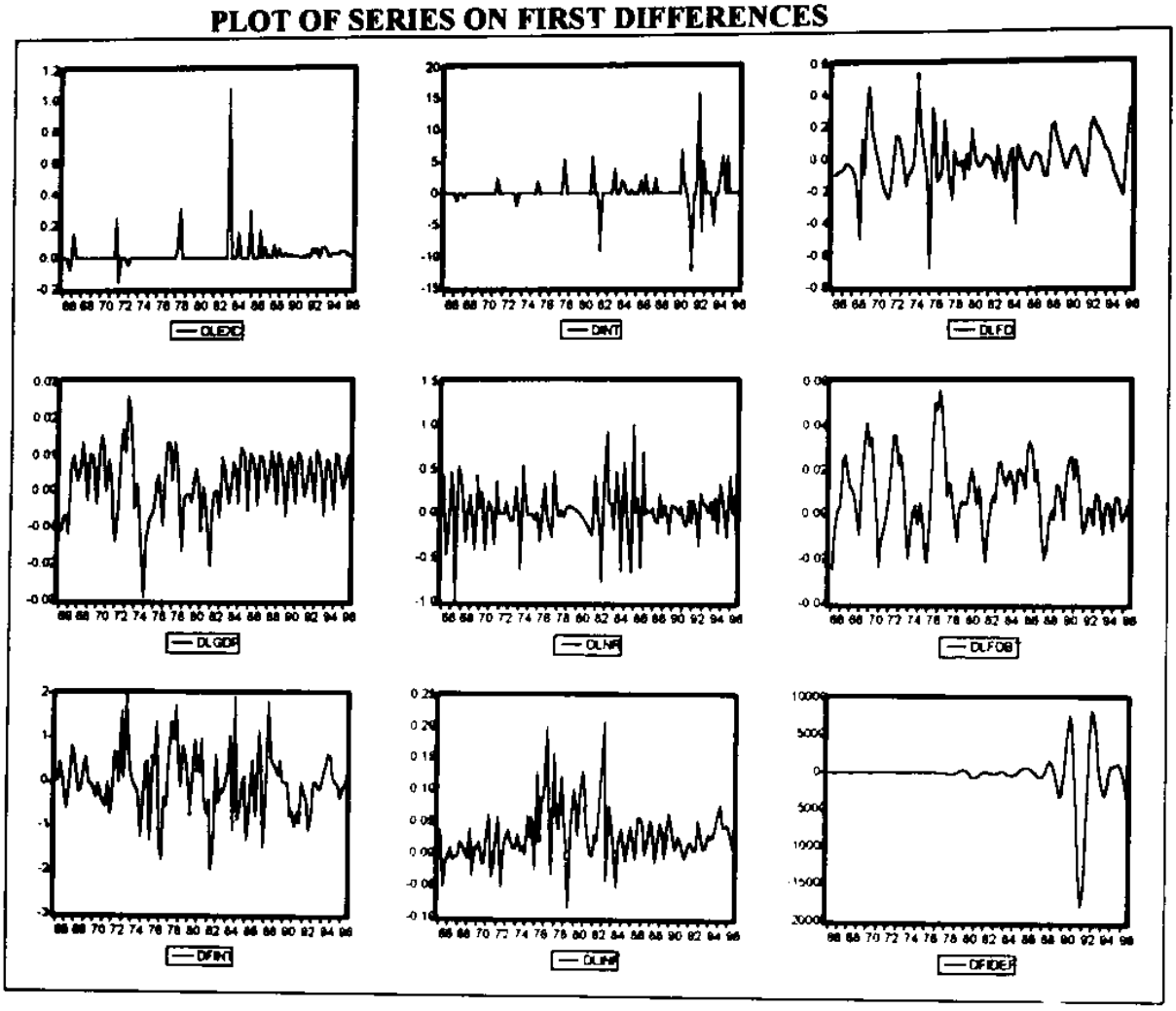
COUNTRY	TOTAL	AGRICULTURE	BUILDING & CONSTRUCTION	EXPORT TRADE	GENERAL TRADE	LIAISON OFFICE	MANUFAC-TURING	SERVICES	TOURISM
85. HONG KONG/ CHINA	1						1		
86. INDIA/BRITAIN	1						1		
87. INDIA/CANADA	1						1		
88. INDONISIA	1						1		
89. INDONISIA/INDIA	1				1				
90. IRAN	1				1				
91. IRELAND/ SWITZERLAND	1						1		
92. ITALY/BRITAIN	1							1	
93 ITALY/COTE D'IVOIRE/ GUINEA	1						1		
94. ITALY/INDIA	1							1	
95. JAMAICA/USA	1	1							
96. KENYA/BRITAIN	1						1		
97. KOREA/HONG KONG	1						1		
98. LEBANON/FRANCE	1						1		
99. LEBANON/BRITAIN	1		1						
100. LEBANON/ NORWAY	1							1	
101. LIBERIA/ SWITZERLAND	1								1
102. LIBYA	1			1					
103. LIBYA/ALGERIA	1		1						
104.LIECHTENSTEIN	1				1				
105. MAURITIUS	1				1				
106. NETHERLANDS/ BRITAIN/CANADA	1							1	
107. NIGER	1				1				
108. NIGERIA/BRITAIN	1			1					
109. NORWAY	1								1
110. PANAMA/TURKEY	1						1		
111. SENEGAL	1			1					
112. SOUTH AFRICA/ TAIWAN	1						1		

COUNTRY	TOTAL	AGRICULTURE	BUILDING & CONSTRUCTION	EXPORT TRADE	GENERAL TRADE	LIAISON OFFICE	MANUFAC-TURING	SERVICES	TOURISM
113. SPAIN/FRANCE	1			1					
114. SPAIN/INDIA	1						1		
115. SUDAN	1	1							
116. TANZANIA	1			1					
117. TUNISIA	1								1
118. UKRAINE/ MADAGASCAR	1		1						
119. USA/BRITAIN/ INDIA	1						1		
120. USA/IRELAND/ NETHERLANDS	1							1	
121. YEMEN/CHINA	1						1		
TOTAL	733	65	60	43	61	45	202	177	80

APPENDIX 1A
PLOT OF SERIES ON LOG LEVELS



APPENDIX 1B
PLOT OF SERIES ON FIRST DIFFERENCES



APPENDIX J

General VEC model for DLEXC

Variable	Coefficient	Std. Error	t-value	t-prob
DLEXC-1	-0.27736	0.11832	-2.344	0.0213
DLEXC-2	-0.30167	0.10238	-2.947	0.0041
DLEXC-3	-0.19508	0.086274	-2.261	0.0262
DLEXC-4	-0.070895	0.089092	-0.796	0.4283
DLFDI-1	0.022495	0.060625	0.371	0.7115
DLFDI-2	-0.090077	0.063973	-1.408	0.1626
DLFDI-3	0.046442	0.066337	0.700	0.4857
DLFDI-4	-0.036210	0.067207	-0.539	0.5914
DLGDP-1	-2.2941	1.5438	-1.486	0.1408
DLGDP-2	0.90982	1.6268	0.559	0.5774
DLGDP-3	2.6008	1.5959	1.630	0.1067
DLGDP-4	-1.4787	1.4773	-1.001	0.3195
DLINF-1	-0.63781	0.25191	-2.532	0.0131
DLINF-2	1.2120	0.25799	4.698	0.0000
DLINF-3	0.19227	0.26223	0.733	0.4653
DLINF-4	0.36372	0.27256	1.334	0.1854
DLNR-1	0.053361	0.083943	0.636	0.5266
DLNR-2	0.18046	0.069928	2.581	0.0115
DLNR-3	0.14454	0.054434	2.655	0.0094
DLNR-4	0.072282	0.043862	1.648	0.1029
CONSTANT	1.0102	0.52083	1.940	0.0556
PIDD	-0.0090187	0.024109	-0.374	0.7092
ERPDD	0.16388	0.047613	3.442	0.0009
ET2-1	-0.013474	0.091297	-0.148	0.8830
ET1-1	0.060330	0.061406	0.982	0.3285
DFIDEF	-1.5298e-007	2.7814e-006	-0.055	0.9563
DLFDBT	-0.30754	0.70793	-0.434	0.6650
DFINT	0.006824	0.013005	0.468	0.6411
DINT	0.0033798	0.0034015	0.994	0.3231

APPENDIX K

General VEC model for DLFDI

Variable	Coefficient	Std.Error	t-value	t-prob
DLEXC_1	-0.030399	0.19185	-0.158	0.8745
DLEXC_2	-0.12625	0.16600	-0.761	0.4489
DLEXC_3	0.060701	0.13989	-0.434	0.6654
DLEXC-4	-0.34902	0.14446	-2.416	0.0177
DLFDI_1	0.34470	0.0983301	3.507	0.0007
DLFDI_2	0.032433	0.10373	0.313	0.7553
DLFDI_3	-0.039642	0.10756	-0.369	0.7133
DLFDI-4	-0.11279	0.10897	-1.035	0.3034
DLGDP_1	-0.72652	2.5032	-0.290	0.7723
DLGDP_2	4.5273	2.6877	-1.776	0.0882
DLGDP_3	-1.2329	2.5877	-0.476	0.6349
DLGDP_4	3.0362	2.3954	1.268	0.2082
DLNR_1	-0.094876	0.13611	-0.697	0.4876
DLNR_2	0.016062	0.11338	0.142	0.8877
DLNR_3	0.054656	0.088262	0.619	0.5373
DLNR-4	0.052428	0.071121	0.737	0.4629
DLINF-1	-0.28246	0.40847	-0.692	0.4910
DLINF_2	-0.094345	0.41831	-0.226	0.8221
DLINF_3	-0.27231	0.42519	-0.640	0.5235
DLINF_4	0.29900	0.44194	0.677	0.5004
CONSTANT	-1.7105	0.84450	-2.025	0.0458
DFIDEF	2.7546e-006	4.5098e-006	0.611	0.5429
DLFDBT	-1.9094	1.1479	-1.663	0.0997
DFINT	0.026756	0.021088	1.269	0.2078
DINT	0.0033785	0.0055154	0.613	0.5417
ERPDD	0.071627	0.077202	0.928	0.3560
PIDD	0.0055204	0.039092	0.141	0.8880
ET1_1	-0.17324	0.099567	-1.740	0.0853
ET2_1	-0.17091	0.14803	-1.155	0.2513

APPENDIX L

General VEC model for DLGDP

Variable	Coefficient	Std.Error	t-value	t-prob
DLEXC_1	0.0036914	0.0074658	0.494	0.6222
DLEXC_2	-0.0094282	0.0064598	-1.460	0.1479
DLEXC_3	0.0018634	0.0054438	0.342	0.7329
DLEXC_4	-0.00017546	0.0056216	-0.031	0.9752
DLFDI_1	-0.0014091	0.0038254	-0.368	0.7135
DLFDI_2	-0.010738	.0040366	-2.660	0.0092
DLFDI_3	0.0073445	0.0041857	1.755	0.0827
DLFDI_4	0.0037374	0.0042406	0.881	0.3805
DLGDP_1	0.53503	0.097413	5.492	0.0000
DLGDP_2	-0.079735	0.10265	-0.777	0.4393
DLGDP_3	0.0018621	0.10070	0.018	0.9853
DLGDP_4	0.19072	0.093216	2.046	0.0437
DLNR_1	0.0022505	0.0055031	0.409	0.6836
DLNR_2	-0.00059849	0.0045984	-0.130	0.8967
DLNR_3	-0.00047838	0.0035907	-0.133	0.8943
DLNR_4	-7.2987e-005	0.0028603	0.026	0.9797
DLINF_1	-0.0071225	0.0155895	-0.448	0.6552
DLINF_2	0.0042330	0.016279	0.260	0.7954
DLINF_3	-0.069413	0.016546	-4.195	0.0001
DLINF_4	0.019368	0.017198	1.126	0.2631
CONSTANT	0.032037	0.032864	0.975	0.3323
DFIDEF	1.1210e-007	1.7550e-007	0.639	0.5246
DLFDBT	0.21534	0.044669	4.821	0.0000
DFINT	0.011578	0.00082063	1.411	0.1617
DINT	-0.00018380	0.00021463	-0.856	0.3941
ERPDD	0.0040064	0.0030043	1.334	0.1857
PIDD	-0.00060859	0.0015212	-0.400	0.6901
ET1_1	0.0045935	0.0038747	1.186	0.2389
ET2_1	0.0067676	0.0057607	1.175	0.2432

APPENDIX M

General VEC model for DLINF

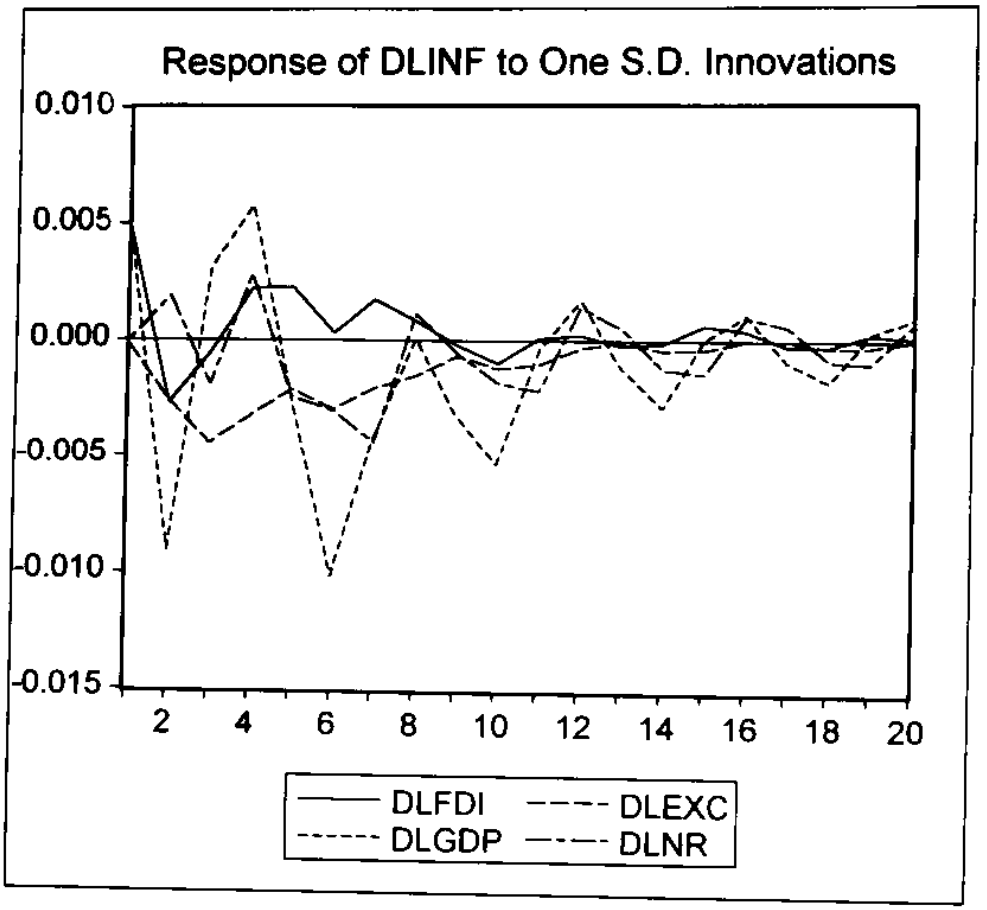
Variable	Coefficient	Std.Error	t-value	t-prob
DLEXC_1	-0.00052553	0.048444	-0.011	0.9914
DLEXC_2	-0.00087812	0.041917	-0.021	0.9833
DLEXC_3	-0.090466	0.035324	-2.561	0.0121
DLEXC_4	-0.024569	0.036478	-0.674	0.5023
DLFDI_1	-0.058735	0.024822	-2.366	0.0201
DLFDI_2	-0.00096682	0.026193	-0.037	0.9706
DLFDI_3	-0.016900	0.027161	-0.622	0.5354
DLFDI_4	0.015742	0.027517	0.572	0.5687
DLGDP_1	-2.2734	0.63209	-3.597	0.0005
DLGDP_2	2.2601	0.66607	3.393	0.0010
DLGDP_3	0.47764	0.65343	0.731	0.4667
DLGDP_4	-1.0147	0.60486	-1.678	0.0969
DLNR_1	-0.077342	0.034369	-2.250	0.0269
DLNR_2	-0.054178	0.028631	-1.892	0.0617
DLNR_3	-0.017067	0.022287	-0.766	0.4458
DLNR_4	0.0076531	0.017959	0.426	0.6710
DLINF_1	-0.0045107	0.10314	-0.044	0.9652
DLINF_2	-0.10252	0.10563	-0.971	0.3344
DLINF_3	0.083251	0.10737	0.775	0.4401
DLINF_4	-0.018877	0.11160	-0.169	0.8661
CONSTANT	0.24735	0.21325	1.160	0.2491
DFIDEF	8.4796e-007	1.1388e-006	0.745	0.4584
DLFDBT	0.98161	0.28985	3.387	0.0011
DFINT	0.0061388	0.0053249	1.153	0.2520
DINT	0.00071486	0.0013927	0.513	0.6090
ERPDD	-0.010043	0.019494	-0.515	0.6077
PIDD	0.0023093	0.0098711	0.234	0.8156
ET1_1	0.055833	0.625142	1.221	0.6289
ET2_1	0.10937	0.037380	2.926	0.0043

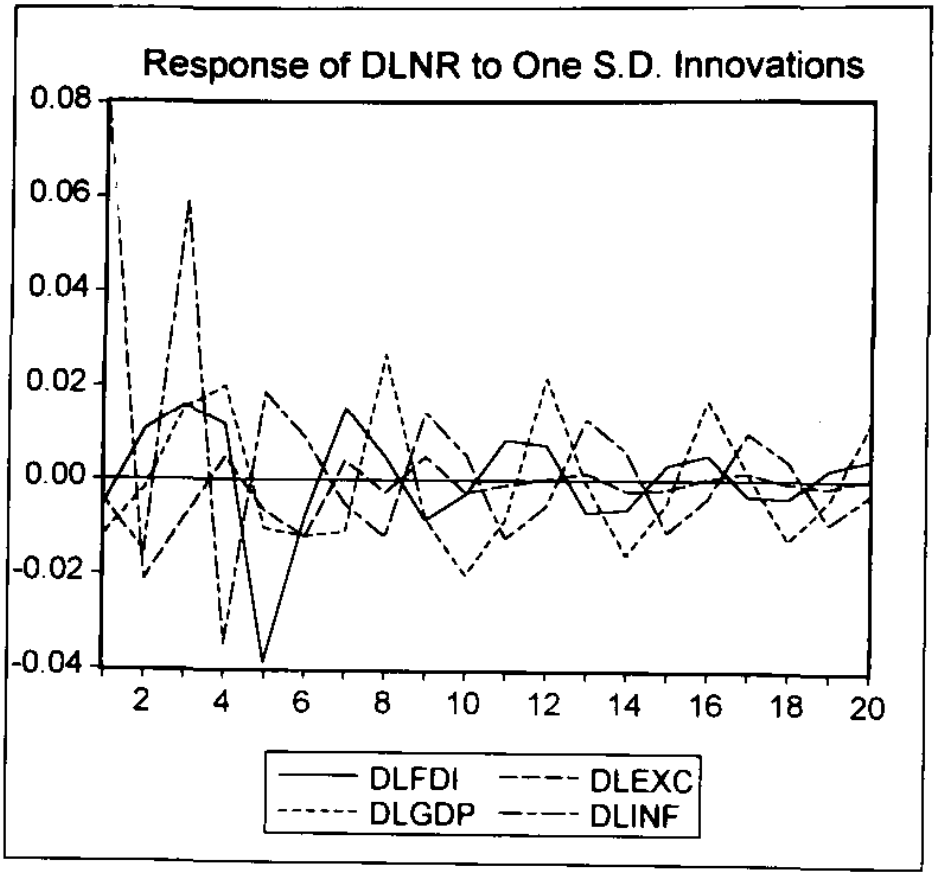
APPENDIX N

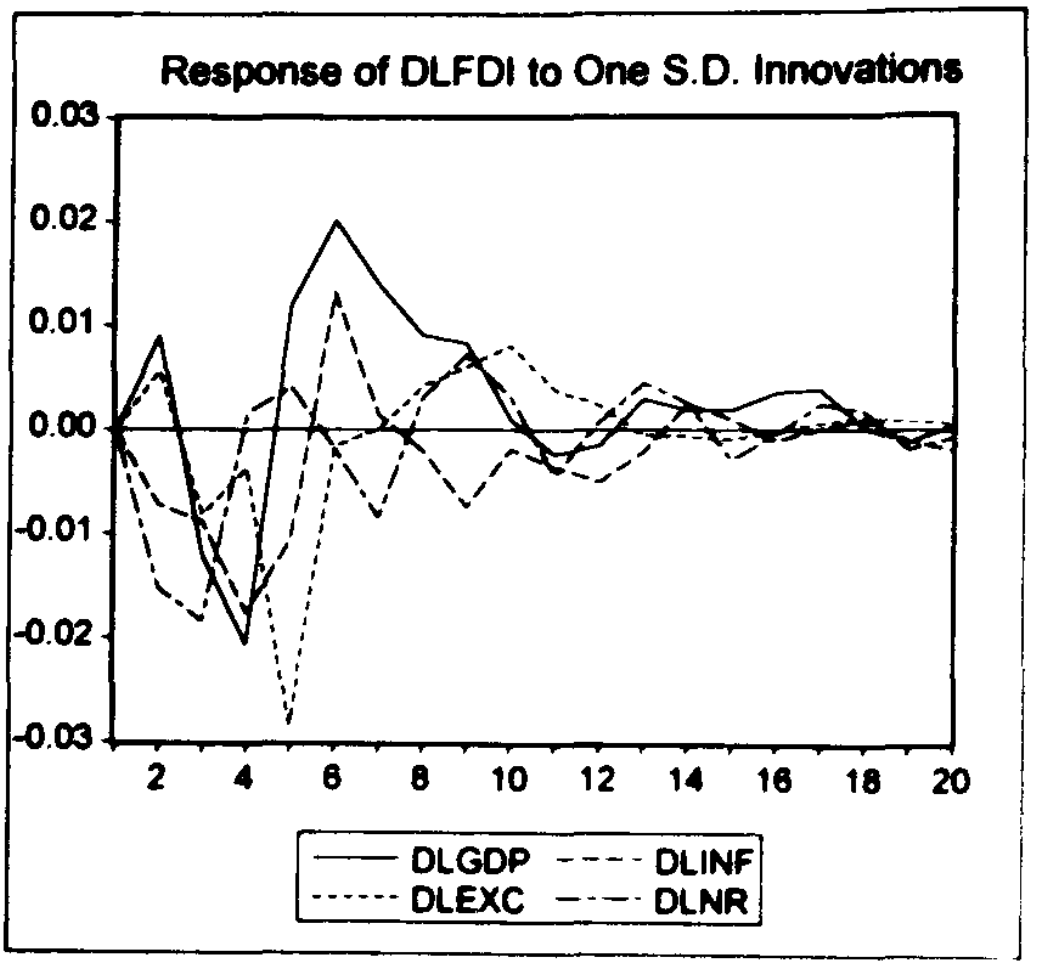
General VEC model for DLNR

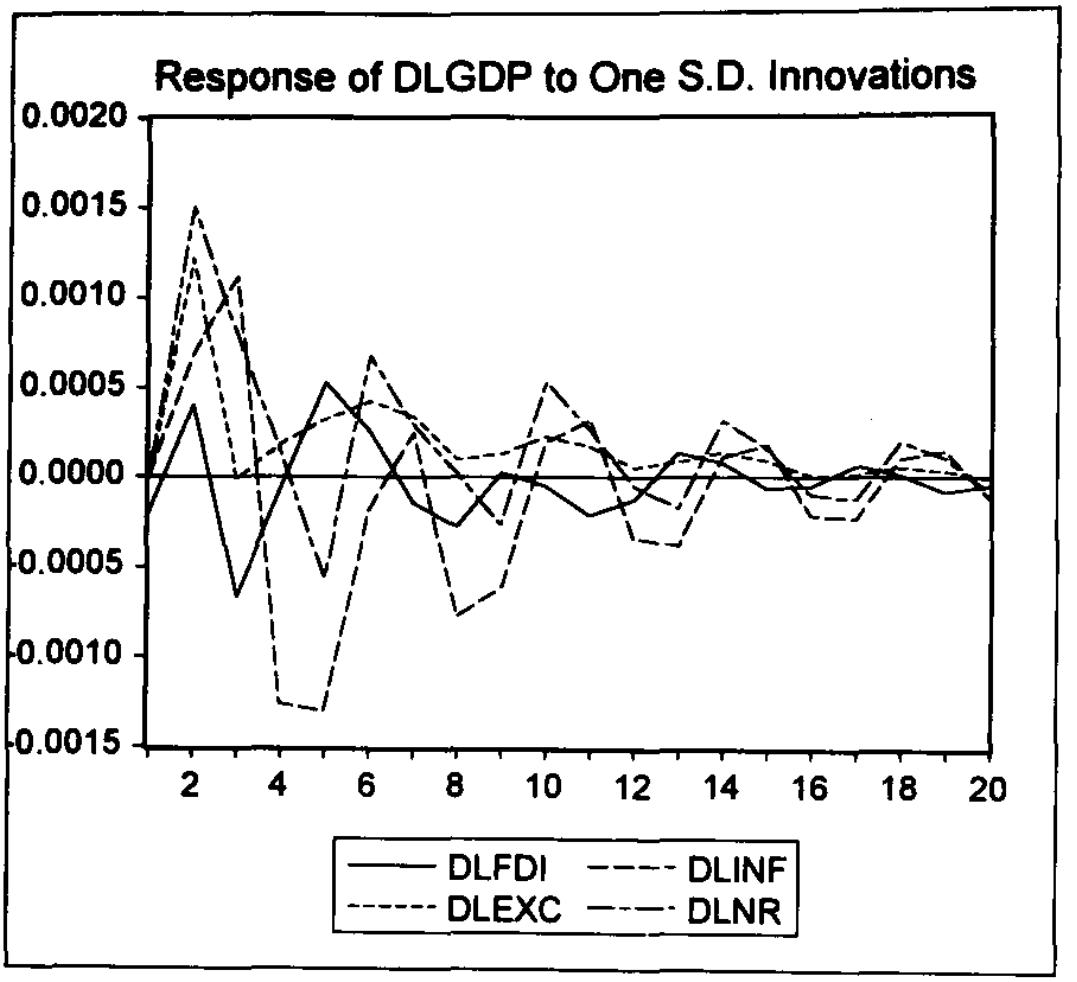
Variable	Coefficient	Std.Error	t-value	t-prob
DLEXC_1	-0.60385	0.28048	-2.153	0.0340
DLEXC_2	-0.41468	0.24268	-1.709	0.0909
DLEXC_3	-0.017476	0.20451	-0.085	0.9321
DLEXC_4	-0.45394	0.21119	-2.149	0.0343
DLFDI_1	0.18620	0.14371	1.296	0.1984
DLFDI_2	0.12761	0.15165	0.841	0.4023
DLFDI_3	0.34662	0.15725	2.204	0.0301
DLFDI_4	-0.10844	0.15931	-0.681	0.4978
DLGDP_1	-5.0895	3.6596	-1.391	0.1677
DLGDP_2	-2.7331	3.8563	-0.709	0.4803
DLGDP_3	4.1473	3.7831	1.096	0.2759
DLGDP_4	-7.9892	3.5019	-2.281	0.0249
DLNR_1	0.20056	0.19899	1.008	0.3162
DLNR_2	0.087897	0.16576	0.530	0.5972
DLNR_3	-0.043264	0.12904	-0.335	0.7382
DLNR_4	0.27006	0.10398	2.597	0.0110
DLINF_1	0.39815	0.59716	0.667	0.5066
DLINF_2	2.6893	0.61156	4.398	0.0000
DLINF_3	0.56247	0.62161	0.905	0.3680
DLINF_4	1.7855	0.64610	2.763	0.0069
CONSTANT	0.63019	1.2346	-0.510	0.6110
DFIDEF	-3.2510e-006	6.5932e-006	-0.493	0.6232
DLFDBT	-0.46782	1.6781	-0.279	0.7811
DFINT	0.046723	0.030829	1.516	0.1331
DINT	0.0051691	0.0080633	0.641	0.5231
ERPDD	0.27740	0.057150	-2.519	0.0135
PIDD	-0.14395	0.05715	-2.519	0.0135
ET1_1	-0.40227	0.74556	-1.764	0.7269
ET2_1	-0.95313	0.21642	-4.404	0.0000

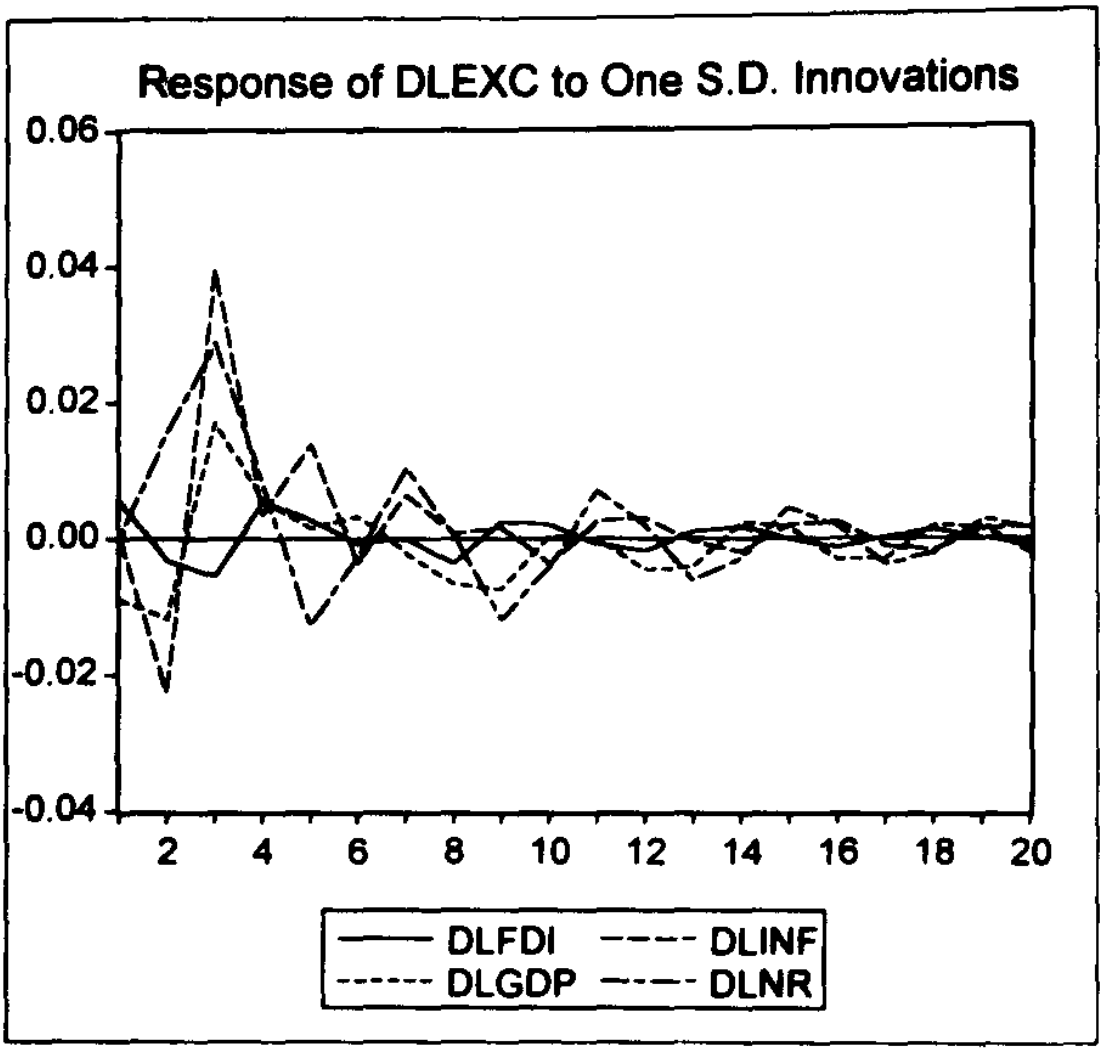
APPENDIX O


Response of DLINF to One S.D. Innovations
0.010
0.005
0.000
-0.005
-0.010
-0.015
2
4
6
8
10
12
14
16
18
20
DLFDI
DLEXC
DLGDP
DLNR


Response of DLNR to One S.D. Innovations
0.08
0.06
0.04
0.02
0.00
-0.02
-0.04
2
4
6
8
10
12
14
16
18
20
DLFDI
DLEXC
DLGDP
DLINF


Response of DLFDI to One S.D. Innovations
0.03
0.02
0.01
0.00
-0.01
-0.02
-0.03
2
4
6
8
10
12
14
16
18
20
DLGDP
DLINF
DLEXC
DLNR


Response of DLGDP to One S.D. Innovations
0.0020
0.0015
0.0010
0.0005
0.0000
-0.0005
-0.0010
-0.0015
2
4
6
8
10
12
14
16
18
20
DLFDI
DLINF
DLEXC
DLNR


Response of DLEXC to One S.D. Innovations
0.06
0.04
0.02
0.00
-0.02
-0.04
2
4
6
8
10
12
14
16
18
20
DLFDI
DLINF
DLGDP
DLNR

APPENDIX P: THE DATA SET

obs	EXC	FDI	GDP	INF	NR
1966:1	0.850000	18.45000	323.0000	169.3000	18.86000
1966:2	0.850000	14.90000	315.0000	184.9000	52.96000
1966:3	0.850000	12.31000	310.0000	164.7000	18.46000
1966:4	0.710000	10.44000	305.0000	161.9000	12.54000
1967:1	0.710000	9.040000	297.0000	161.0000	36.94000
1967:2	1.020000	8.370000	301.0000	165.2000	63.83000
1967:3	1.020000	7.890000	308.0000	162.5000	6.640000
1967:4	1.020000	7.300000	312.0000	162.0000	23.25000
1968:1	1.020000	6.400000	314.0000	161.0000	62.87000
1968:2	1.020000	5.120000	319.0000	169.2000	99.00000
1968:3	1.020000	3.240000	329.0000	175.0000	46.78000
1968:4	1.020000	1.040000	334.0000	176.8000	47.15000
1969:1	1.020000	1.400000	332.0000	174.6000	76.15000
1969:2	1.020000	1.140000	340.0000	191.7000	58.57000
1969:3	1.020000	2.770000	348.0000	178.0000	23.17000
1969:4	1.020000	7.970000	353.0000	182.5000	62.95000
1970:1	1.020000	13.34000	350.0000	186.2000	73.53000
1970:2	1.020000	17.77000	360.0000	194.9000	126.7500
1970:3	1.020000	19.32000	373.0000	188.4000	49.83000
1970:4	1.020000	17.38000	382.0000	183.8000	50.29000
1971:1	1.020000	13.19000	382.0000	194.7000	69.77000
1971:2	1.020000	8.950000	390.0000	225.6000	77.09000
1971:3	1.020000	5.370000	392.0000	208.3000	34.81000
1971:4	1.820000	3.090000	384.0000	203.8000	80.98000
1972:1	1.280000	2.080000	372.0000	219.4000	81.48000
1972:2	1.280000	2.130000	368.0000	252.1000	82.50000
1972:3	1.280000	3.030000	377.0000	224.0000	80.60000
1972:4	1.280000	4.260000	392.0000	229.6000	111.9700
1973:1	1.150000	5.070000	402.0000	243.9000	114.0800
1973:2	1.150000	5.070000	427.0000	267.1000	93.59000
1973:3	1.150000	3.490000	449.0000	281.6000	77.74000
1973:4	1.150000	2.770000	460.0000	287.8000	154.5200
1974:1	1.150000	2.320000	455.0000	295.7000	151.1900
1974:2	1.150000	2.160000	457.0000	319.5000	35.10000
1974:3	1.150000	2.870000	451.0000	324.2000	125.6200
1974:4	1.150000	10.11000	434.0000	334.1100	209.6500
1975:1	1.150000	17.05000	406.0000	334.2000	200.0000
1975:2	1.150000	21.44000	394.0000	385.7000	197.5000
1975:3	1.150000	19.98000	386.0000	412.5000	195.6000
1975:4	1.150000	12.44000	380.0000	474.2000	164.8200
1976:1	1.150000	2.620000	375.0000	449.6000	168.9400
1976:2	1.150000	5.540000	376.0000	606.8000	83.09000
1976:3	1.150000	8.860000	380.0000	635.4000	98.69000
1976:4	1.150000	6.520000	380.0000	783.3000	216.6000
1977:1	1.150000	5.130000	372.0000	964.5000	224.3400
1977:2	1.150000	4.420000	379.0000	1534.600	153.6800
1977:3	1.150000	7.840000	391.0000	1729.200	85.07000
1977:4	1.150000	8.070000	403.0000	1613.600	267.7000

APPENDIX P: THE DATA SET

obs	EXC	FDI	GDP	INF	NR
1978:1	1.150000	6.080000	406.0000	2326.810	317.3000
1978:2	1.350000	3.430000	419.0000	2706.010	300.4000
1978:3	2.780000	3.940000	427.0000	2960.960	327.5000
1978:4	2.780000	3.750000	424.0000	3925.890	300.1400
1979:1	2.780000	3.520000	408.0000	4558.420	345.7400
1979:2	2.780000	3.490000	406.0000	4595.530	415.0700
1979:3	2.780000	2.640000	405.0000	3790.350	500.1500
1979:4	2.780000	2.840000	404.0000	4203.430	585.0500
1980:1	2.780000	2.470000	401.0000	5323.270	646.3500
1980:2	2.780000	3.840000	403.0000	6459.240	677.4100
1980:3	2.780000	4.630000	409.0000	6911.050	660.4800
1980:4	2.780000	4.660000	411.0000	8723.120	579.7600
1981:1	2.780000	4.230000	401.0000	11837.37	454.1200
1981:2	2.780000	3.930000	402.0000	14094.80	331.5400
1981:3	2.780000	3.920000	400.0000	15421.18	212.1800
1981:4	2.780000	4.210000	391.0000	15498.63	120.1600
1982:1	2.780000	4.450000	373.0000	15416.33	337.7000
1982:2	2.780000	4.570000	369.0000	16587.81	386.8000
1982:3	2.780000	4.150000	369.0000	17441.40	281.3000
1982:4	2.780000	3.130000	369.0000	20397.52	47.40000
1983:1	2.780000	3.850000	363.0000	28137.96	152.9000
1983:2	2.780000	3.740000	371.0000	45474.48	1326.740
1983:3	2.780000	3.020000	377.0000	41469.52	1814.560
1983:4	33.33000	2.210000	379.0000	49447.16	2303.090
1984:1	33.33000	2.060000	376.0000	55828.95	1477.000
1984:2	33.33000	2.290000	378.0000	56334.00	4456.000
1984:3	33.33000	2.700000	385.0000	50126.48	5579.000
1984:4	50.00000	1.070000	390.0000	52408.11	1283.000
1985:1	50.00000	1.310000	387.0000	57700.72	5041.000
1985:2	50.00000	1.470000	398.0000	60155.01	7750.000
1985:3	50.00000	1.480000	408.0000	58867.36	4564.000
1985:4	50.00000	1.340000	414.0000	62627.04	969.0000
1986:1	100.0000	1.140000	409.0000	69409.00	10315.00
1986:2	100.0000	1.010000	419.0000	74078.76	10869.00
1986:3	100.0000	1.020000	428.0000	72899.22	16167.00
1986:4	100.0000	1.130000	433.0000	83503.80	3924.000
1987:1	149.9300	1.240000	429.0000	95431.53	19991.00
1987:2	149.4300	1.310000	439.0000	106578.3	19516.67
1987:3	175.4400	1.200000	449.0000	106365.3	21363.96
1987:4	176.0600	0.940000	455.0000	112045.2	22183.33
1988:1	185.1900	0.740000	455.0000	127075.8	25466.00
1988:2	188.6800	0.790000	461.0000	142125.9	22027.00
1988:3	227.2700	1.290000	473.0000	138309.7	17219.00
1988:4	229.8900	2.180000	481.0000	141799.9	28835.00
1989:1	261.7800	3.080000	477.0000	158600.7	26955.00
1989:2	270.2700	3.850000	489.0000	174480.2	33402.00
1989:3	281.6900	4.150000	498.0000	172061.4	32353.00
1989:4	303.0300	3.920000	502.0000	184989.6	19506.00
1990:1	311.5300	3.450000	494.0000	215806.1	24448.00

APPENDIX P: THE DATA SET

obs	EXC	FDI	GDP	INF	NR
1990:2	328.9500	3.290000	503.0000	238022.1	29526.00
1990:3	337.8400	3.640000	514.0000	243224.4	33526.00
1990:4	350.0100	4.420000	522.0000	251403.7	33278.00
1991:1	361.0100	5.120000	518.0000	269501.9	40246.00
1991:2	366.3000	5.560000	531.0000	279198.0	31414.00
1991:3	375.9400	5.190000	543.0000	275383.4	22513.00
1991:4	383.0000	4.120000	547.0000	277195.5	32473.00
1992:1	406.5000	3.220000	545.0000	289244.2	26401.00
1992:2	414.9400	3.450000	549.0000	302571.0	37176.00
1992:3	480.7700	5.660000	561.0000	306997.1	38000.00
1992:4	520.2000	10.17000	568.0000	314151.8	16637.00
1993:1	602.4100	16.46000	564.0000	356552.3	28649.00
1993:2	602.4100	25.21000	579.0000	381372.8	36955.00
1993:3	699.3000	36.05000	592.0000	389542.4	47067.00
1993:4	819.6700	47.28000	598.0000	401032.8	49156.00
1994:1	934.5800	55.48000	589.0000	433332.3	67932.00
1994:2	943.4000	61.47000	601.0000	461045.9	58476.00
1994:3	980.3900	61.47000	613.0000	491207.3	87044.00
1994:4	1052.630	54.58000	619.0000	538098.5	52423.00
1995:1	1111.110	42.87000	612.0000	622226.8	113268.0
1995:2	1176.470	31.29000	627.0000	746225.5	148804.0
1995:3	1298.700	20.22000	641.0000	834081.1	129787.0
1995:4	1449.200	12.12000	649.0000	919174.3	69434.00
1996:1	1587.300	9.750000	650.0000	1025328.	188425.0
1996:2	1666.670	15.60000	657.0000	1107561.	195019.0
1996:3	1724.140	32.38000	672.0000	1138637.	305988.0
1996:4	1754.390	62.28000	678.0000	1219398.	101694.0

APPENDIX P: THE DATA SET

obs	EXC	FDI	GDP	INF	NR
1990:2	328.9500	3.290000	503.0000	238022.1	29526.00
1990:3	337.8400	3.640000	514.0000	243224.4	33526.00
1990:4	350.0100	4.420000	522.0000	251403.7	33278.00
1991:1	361.0100	5.120000	518.0000	269501.9	40246.00
1991:2	366.3000	5.560000	531.0000	279198.0	31414.00
1991:3	375.9400	5.190000	543.0000	275383.4	22513.00
1991:4	383.0000	4.120000	547.0000	277195.5	32473.00
1992:1	406.5000	3.220000	545.0000	289244.2	26401.00
1992:2	414.9400	3.450000	549.0000	302571.0	37176.00
1992:3	480.7700	5.660000	561.0000	306997.1	38000.00
1992:4	520.2000	10.17000	568.0000	314151.8	16637.00
1993:1	602.4100	16.46000	564.0000	356552.3	28649.00
1993:2	602.4100	25.21000	579.0000	381372.8	36955.00
1993:3	699.3000	36.05000	592.0000	389542.4	47067.00
1993:4	819.6700	47.28000	598.0000	401032.8	49156.00
1994:1	934.5800	55.48000	589.0000	433332.3	67932.00
1994:2	943.4000	61.47000	601.0000	461045.9	58476.00
1994:3	980.3900	61.47000	613.0000	491207.3	87044.00
1994:4	1052.630	54.58000	619.0000	538098.5	52423.00
1995:1	1111.110	42.87000	612.0000	622226.8	113268.0
1995:2	1176.470	31.29000	627.0000	746225.5	148804.0
1995:3	1298.700	20.22000	641.0000	834081.1	129787.0
1995:4	1449.200	12.12000	649.0000	919174.3	69434.00
1996:1	1587.300	9.750000	650.0000	1025328.	188425.0
1996:2	1666.670	15.60000	657.0000	1107561.	195019.0
1996:3	1724.140	32.38000	672.0000	1138637.	305988.0
1996:4	1754.390	62.28000	678.0000	1219398.	101694.0

APPENDIX P: THE DATA SET

obs	FINT	INT	FDBT	FIDEF	ERPDD
1966:1	5.030000	7.000000	85.50000	-22.18000	0.000000
1966:2	5.080000	7.000000	80.83000	-18.96000	0.000000
1966:3	5.540000	7.000000	79.35000	-17.67000	0.000000
1966:4	5.560000	7.000000	79.72000	-17.78000	0.000000
1967:1	5.250000	7.000000	80.33000	-18.63000	0.000000
1967:2	4.650000	6.000000	84.93000	-20.79000	0.000000
1967:3	4.720000	6.000000	90.35000	-23.28000	0.000000
1967:4	5.540000	6.000000	94.89000	-25.40000	0.000000
1968:1	6.200000	5.500000	97.69000	-26.60000	0.000000
1968:2	6.330000	5.500000	100.2000	-27.05000	0.000000
1968:3	6.100000	5.500000	101.9800	-26.35000	0.000000
1968:4	5.960000	5.500000	101.4300	-23.99000	0.000000
1969:1	6.350000	5.500000	99.36000	-20.45000	0.000000
1969:2	6.920000	5.500000	103.2300	-17.52000	0.000000
1969:3	6.910000	5.500000	111.6800	-14.98000	0.000000
1969:4	6.860000	5.500000	122.9800	-13.05000	0.000000
1970:1	6.770000	5.500000	132.1100	-11.74000	0.000000
1970:2	6.440000	5.500000	143.1300	-11.67000	0.000000
1970:3	6.410000	5.500000	149.0800	-12.47000	0.000000
1970:4	6.160000	5.500000	147.6900	-14.02000	0.000000
1971:1	5.750000	5.500000	139.8800	-16.09000	0.000000
1971:2	5.210000	5.500000	136.1500	-19.52000	0.000000
1971:3	5.200000	8.000000	134.1000	-23.94000	0.000000
1971:4	4.490000	8.000000	133.8700	-28.85000	0.000000
1972:1	3.930000	8.000000	135.7300	-33.59000	0.000000
1972:2	4.600000	8.000000	142.6900	-38.39000	0.000000
1972:3	5.230000	8.000000	155.1100	-43.02000	0.000000
1972:4	5.230000	8.000000	168.4800	-46.20000	0.000000
1973:1	6.820000	8.000000	177.4800	-47.02000	0.000000
1973:2	6.930000	8.000000	189.1500	-47.87000	0.000000
1973:3	8.870000	6.000000	195.4300	-47.02000	0.000000
1973:4	9.560000	6.000000	193.9300	-44.69000	0.000000
1974:1	9.750000	6.000000	185.4300	-42.26000	0.000000
1974:2	9.680000	6.000000	183.2700	-43.85000	0.000000
1974:3	9.590000	6.000000	183.8400	-49.82000	0.000000
1974:4	9.360000	6.000000	185.4700	-60.16000	0.000000
1975:1	8.130000	6.000000	183.5900	-72.59000	0.000000
1975:2	7.700000	6.000000	185.7100	-89.88000	0.000000
1975:3	8.090000	6.000000	183.3000	-109.4600	0.000000
1975:4	8.570000	8.000000	175.4000	-129.3700	0.000000
1976:1	7.270000	8.000000	167.0900	-148.7900	0.000000
1976:2	7.850000	8.000000	167.1100	-170.7900	0.000000
1976:3	8.260000	8.000000	180.1600	-196.3000	0.000000
1976:4	9.620000	8.000000	202.6500	-220.3200	0.000000
1977:1	8.230000	8.000000	226.0900	-237.0400	0.000000
1977:2	6.490000	8.000000	257.5000	-257.4800	0.000000
1977:3	6.150000	8.000000	285.7200	-273.3000	0.000000
1977:4	5.630000	8.000000	304.6800	-288.9800	0.000000

APPENDIX P: THE DATA SET

obs	FINT	INT	FDBT	FIDEF	ERPDD
1966:1	5.030000	7.000000	85.50000	-22.18000	0.000000
1966:2	5.080000	7.000000	80.83000	-18.96000	0.000000
1966:3	5.540000	7.000000	79.35000	-17.67000	0.000000
1966:4	5.560000	7.000000	79.72000	-17.78000	0.000000
1967:1	5.250000	7.000000	80.33000	-18.63000	0.000000
1967:2	4.650000	6.000000	84.93000	-20.79000	0.000000
1967:3	4.720000	6.000000	90.35000	-23.28000	0.000000
1967:4	5.540000	6.000000	94.89000	-25.40000	0.000000
1968:1	6.200000	5.500000	97.69000	-26.60000	0.000000
1968:2	6.330000	5.500000	100.2000	-27.05000	0.000000
1968:3	6.100000	5.500000	101.9800	-26.35000	0.000000
1968:4	5.960000	5.500000	101.4300	-23.99000	0.000000
1969:1	6.350000	5.500000	99.36000	-20.45000	0.000000
1969:2	6.920000	5.500000	103.2300	-17.52000	0.000000
1969:3	6.910000	5.500000	111.6800	-14.98000	0.000000
1969:4	6.860000	5.500000	122.9800	-13.05000	0.000000
1970:1	6.770000	5.500000	132.1100	-11.74000	0.000000
1970:2	6.440000	5.500000	143.1300	-11.67000	0.000000
1970:3	6.410000	5.500000	149.0800	-12.47000	0.000000
1970:4	6.160000	5.500000	147.6900	-14.02000	0.000000
1971:1	5.750000	5.500000	139.8800	-16.09000	0.000000
1971:2	5.210000	5.500000	136.1500	-19.52000	0.000000
1971:3	5.200000	8.000000	134.1000	-23.94000	0.000000
1971:4	4.490000	8.000000	133.8700	-28.85000	0.000000
1972:1	3.930000	8.000000	135.7300	-33.59000	0.000000
1972:2	4.600000	8.000000	142.6900	-38.39000	0.000000
1972:3	5.230000	8.000000	155.1100	-43.02000	0.000000
1972:4	5.230000	8.000000	168.4800	-46.20000	0.000000
1973:1	6.820000	8.000000	177.4800	-47.02000	0.000000
1973:2	6.930000	8.000000	189.1500	-47.87000	0.000000
1973:3	8.870000	6.000000	195.4300	-47.02000	0.000000
1973:4	9.560000	6.000000	193.9300	-44.69000	0.000000
1974:1	9.750000	6.000000	185.4300	-42.26000	0.000000
1974:2	9.680000	6.000000	183.2700	-43.85000	0.000000
1974:3	9.590000	6.000000	183.8400	-49.82000	0.000000
1974:4	9.360000	6.000000	185.4700	-60.16000	0.000000
1975:1	8.130000	6.000000	183.5900	-72.59000	0.000000
1975:2	7.700000	6.000000	185.7100	-89.88000	0.000000
1975:3	8.090000	6.000000	183.3000	-109.4600	0.000000
1975:4	8.570000	8.000000	175.4000	-129.3700	0.000000
1976:1	7.270000	8.000000	167.0900	-148.7900	0.000000
1976:2	7.850000	8.000000	167.1100	-170.7900	0.000000
1976:3	8.260000	8.000000	180.1600	-196.3000	0.000000
1976:4	9.620000	8.000000	202.6500	-220.3200	0.000000
1977:1	8.230000	8.000000	226.0900	-237.0400	0.000000
1977:2	6.490000	8.000000	257.5000	-257.4800	0.000000
1977:3	6.150000	8.000000	285.7200	-273.3000	0.000000
1977:4	5.630000	8.000000	304.6800	-288.9800	0.000000

obs	FINT	INT	FDBT	FIDEF	ERPDD
1978:1	6.200000	8.000000	310.4900	-317.1200	0.000000
1978:2	7.560000	8.000000	321.1700	-392.1600	0.000000
1978:3	8.520000	13.50000	327.4700	-521.2000	0.000000
1978:4	10.25000	13.50000	326.8700	-666.2200	0.000000
1979:1	10.72000	13.50000	317.7900	-733.5400	0.000000
1979:2	10.63000	13.50000	319.8100	-683.3900	0.000000
1979:3	11.44000	13.50000	324.1400	-414.7200	0.000000
1979:4	11.94000	13.50000	328.2600	31.65000	0.000000
1980:1	12.00000	13.50000	331.9500	461.4300	0.000000
1980:2	11.25000	13.50000	342.2000	695.2300	0.000000
1980:3	11.35000	13.50000	359.1900	571.6100	0.000000
1980:4	12.31000	13.50000	373.6700	79.73000	0.000000
1981:1	12.58000	13.50000	377.7300	-552.7000	0.000000
1981:2	12.80000	13.50000	389.2800	-1138.700	0.000000
1981:3	13.78000	19.50000	393.2200	-1488.350	0.000000
1981:4	13.41000	19.50000	385.7600	-1527.050	0.000000
1982:1	12.69000	19.50000	367.6900	-1359.910	0.000000
1982:2	12.29000	10.50000	364.3400	-1201.960	0.000000
1982:3	10.31000	10.50000	367.6700	-1126.840	0.000000
1982:4	8.920000	10.50000	375.2900	-1159.280	0.000000
1983:1	9.540000	10.50000	380.4300	-1216.800	1.000000
1983:2	9.070000	10.50000	401.6000	-1290.110	1.000000
1983:3	8.900000	10.50000	424.6300	-1271.990	1.000000
1983:4	8.680000	14.50000	443.3400	-1154.400	1.000000
1984:1	8.670000	14.50000	456.6200	-1032.030	1.000000
1984:2	8.960000	14.50000	474.1600	-1024.880	1.000000
1984:3	10.00000	16.50000	496.5900	-1219.970	1.000000
1984:4	8.920000	18.00000	513.6200	-1566.120	1.000000
1985:1	10.84000	18.00000	519.4300	-1876.070	1.000000
1985:2	10.00000	18.00000	543.6000	-2094.330	1.000000
1985:3	9.500000	18.50000	570.6100	-2017.650	1.000000
1985:4	9.500000	18.50000	595.3600	-1590.960	1.000000
1986:1	9.640000	18.50000	611.5900	-936.4200	1.000000
1986:2	8.340000	18.50000	654.7300	-236.0000	1.000000
1986:3	7.750000	20.50000	707.6000	456.1300	1.000000
1986:4	8.250000	20.50000	758.0800	1016.300	1.000000
1987:1	8.090000	23.50000	785.5900	1316.990	1.000000
1987:2	7.340000	23.50000	823.9200	1352.060	1.000000
1987:3	8.500000	23.50000	839.1900	1009.790	1.000000
1987:4	8.800000	23.50000	822.2900	421.1600	1.000000
1988:1	7.340000	26.00000	785.6100	-14.98000	1.000000
1988:2	7.170000	26.00000	759.5000	92.70000	1.000000
1988:3	9.000000	26.00000	754.7600	1092.300	1.000000
1988:4	9.590000	26.00000	758.1300	2729.970	1.000000
1989:1	10.00000	26.00000	754.9400	4020.430	1.000000
1989:2	10.34000	26.00000	779.9600	4284.520	1.000000
1989:3	10.50000	26.00000	802.5400	2589.540	1.000000
1989:4	11.00000	26.00000	813.5700	-594.4900	1.000000
1990:1	11.00000	26.00000	809.9100	-3158.450	1.000000

obs	FINT	INT	FDBT	FIDEF	ERPDD
1990:2	11.00000	26.00000	843.2800	-3263.240	1.000000
1990:3	11.00000	26.00000	894.2400	1014.690	1.000000
1990:4	10.25000	33.00000	950.5600	8706.990	1.000000
1991:1	9.590000	35.00000	987.0300	15287.79	1.000000
1991:2	8.590000	35.00000	1045.980	17404.06	1.000000
1991:3	7.920000	32.00000	1085.350	10737.56	1.000000
1991:4	7.000000	20.00000	1090.740	-4429.410	1.000000
1992:1	7.000000	20.00000	1071.150	-22126.02	1.000000
1992:2	6.750000	20.00000	1060.680	-36873.46	1.000000
1992:3	6.340000	36.00000	1068.580	-43939.88	1.000000
1992:4	5.240000	30.00000	1074.590	-41460.64	1.000000
1993:1	4.500000	35.00000	1062.510	-33096.42	1.000000
1993:2	4.500000	35.00000	1086.530	-25098.96	1.000000
1993:3	4.500000	35.00000	1107.410	-20003.87	1.000000
1993:4	4.340000	35.00000	1111.540	-19100.76	1.000000
1994:1	4.170000	30.00000	1088.670	-20598.43	1.000000
1994:2	4.380000	30.00000	1101.610	-23726.95	1.000000
1994:3	4.710000	30.00000	1116.310	-26185.14	1.000000
1994:4	5.340000	33.00000	1121.410	-26889.48	1.000000
1995:1	5.920000	39.00000	1103.630	-25870.06	1.000000
1995:2	6.000000	39.00000	1123.340	-25035.62	1.000000
1995:3	6.000000	45.00000	1143.210	-23907.70	1.000000
1995:4	5.960000	45.00000	1149.820	-22686.62	1.000000
1996:1	5.590000	45.00000	1141.970	-21868.42	1.000000
1996:2	5.460000	45.00000	1143.880	-22362.93	1.000000
1996:3	5.380000	45.00000	1154.730	-24638.31	1.000000
1996:4	5.500000	45.00000	1148.420	-28670.34	1.000000

APPENDIX P: THE DATA SET

obs	FINT	INT	FDBT	FIDEF	ERPDD
1990:2	11.00000	26.00000	843.2800	-3263.240	1.000000
1990:3	11.00000	26.00000	894.2400	1014.690	1.000000
1990:4	10.25000	33.00000	950.5600	8706.990	1.000000
1991:1	9.590000	35.00000	987.0300	15287.79	1.000000
1991:2	8.590000	35.00000	1045.980	17404.06	1.000000
1991:3	7.920000	32.00000	1085.350	10737.56	1.000000
1991:4	7.000000	20.00000	1090.740	-4429.410	1.000000
1992:1	7.000000	20.00000	1071.150	-22126.02	1.000000
1992:2	6.750000	20.00000	1060.680	-36873.46	1.000000
1992:3	6.340000	36.00000	1068.580	-43939.88	1.000000
1992:4	5.240000	30.00000	1074.590	-41460.64	1.000000
1993:1	4.500000	35.00000	1062.510	-33096.42	1.000000
1993:2	4.500000	35.00000	1086.530	-25098.96	1.000000
1993:3	4.500000	35.00000	1107.410	-20003.87	1.000000
1993:4	4.340000	35.00000	1111.540	-19100.76	1.000000
1994:1	4.170000	30.00000	1088.670	-20598.43	1.000000
1994:2	4.380000	30.00000	1101.610	-23726.95	1.000000
1994:3	4.710000	30.00000	1116.310	-26185.14	1.000000
1994:4	5.340000	33.00000	1121.410	-26889.48	1.000000
1995:1	5.920000	39.00000	1103.630	-25870.06	1.000000
1995:2	6.000000	39.00000	1123.340	-25035.62	1.000000
1995:3	6.000000	45.00000	1143.210	-23907.70	1.000000
1995:4	5.960000	45.00000	1149.820	-22686.62	1.000000
1996:1	5.590000	45.00000	1141.970	-21868.42	1.000000
1996:2	5.460000	45.00000	1143.880	-22362.93	1.000000
1996:3	5.380000	45.00000	1154.730	-24638.31	1.000000
1996:4	5.500000	45.00000	1148.420	-28670.34	1.000000

obs	PIDD
1966:1	1.000000
1966:2	1.000000
1966:3	1.000000
1966:4	1.000000
1967:1	1.000000
1967:2	1.000000
1967:3	1.000000
1967:4	1.000000
1968:1	1.000000
1968:2	1.000000
1968:3	1.000000
1968:4	1.000000
1969:1	1.000000
1969:2	1.000000
1969:3	1.000000
1969:4	1.000000
1970:1	0.000000
1970:2	0.000000
1970:3	0.000000
1970:4	0.000000
1971:1	0.000000
1971:2	0.000000
1971:3	0.000000
1971:4	0.000000
1972:1	1.000000
1972:2	1.000000
1972:3	1.000000
1972:4	1.000000
1973:1	1.000000
1973:2	1.000000
1973:3	1.000000
1973:4	1.000000
1974:1	1.000000
1974:2	1.000000
1974:3	1.000000
1974:4	1.000000
1975:1	1.000000
1975:2	1.000000
1975:3	1.000000
1975:4	1.000000
1976:1	1.000000
1976:2	1.000000
1976:3	1.000000
1976:4	1.000000
1977:1	1.000000
1977:2	1.000000
1977:3	1.000000
1977:4	1.000000

APPENDIX P: THE DATA SET

obs	PIDD
1978:1	1.000000
1978:2	1.000000
1978:3	1.000000
1978:4	1.000000
1979:1	1.000000
1979:2	1.000000
1979:3	1.000000
1979:4	1.000000
1980:1	0.000000
1980:2	0.000000
1980:3	0.000000
1980:4	0.000000
1981:1	1.000000
1981:2	1.000000
1981:3	1.000000
1981:4	1.000000
1982:1	1.000000
1982:2	1.000000
1982:3	1.000000
1982:4	1.000000
1983:1	1.000000
1983:2	1.000000
1983:3	1.000000
1983:4	1.000000
1984:1	1.000000
1984:2	1.000000
1984:3	1.000000
1984:4	1.000000
1985:1	1.000000
1985:2	1.000000
1985:3	1.000000
1985:4	1.000000
1986:1	1.000000
1986:2	1.000000
1986:3	1.000000
1986:4	1.000000
1987:1	1.000000
1987:2	1.000000
1987:3	1.000000
1987:4	1.000000
1988:1	1.000000
1988:2	1.000000
1988:3	1.000000
1988:4	1.000000
1989:1	1.000000
1989:2	1.000000
1989:3	1.000000
1989:4	1.000000
1990:1	1.000000

APPENDIX P: THE DATA SET

obs	PIDD
1990:2	1.000000
1990:3	1.000000
1990:4	1.000000
1991:1	1.000000
1991:2	1.000000
1991:3	1.000000
1991:4	1.000000
1992:1	0.000000
1992:2	0.000000
1992:3	0.000000
1992:4	0.000000
1993:1	0.000000
1993:2	0.000000
1993:3	0.000000
1993:4	0.000000
1994:1	0.000000
1994:2	0.000000
1994:3	0.000000
1994:4	0.000000
1995:1	0.000000
1995:2	0.000000
1995:3	0.000000
1995:4	0.000000
1996:1	0.000000
1996:2	0.000000
1996:3	0.000000
1996:4	0.000000