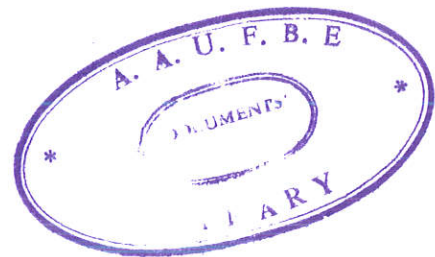


ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
FACULTY OF BUSINESS AND ECONOMICS



THE DETERMINANTS OF FOREIGN DIRECT INVESTMENT
IN ZAMBIA

A THESIS submitted to the School of Graduate Studies in partial fulfilment of the requirement of the degree of Master of Science in Economics (Economic Policy Analysis).



BY

SAMUEL BWALYA MULENGA

JUNE, 1997

ADDIS ABABA UNIVERSITY
School of Graduate Studies



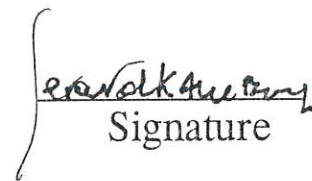
The Determinants of Foreign Direct Investment in Zambia



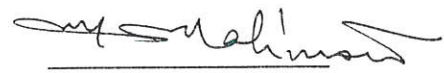
By
Mulenga Samuel B.
Faculty of Business and Economics

Approval by Board of Examiners:

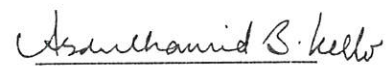
Dr. Gerard Kambou
Advisor


Signature

Dr. I. Mahmud
External Examiner


Signature

Dr. Abdulhamid Bedri
Internal Examiner


Signature



DEDICATIONS

This thesis is dedicated to my parents and my sisters, Josephine, Gillian, Juliate and Prudence.

ACKNOWLEDGMENT

My sincere gratitude goes to Dr. G Kambou for his professional advice and comments, and the African Economic Research Consortium (AERC) for financial assistance. I wish to thank Mr C.D Opoku, Mr J.D Nkurunziza, Mr W.Akpalu and all my colleagues and friends for their comments and moral support. Finally, I should acknowledge the support from Ms Christine Mfula at the Organisation of African Unity during the preparation of this thesis.

ABSTRACT

This study tests the determinants of Foreign Direct Investment (FDI) in Zambia and its effects on the trade balance. The results suggest that Natural resource endowment, foreign debt overhang, domestic credit availability, the size of domestic market, and risk and uncertainty in the investment environment are the most important macroeconomic determinants of FDI in Zambia. Furthermore, the results indicate that FDI promotes exports and is import substituting in Zambia. Thus, attracting more inflows of FDI would favourably impact on Zambia's trade balance and the overall balance of payments.



TABLE OF CONTENTS

PAGE

CHAPTER 1	2
1.0 INTRODUCTION	2
1.1.1 STATEMENT OF RESEARCH PROBLEM	2
1.1.2 OBJECTIVES:	4
1.1.3 STATEMENT OF HYPOTHESES	4
1.1.4 SIGNIFICANCE OF THE STUDY:	5
CHAPTER 2	7
2.0 THE ZAMBIAN ECONOMY	7
2.1 AN OVERVIEW OF THE ZAMBIAN ECONOMY	7
2.2 TRENDS IN FDI AND THE INVESTMENT ENVIRONMENT IN ZAMBIA	11
2.3.1 PLEDGED FDI BETWEEN 1990 AND 1996 IN US\$ MILLION	13
2.3.2 TRENDS IN FDI IN SELECTED COUNTRIES	16
CHAPTER 3	18
3.0 LITERATURE REVIEW	18
3.1 THEORETICAL AND CONCEPTUAL FRAMEWORK:	18
3.1.1 DEMAND SIDE DETERMINANTS OF FDI	19
3.1.2 SUPPLY SIDE DETERMINANTS OF FDI	21
3.1.3 MACROECONOMIC DETERMINANTS OF FDI	22



3.2 REVIEW OF EMPIRICAL LITERATURE	25
CHAPTER 4	30
4.0 EMPIRICAL MODEL AND METHODOLOGY	30
4.1 EMPIRICAL MODEL	30
MODEL 1: DETERMINANTS OF FDI	30
4.1.1 VARIABLE SPECIFICATION FOR MODEL 1	30
MODEL 2: IMPACT OF FDI ON EXTERNAL TRADE	36
4.1.2 THE EXPORT FUNCTION	36
4.1.3 IMPORT FUNCTION	38
4.2 METHODOLOGY AND DATA:	40
4.2.1 TEST FOR STATIONARITY	40
4.2.2 DIAGNOSTIC TESTS	42
4.2.3 PARAMETER STABILITY TEST.	43
4.2.4 BETA COEFFICIENT TEST	44
4.3 DATA AND DATA SOURCES	45
CHAPTER 5	48
5.1 INTERPRETATION OF RESULTS	48
5.1.1 THE OVERALL VALIDITY OF THE ESTIMATES ...	48
5.1.2 TEST FOR STATIONARITY	49
5.1.3 DIAGNOSTIC TESTS	50
5.2 EMPIRICAL RESULTS AND INTERPRETATION.	51
5.3 THE NET EFFECT OF FDI ON TRADE	58

5.3.1 THE EFFECT OF FDI ON EXPORTS	58
5.3.2 THE EFFECT OF FDI ON IMPORTS	62
5.3 4 OVERALL NET EFFECT OF FDI ON THE TRADE ACCOUNT.	64
CHAPTER 6	66
6.0 SUMMARY, POLICY IMPLICATIONS AND CONCLUSION .	66
6.1 SUMMARY	66
6.2 POLICY IMPLICATIONS AND RECOMMENDATIONS	66
6.3 CONCLUSIONS.	68
APPENDICES	70
BIBLIOGRAPHY	76

ADDS ABABA
UNIVERSITY
LIBRARIES

CHAPTER 1

1.0 INTRODUCTION

1.1.1 STATEMENT OF RESEARCH PROBLEM

In the wake of the 1982's 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, 1994). 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 reduced 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% (Hooshang and Weiping, 1994), and Zambia 0.04% of the total FDI flows.

FDI can help the economic prospects of countries like Zambia in several ways. First, as a source of development finance, FDI helps to finance investment in the

economy. Second, FDI increases the level of technical progress in the host country which, in turn, plays an important role in the process of economic development. Third, apart from being a source of development finance and a channel for technology transfer, FDI has a number of proven attributes. It improves managerial knowledge and skills, efficiency and productivity, and provides a wide array of goods and services to the economy. Furthermore, to the extent that FDI promotes exports, it can have a positive impact on the country's balance of payments. If Zambia could reap these benefits of FDI and properly integrate them into the economy, its prospects for economic growth would certainly improve.

In 1991, the Zambian government seriously embarked on the implementation of the orthodox structural adjustment program with the objective of restoring macroeconomic stability, strengthening domestic resource mobilization, and increasing investment and real per capita income. Given the large domestic resource transfer abroad implied by Zambia's foreign debt, reduced recourse to international capital markets, and negligible inflows of portfolio investment, FDI has been expected to help bridge the domestic resource gap, raise investment levels and move the economy onto the path of rapid and sustainable economic growth. However, the inflows of FDI have been lower than anticipated. This raises two important policy questions: (i) why have FDI inflows remained low in the face of the government reform programme, and (ii) what could be done to stimulate them? This thesis addresses these questions. It uses an econometric model to empirically test the impact of government policies on FDI.



1.1.2 OBJECTIVES:

The principal objective of this study is to empirically analyze the determinants of foreign direct investment in Zambia, using time series data from 1970 to 1995. Specific objectives are to:

- (1) assess the effects of factors such as economic growth in FDI sourcing countries, foreign interest rates and internal macroeconomic factors on the flow of FDI in Zambia,
- (2) analyze the links between trade and foreign direct investment, focusing on the impacts of FDI on Zambia's trade account (imports and exports); and
- (3) document the response of foreign direct investment to macroeconomic instability in Zambia.



1.1.3 STATEMENT OF HYPOTHESES:

The study treats FDI as an endogenous variable being determined by various explanatory variables, both internal and external¹. The specific hypotheses to be tested in this study are:-

- (1) Natural resource endowment attracts FDI in Zambia.
- (2) Macroeconomic factors, and macroeconomic instability (Uncertainty) influence the inflow of foreign Direct investment in Zambia.
- (3) An increase in foreign Direct Investment is likely to have a favourable impact on Zambia's trade account.

1.1.4 SIGNIFICANCE OF THE STUDY:

This study is an econometric analysis of the major macroeconomic determinants of foreign direct investment in Zambia. Most studies on the determinants of FDI in Sub-Saharan Africa are of cross sectional type, and have in most cases applied descriptive

Foreign investment is motivated by microeconomic and macroeconomic factors on one side and non economic factors on the other. The fact that this study seeks to highlight the major macroeconomic factors(internal and external to Zambia) plus some non economic factors is by no means to imply that microeconomic determinants are less important determinants of FDI in Zambia.

analysis. This study will apply econometric techniques on data from Zambia to analyze the determinants of FDI. 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 Zambia, and could help the government of Zambia formulate consistent policies that will attract FDI. Moreover, 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 Zambia.

CHAPTER 2

2.0 THE ZAMBIAN ECONOMY

This chapter is divided into two parts. The first part provides an overview of the Zambian economy and the second part reviews the trends of foreign direct investment in Zambia and some selected developing countries.

2.1 AN OVERVIEW OF THE ZAMBIAN ECONOMY

Zambia, previously known as Northern Rhodesia, became a British protectorate in 1911. Before this, the British South African Company (BSA.Co) had acquired land and mineral rights following the Barotseland agreement. This, perhaps, was the first form of FDI in Zambia. By 1920, mining had intensified in the copperbelt region and the country had become virtually a mineral dependent economy. Since then, the fortunes of and constraints to the Zambian economy have evolved around copper revenues. Within six to seven years following independence in 1964, the Zambian economy showed great potential for economic growth, with an average growth rate of 4.2% between 1970 and 1974. The high rates of growth were conditioned by favourable copper prices on the international market, foreign aid, and the inflow of private foreign capital.

During the era of copper boom, the government invested heavily in the parastatal sector through the mother body, the Industrial Development Corporation (INDECO). This was accompanied by high tariffs and restrictive import licensing to protect the parastatal sector. The average effective rate of protection hovered between 29.8% for heavy intermediate goods to 472.9% for durables. However, most public enterprises which benefitted from the copper boom revenues were inefficiently run and imposed high costs on government. In addition to heavy public investment in the parastatal sector, economic policy (and hence government expenditure) was more geared to the maintenance of high consumption levels which, by the 1980s, had risen to 87% of GDP (Seshamani, 1995). This further weakened government fiscal discipline.

Zambia's economic crisis emerged after a sharp decline in the copper prices from US\$0.93 per pound in 1974 to US\$0.56 per pound in 1975. This was further compounded by the effects of the world energy crisis of 1973/74. These shocks caused a deterioration in most macroeconomic variables. From 1975 onwards the fiscal and current account balances sustained large deficits, except in 1979 when a surplus in the current account balance was attained. These deficits were financed by borrowing from the world capital markets. The foreign debt stock, as a result, rose from US\$1.0 billion in 1973 to US\$2.6 billion in 1978. Nevertheless, the government continued to finance its expenditure by depleting the stock of foreign reserves, and borrowing from domestic sources. Printing money to finance government expenditure became more common as revenue collections fell and borrowing from abroad became difficult. The consequences were rising inflation,

an appreciating real exchange rate, falling export revenues, and rising balance of payment deficits.

Macroeconomic stability became increasingly difficult to maintain. In 1978, Zambia concluded a two-year stabilization program with the International Monetary Fund (IMF). The package included measures designed to restrain domestic demand growth, payment of foreign debt and reduction of arrears, and the realignment of the exchange rate. The 1978 arrangement was later followed by an extended facility program concluded in 1981. Despite the stabilization program, inflation continued sky-rocketing, rising from 7.1% in 1981 to 82.3% in 1986. As the economic crisis persisted, the government abandoned the IMF/IBRD adjustment program. A "home grown" program called the New Economic Recovery program (NERP), was designed in May, 1987. Its principal objective was to achieve economic growth by utilizing domestic resources. The program contained measures such as pegging the foreign exchange rate at K40 to US\$1, and the introduction of a foreign exchange allocation system managed by the Foreign Exchange Management Committee (FEMAC). Administrative controls were re-introduced, and more importantly, foreign debt servicing was limited to 10% of total export earnings (Mwanza, 1992). Despite all these efforts to stabilize the economy, investment and savings continued to fall in the midst of chronic foreign exchange shortages. NERP failed to generate enough revenue to service the foreign debt; as a result, the debt crisis deepened further. The government's reputation and credibility deteriorated. Foreign financing dried up, declining from 8.5% to -1.2% of GDP between 1985 and 1987. Net capital inflows dropped from US\$21.9

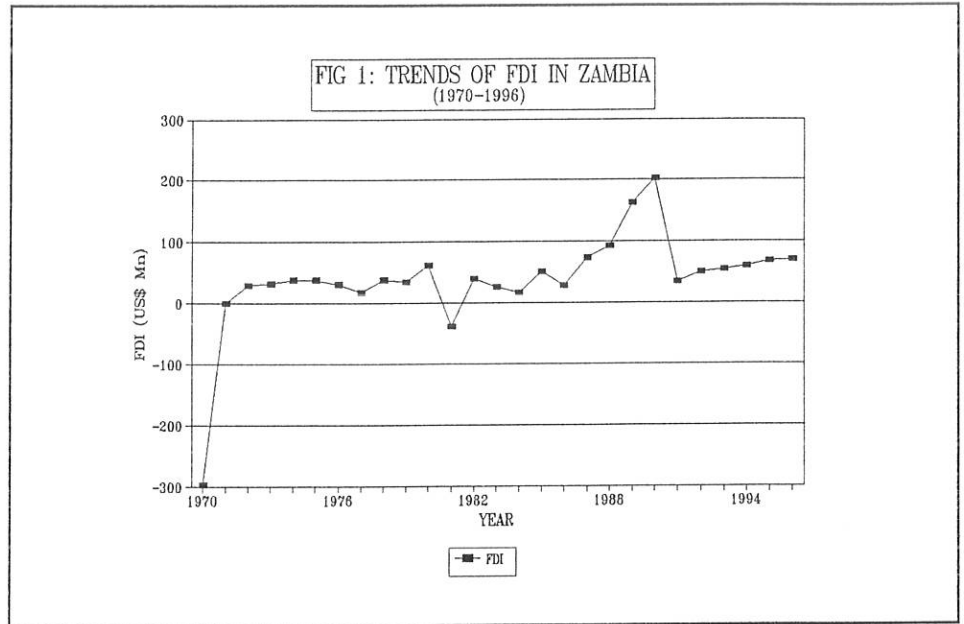
million in 1986 to -\$161.69 million in 1987. Zambia oscillated back to the IMF/World Bank adjustment program in 1989.

In 1991, multi-party elections were held which ushered the Movement for multi-party Democracy (MMD) into power. A key objective of the MMD economic recovery program was the "restoration of the economic growth prospects by stabilizing the economy, moving toward external viability, promoting the private sector based on free market principles, disengaging the government from commercial activities (through privatization of the parastatal sector) and reversing Zambia's social sector delivery system and infrastructure"(GRZ, PFP (1995-1998), 1995, p.2). Considerable progress has been made towards achieving these objectives. The government has successfully liberalized the product, factor and asset markets. The interest rates and exchange rates are now market determined with minimum government intervention. In addition, quantitative controls on imports have been removed, tariffs have been reduced, and several major fiscal policy measures were put in place. On the expenditure side, the cash budget was introduced such that government spending takes place only when revenues are available. On the revenue side, the Zambia Revenue Authority (ZRA) was established to collect and administer taxes, and improve compliance. In 1995 the Value Added (VAT) Tax was introduced to replace sales tax in an effort to broaden the tax base and improve tax efficiency. These measures helped to restore macroeconomic stability. The rate of inflation dropped, real interest rates became positive, and the exchange rate was relatively stable by 1994. In spite

of these achievements, the supply response has been weak, with private investment, both domestic and foreign, remaining low.

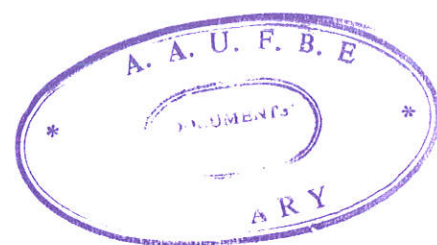
2.2 TRENDS IN FDI AND THE INVESTMENT ENVIRONMENT IN ZAMBIA

Zambia's domestic economic policy has had an overwhelming influence on the pattern of foreign resource flows in Zambia. In 1968 and 1969, the government of president DR. Kaunda instituted economic reforms referred to as the Mulungushi and Matero reforms respectively. The Mulungushi reform declarations requested that private companies surrender to the state 51% controlling shares in major non-mining enterprises. Later in 1969, the Matero reforms extended the Mulungushi reforms to the mining sector. These reforms provoked a drastic outflow of private capital. Net FDI became negative, declining to -US\$297 million in 1970. A good number of companies closed down and moved abroad. The outflow of private foreign capital was also a clear indication that the Matero and Mulungushi economic reforms contained dis-incentive measures, such as politicising the control and management of firms in which the government acquired shares. This ultimately scared foreign investment in Zambia. Figure 1 below shows the trends of FDI inflow in Zambia between 1970 and 1996.



In 1972, FDI recovered, with an inflow of US\$29.31 million. Between 1972 and 1980 an average of US\$ 32.13 million was recorded, and in 1980 FDI rose to US\$61.57. This was followed by a drastic decline in 1981, which was reversed in the following year. The government resumed the implementation of the IMF/World Bank adjustment program in 1989. As a result of the government's commitment to the adjustment program, foreign investors' confidence in the country's economic policies was restored, net FDI rose from US\$74.51 million in 1987 to US\$202.78 million in 1990. However, the government's commitment to the implementation of the reform program was later weakened by public resistance and in November 1990, Dr Kaunda's government survived a military coup attempt. The ensuing political and civil instability induced a fall in net FDI to \$34.34 in 1991.

Following the 1991 multi-party elections, the MMD government undertook several macroeconomic measures to stabilise the economy and implemented wide ranging institutional reforms to create an enabling business environment. First, the Zambia Privatization Agency (ZPA) was established under the privatization act of 1993 to implement the government's privatisation program. Second, the banking and financial service legislation was revised, and the Lusaka Stock Exchange (LUSE) was established as initial steps toward the development of capital markets. The Securities and Exchange commission (SEC) was also established to deal with the issuance and approval of investment dealership on the stock exchange. Third, the investment act of 1993 promulgated the establishment of the investment centre (ZIC) to coordinate and promote foreign investment in Zambia. In the same way, various pieces of legislation have been passed to help create an enabling investment environment and a dynamic private sector driven economy. Foreign investors have responded positively to these reforms. In the following sub-section, we describe the trends of FDI in Zambia.



2.3.1 PLEDGED FDI BETWEEN 1990 AND 1996 IN US\$ MILLION

Table 2.1 shows the level of pledged FDI in Zambia. The level of pledged FDI increased from US \$4.23 million in 1990 to US \$313.7 million in 1993. In 1994, Pledged

FDI fell by almost 50% from its 1993 level. After 1993, an upward trend of pledged FDI has been maintained for the rest of the period. However, only 25% of total pledged investment has been translated into actual investment (Zambia Investor, 1996). Despite a substantial progress in creating an enabling investment environment, investors seem to have adopted a "wait and see" strategy regarding the sustainability of the economic reforms that the government has been implementing since 1991. Thus, this slow translation of pledged FDI into actual investment seems to suggest that the level of uncertainty and risk in the investment environment is still high. If this is the case, the government's reputation and the credibility of its policies will have to improve so as to restore investors' confidence and raise FDI inflows in the economy.

TABLE 2.1: ZAMBIA: PLEDGED FDI BY SECTOR IN US\$ MILLIONS

SECTOR	YEAR								TOTAL	% OF TOTAL
	1990	1991	1992	1993	1994	1995	1996			
Agri&fish	0.80	1.38	52.57	78.1	54.4	51.3	120.6	359.15	24.7	
Manufactur	0	0.88	145.17	132.8	60.3	99.8	29.0	467.95	32.2	
Mining	0	0.02	3.61	10.7	18.1	1.4	0	33.83	2.3	
Tourism	0.77	203.25	14.55	15.8	6.8	5.8	11.0	257.97	17.8	
transport	2.56	2.95	68.73	58.7	12.3	6.7	62.1	214.04	14.7	
Others	0.10	0.78	4.91	17.6	7.7	29.4	59.1	119.59	8.2	
TOTAL	4.23	209.26	289.54	313.7	159.6	194.4	281.8	1452.53	100.00	

SOURCE: Zambia Investment Centre, 1995 & 1997, Lusaka. The last column shows pledged FDI in each sector as a percentage of the pledged FDI all sectors between 1990 and 1996. Percentages may not add-up to 100 due to rounding off errors.

The sectoral analysis of FDI reveals that the manufacturing sector has received the largest fraction of pledged FDI (US\$467.95mn), followed by agriculture (US\$359.15mn), Tourism (US\$259.97mn) and transport (US\$214.04mn). This distribution of pledged FDI seems to suggest that FDI in Zambia is attracted by the country's natural resource potential, and that much of FDI in the manufacturing sector is likely to be natural resource based (UNCTAD 1995 p71). In terms of actual investments, the tourism sector has recorded a strong investment performance (both from domestic and foreign investors) since 1992. The total actual investment in the tourism sector rose from K0.67bn to K2.84bn in 1993 and K9bn in 1995 (The Presidential Speech, 1996). More pledged and actual foreign investment is expected for the exploration and exploitation of the country's abundant natural resources. The government's decision to liberalize the mining industry is expected to attract greenfield foreign investments in the mining sector and increase the

flows of FDI in Zambia. For example, the joint venture between the Zambian government and Anglo American corporation on the Konkola Copper Mine Project is expected to infuse about US\$ 600 million in the mining sector.

2.2.2 TRENDS IN FDI IN SELECTED COUNTRIES

Table 2.2 below shows the recent trends of FDI in selected developing countries.

TABLE 2.2: TRENDS IN FDI IN SELECTED COUNTRIES IN BILLIONS US\$

Region	1983	1985	1987	1989	1990	total	%total	%region
Developing	16.29	12.25	18.33	31.13	28.65	161.34	100	-
Asia	5.84	5.06	7.06	18.80	18.55	89.61	55.5	100
Africa	1.19	0.78	0.55	2.68	1.20	10.07	6.2	100
China	0.64	1.66	1.88	3.39	3.49	17.82	11.0	19.9
Zambia	.017	.028	.074	.203	.03	0.63	0.04	6.3
Nigeria	0.34	0.48	0.17	1.88	0.58	4.64	2.9	46.1

SOURCE: UNCTAD, 1995, Hoosbnag, et al, 1994. % Total is the percentage of total FDI flows to developing countries between 1983 and 1990, %Region is the percentage of the regional total FDI between 1983 and 1990.

The inflow of FDI to all developing countries depicts an increasing trend, with FDI inflows rising from US\$16.29 billion in 1983 to US\$28.65 billion in 1990. Between 1983 and 1990, total FDI flows to developing countries was US\$161.34 billion. Of this total, Asia received the largest share accounting for 55.5%, while Africa received the smallest share, accounting for only 6.2%. Within the Asian sub region, China recorded the largest share, accounting for about 19.9% of the total FDI flows to Asia (i.e 11.1% of the

total FDI to developing countries) which is almost twice that of Africa. Egypt and Nigeria are the two largest recipients of FDI flows to Africa. Nigeria accounted for about 46.1% of total FDI flows in Africa, or about 2.9% of the inflows to developing countries. Zambia, on the other hand, received 6.3% of the total FDI inflows to Africa, which represents about 0.04% of the total FDI inflow to all developing countries.

CHAPTER 3

3.0 LITERATURE REVIEW

3.1 THEORETICAL AND CONCEPTUAL FRAMEWORK:

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 movement of technology, managerial and organizational skills together with capital (Soderstein, 1992)².

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. For example, Chankravarty (1961) has documented that the inter-play of social, political and economic factors is relatively more important in determining the direction

"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).

of international capital flows. Generally, FDI is said to be affected by demand factors, supply factors, and macroeconomic factors. We review these determinants in turn.

3.1.1 DEMAND SIDE DETERMINANTS OF FDI.

In this sub-section we review some demand side determinants of FDI. These include the size of the domestic market, production and marketing cost advantages³.

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; 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.

³ *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" (Meier, 1995, p.9), foreign investment, especially from technologically advanced countries, is likely to be attracted by countries with high skilled labour coupled with relatively lower wages. (Hooshang and Weiping, 1994). 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 (UNCTAD, 1995, p.9).

3.1.2 SUPPLY SIDE DETERMINANTS OF FDI.

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 country⁴. 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

⁴ Krainer (1967) studied British investment abroad, which is predominantly based on exploitation the 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 aboard. Contrary to this, Krainer in the same study found USA investment abroad, which is mainly in manufacturing, to fall when the USA economy grows.



influence the flow of FDI (Krainer, 1967). For instance capital inflows to most African countries are significantly attracted to natural resources. 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 (UNCTAD, 1995, p.34). Natural resource endowment has been confirmed as an important determinant of FDI in most countries (see Kojima, 1973; Zhang and Hock, 1996; and UNCTAD, 1992 and 1995).

3.1.3 MACROECONOMIC DETERMINANTS OF FDI.

The macroeconomic 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 framework, taxation, subsidies and foreign debt. These factors may influence the inflow of FDI through their impact on investment risk and uncertainty. Some of these factors are discussed below.

According to the accelerator principle of investment, fixed business investment responds to changes in the desired level of 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; 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 uncondusive 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 (Jarospensen 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 into 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).

3.2 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), credibility, 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.

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 dependant 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. He found that real income per-capita, the rate of inflation, world interest rate, credit-rating and foreign debt service are important determinants of FDI in Nigeria.

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 1977 to 1992 was used. The explanatory variables included tariffs, 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_{t-1} 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 and Swain, 1995). The implication is that foreign investors complement their working capital by borrowing from the host country's financial markets. In this case domestic financial deepening 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 costs and FDI in China concurs with the findings of

Woodward & Rolf (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 and Hock (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 Nations (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 and Hock, 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 and Hock, 1996). The degree of openness of the host country to trade improves the inflow of FDI into the host

country (Gary et al, 1994). 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 Swain (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 liquidity⁵ (profitability) of already established firms.

Gray Hufbauer, Darius 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 dependant 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

⁵ A standard problem in testing the influence of corporate liquidity on investment is that increases in liquidity are likely to be correlated with unobservable disturbances that increase the profitability of the firm's current activities and investment.

host country to trade, the distance between the hub and the partner, several regional dummies, and a time trend. The results show 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. Collghhin 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 home country import or export as a dependant variable. The results illustrate different effects of FDI on trade. In Sweden and Japan for instance, FDI tended to promote more imports than export, 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 GDP, host country's capacity to import and previous level of imports. He then introduced FDI in the export and import functions of the two countries. He found out that FDI generates positive and negative net trade effects in China and Hungary respectively.

This review of the empirical literature on the determinants of FDI points to the fact that there are various factors that influence the flows of foreign private investment. The survey of empirical literature also suggests that foreign capital inflows can generate either positive or negative trade effects in the host country. This thesis will attempt to identify the major macroeconomic determinants of foreign investment in Zambia and analyze the net trade effects that FDI is likely to induce in the economy.

CHAPTER 4

4.0 EMPIRICAL MODEL AND METHODOLOGY

4.1 EMPIRICAL MODEL

The empirical framework consists of two models. Model 1 tests the determinants of FDI while model 2 tests the link between FDI and trade.

MODEL 1: DETERMINANTS OF FDI

4.1.1 VARIABLE SPECIFICATION FOR MODEL 1

The choice of the explanatory variables was based on Pain's (1993) theoretical formulation of the long run model of FDI and the survey of both the theoretical and empirical literature. Below we provide a brief discussion of the variables specified in model (1).

The market size hypothesis, captured by the logarithm of per-capita income, is expected to be positively related with FDI. Hence, the larger the size of the domestic

market the larger the inflow of FDI. Apart from being a measure of liquidity in the economy (for households, firms and government), per-capita income has been used in some studies as a measure of infrastructural development (Loree and Guisinger, 1995).

The cost of capital: The annualized weighted average treasury bill rate (TBD) will be used to measure the cost of domestic capital (i.e the cost of bank credit). High cost of domestic bank credit is expected to adversely affect the inflow of FDI. The US long term bond rate (USBD) is used as a proxy for the opportunity cost of capital (FDI)⁶. 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 US long term bond rate is expected to have a negative impact on FDI in our model.

The production cost hypothesis: The ratio of the Zambia's manufacturing wage to the US wage rate (WGD) and manufacturing labour productivity (LPD) will be used to test the production cost hypothesis. LPD is expected to take a positive sign because higher labour productivity lowers the marginal cost of production, and may attract more FDI in capital intensive sectors (high technology sectors). The expected impact of WGD cannot be ascertained a priori. The conventional expectation is that the wage rate should be negatively related to FDI. However, as urged by Swedenborg (1979), high wage rates

⁶USA bond rate is chosen to proxy for long term market opportunities open to foreign investors since USA is one of the top four foreign investing countries in the world. See also Wang et al (1995).

may imply high skill intensity. High skill intensity in turn may attract foreign investment in high technology sectors thereby taking a positive relationship with FDI.

Devaluation: Changes in the exchange rate (PFOREX) captures the effect of devaluation of the host country's currency relative to that of the sourcing country. Manufactured goods in Zambia have a high import content (intermediate and capital inputs). Since real devaluation raises the price of imported intermediate inputs and hence the cost of production, the exchange rate is often viewed as an alternative measure of the cost of capital (Pain 1993). In this respect, real devaluation is expected to negatively affect foreign investment. On the other hand, real devaluation may reduce the cost of production in terms of local currency, thereby attracting foreign investment. The effect of real devaluation cannot be determined a priori.

Economic prosperity in FDI home region: The economic growth in OECD countries (GR) is introduced in the model to capture the effect of changes in corporate liquidity in FDI home countries. The assumption is that cross-border investments emerge as a result of economic growth in the FDI home region. Therefore, a positive sign is anticipated on this variable.

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 (MNC) 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. Zambia's primary commodity exports expressed as a ratio of GDP (NR) is used as the measure of natural resource potential. A positive correlation between Zambia's natural resource potential and FDI is anticipated.

Risk, Uncertainty and Policy Credibility: We presuppose that the nature of the business environment is likely to exert an overwhelming influence on the flow of foreign investment. Since private investment is either prohibited or delayed in an uncertain investment environment due to high cost of future information (option value) and the irreversible nature of fixed investment, factors that are likely to worsen the business environment would adversely effect both domestic and foreign investment. Various variables are used in this study to measure risk, uncertainty and policy credibility. These include foreign debt service expressed as a ratio of GDP (DSER), Government fiscal deficit expressed as a ratio of GDP (GDEFD), and macroeconomic instability measured both by the inflation rate (INFD) and the exchange rate variability measured by the change in the cost of foreign exchange (EXVAR).

Foreign debt (DSER) and its associated resource transfer to creditors is an important source of instability and uncertainty (Serven & 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, DSER is expected to take a negative sign.

Government fiscal deficits (GDEFD). Anthony et al (1990) indicate that "high fiscal deficits are viewed as an indication of future financial repression in the financing of the domestic economy. Even if the deficit is neither financed through taxation nor the sale of government bonds, the implications of high government deficits are high inflation and currency devaluation." (Ayiyi, 1992 p.6) Therefore, high government deficits is expected to negatively affect the inflow of FDI in Zambia.

Macroeconomic Instability: Price instability (INF) and high exchange rate variability (EXVAR) 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 on these variables is anticipated.

Financial development: The model considers four financial variables. Financial deepening (M2RD) calculated as a ratio of broad money (M2) to GDP, the depth of

financial intermediation (QSM), calculated as quasi money over GDP, financial repression⁷ (FRP) and domestic credit to the private sector (PCCRD). These variables are used to test the effect of financial development on FDI. Financial intermediation improves financial resource mobilization and the overall efficiency of investment. In this regard, QSM is expected to impact positively on the flow of FDI. Financial deepening is also expected to have a positive impact on FDI. Repressive financial policies, as discussed in the literature, are expected to have a negative impact on the FDI. PCCRD has been included in the model based on the assumption that in developing countries, it is not the cost of capital but rather the availability of domestic credit that inhibits investment. In this regard, the effect of the cost of domestic credit on FDI will be compared to the effect of credit availability. PCCRD is expected to be positively related to FDI.

Our empirical model is stated in semi-logarithmic functional form for the reason that some of the variables take positive and negative values and hence cannot be expressed in logarithms. The endogenous variable, foreign direct investment, is expressed as a ratio of GDP (FDIR). This is motivated by the need to avoid problems of spurious regression results that arise when the dependent variable has a significant time trend (Granger and Newbold, 1974). Similarly, other variables have been expressed either in ratios or in logarithms. Our empirical model is thus stated as:

⁷ See the section on data and methodology for the definition of financial repression.

$$\begin{aligned}
FDIRD = & \alpha_0 + \alpha_1 LnPGDPD + \alpha_2 WG + \alpha_3 USBD + \alpha_4 GR_1 + \alpha_5 LPD \\
& + \alpha_6 TBD + \alpha_7 NR + \alpha_8 LnPCCRD + \alpha_9 PFOREX + \alpha_{10} QSMD \\
& + \alpha_{11} RISK + \alpha_{12} FRP + \epsilon \dots (4.1)
\end{aligned}$$

where; FDIRD is the first difference of foreign Direct Investment expressed as a ratio of GDP, LnPGDPD is the first difference of the logarithm of per capita GDP, WG is the ratio of Zambia manufacturing wage rate to USA wage rate, USBD is the first difference of USA long term bond rate, GR₁ is the economic growth rate in OECD countries lagged by one period, LPD is the first difference of manufacturing labour productivity in Zambia, TBD is the first difference of the Zambia's annualised treasury bill rate, NR is natural resource endowment, LnPCCRD is the first difference of private sector credit expressed as a ratio of total domestic credit, PFOREX is the price of foreign exchange (Kwacch /USA Dollar), QSMD is the first difference of financial intermediation, RISK = f(Foreign debt service (DSER), Inflation (INF), government deficit (GDEFD), Exchange rate variability (EXVAR)), FRP is Financial repression and ϵ is a stochastic term, Ln is the natural logarithm operator. The time subscript has been omitted for brevity. The expected signs of the coefficients are specified below:

$$\alpha_1, \alpha_4, \alpha_5, \alpha_7, \alpha_8, \alpha_{10} > 0; \alpha_2, \alpha_9 > \text{or} < 0, \alpha_3, \alpha_6, \alpha_{11}, \alpha_{12} < 0.$$

MODEL 2: IMPACT OF FDI ON EXTERNAL TRADE

4.1.2 THE EXPORT FUNCTION

The factors that influence exports typically include the domestic prices of exports, the price of goods that compete with Zambia's exports, and world demand conditions. In our model, we specify export as a function of the host country's economic development, the terms of trade, income growth in the importing region, the devaluation of the exporting country's currency, the openness of the economy and population growth. A time trend is added as an alternative measure of economic development and also to capture other structural factors not included in the model⁸. We therefore express our export function as:

$$\text{EXPORT} = f(\text{GDP}, \text{TOT}, \text{GR}, \text{OPEN}, \text{POPGR}, \text{TIME}, \text{PFOREX}) \dots(4.2)$$

The terms of trade variable (TOT) captures the changes in the world price of exports. Since the terms of trade are calculated as a ratio of the export price index to the import price index, an improvement in the TOT should positively affect export growth.

⁸ See wang (1995) and Bas Van (1996)

The economic growth (GR) in the OECD countries is used to capture the demand for Zambia's exports. Economic growth rate in OECD countries (GR) and Zambia's GDP are expected to be positively related to the host country's exports. Population growth of the exporting country (POPGR) is used as a proxy for domestic demand for exports and is anticipated to exert a negative impact on exports (Gary et al, 1994). A one year lag on POPGR is added to account for lags in supply response to changes in demand conditions. Devaluation of the exporting country's currency (PFOREX) may improve its export competitiveness in international markets and, other things being equal, induce a growth in exports. An export oriented trade regime is likely to improve the export performance of the economy. Therefore, the openness of the exporting country to trade, measured as a ratio of total trade to GDP (OPEN), is included in the export function and is expected to assume a positive sign.

To equation (4.2), we add a one year lag of exports as an explanatory variable based on the fact that last year's exports may influence future levels of exports. To test the effect of FDI on exports, FDI expressed as a ratio of GDP (FDIR), is introduced in the export function. If the coefficient of FDIR is positive and significant FDI is said to promotes exports, otherwise, it depresses exports. Equation (4.2) is linearised and expressed as:

$$LEXPO = \alpha_0 + \alpha_1 LGDP + \alpha_2 LOPEN + \alpha_3 FDIR + \alpha_4 PFOREX + \alpha_5 LTOT +$$

$$\alpha_6 POPGR_1 + \alpha_7 LEXPO_{-1} + \alpha_8 TIME + \epsilon_t \dots (4.3)$$

$\alpha_1, \alpha_2, \alpha_4, \alpha_5, \alpha_8 > 0$; $\alpha_6 < 0$; $\alpha_3, \alpha_7 > \text{or} < 0$. ϵ_t is a stochastic term and L is logarithm operator, the rest of the variables as defined above.

4.1.3 IMPORT FUNCTION

To analyze the effects of FDI on imports we formulate an import demand function for Zambia. Demand for imports largely depends on GDP, the terms of trade (TOT), and the country's capacity to import, determined by the availability of foreign exchange. The amount of foreign exchange available depends on the country's export revenues, private (PTRNS), and official (PUTRNS) inflows. Population growth and the time trend are additional factors likely to positively affect the country's demand for imports. The effect of devaluation, captured by the change in the price of foreign exchange (PFOREX), is introduced in the import function and is expected to exert an adverse impact on the country's propensity to import by raising import prices in terms of local currency. PFOREX and TOT are entered in our regressions separately since they capture the same effect. The ratio of FDI inflow to GDP (FDIR) is added to gauge its effect on imports. A positive and significant coefficient of FDIR implies that FDI promotes imports. The import function is specified as:

$$LIMP = \beta_0 + \beta_1 LGDP + \beta_2 LOPEN + \beta_3 FDIR + \beta_4 LTOT + \beta_5 POPGR_1 +$$

$$\beta_6 LEXPO_{-1} + \beta_7 LTRNSF + \beta_8 PFOREX + U_t \dots (4.4)$$

where: LTRNSF is a logarithm of private plus official transfers and U_t is the stochastic term. The expected signs of the variables in equation (4.4) are specified below:

$$\beta_1, \beta_2, \beta_3, \beta_6, \beta_7, \beta_8 > 0; \beta_4 < 0; \beta_5 > \text{ or } < 0$$

The coefficients of FDIR in the export and import functions are compared to determine the net impact of FDI on external trade.

4.2 METHODOLOGY AND DATA:

4.2.1 TEST FOR STATIONARITY

Following the seminal works of Nelson and Plosser (1982) and the recognition by most macroeconomists that, "most macroeconomic time series variables exhibit a unitary time series structure; the view that most time series economic variables are characterized by stochastic, rather than deterministic, testing for non stationarity of variables has become prevalent in econometrics" (Bodman, 1995). It has recently come to light that the presence of unit roots in economic variables in the regression would yield time dependant results, which may be spurious⁹ unless the variables in the model are cointegrated. Dickey-Fuller (DF) and Augmented Dickey Fuller (ADF) tests have been used to test for stationarity. AD and ADF test are specified as:

$$\Delta X_t = \beta + \psi X_{t-1} + \epsilon_t \dots (4.5)$$

$$\Delta X_t = \beta + \psi X_{t-1} + \sigma T + \epsilon_t \dots (4.6)$$

⁹

"The term spurious results was first coined by Newbold and Granger (1974) to describe the regression results done on levels involving economic time series that "look good" in the sense of having high R squared and significant t statistic, but which in fact are meaning less" (Griffiths, 1993 p 696). The results of spurious regression yield inconsistent OLS estimates if the hypothesis of no cointegration is accepted.

$$\Delta Y_t = \alpha + \rho Y_{t-1} + \sum_{i=1}^K \gamma_i \Delta Y_{t-i} + \epsilon_t \dots (4.7)$$

$$\Delta Y_t = \alpha + \rho Y_{t-1} + \sum_{i=1}^K \gamma_i \Delta Y_{t-i} + \phi T + \epsilon_t \dots (4.8)$$

Where; X_t and Y_t are economic variables at their levels, Δ is a difference operator, K is the lag length, X_{t-1} and Y_{t-1} are lagged values of X_t and Y_t respectively. α and β are constants, σ and ϕ are time trend parameters while Ψ and ρ are coefficients on the lagged terms in equations (4.5) & (4.6) and (4.7) and (4.8) respectively. γ is the coefficient on Y_{t-1} , T is a time trend while ϵ_t is a white noise process, assumed to define a sequence of identically, and independently distributed (IID) random variables with constant first and second moments. The time trend is included to capture trend stationarity. The implication of a variable being stationary with insignificant time trend is that the coefficients β and ρ in equations (4.6) and (4.8) are zero. This is an indication of the absence of a constant time trend. Equations (4.5) and (4.6) depict the DF test with trend and without trend respectively. If $|\Psi| < 1$ (absolute value of 1) in equations (4.5) and (4.6), unit roots hypothesis is rejected, thereby accepting the alternative hypothesis under the assumption of AR(1) autoregressive process. On the other hand if $|\Psi| = 1$, then AR(1) is a random walk with and without trend in (4.5) and (4.6) respectively, implying that the series is non stationary. We utilize Microfit package which produces the t-statistics at 5% level of significance for DF and ADF tests specified above.



Equations (4.7) and (4.8) are modified versions of the DF test referred to as ADF test, with $\Delta Y_{t,i}$ introduced to capture an autoregressive moving average process (ARMA). This is so in the case when the assumption that the error term is a white noise is violated. The choice of the lag length (K) in (4.7) and (4.8) should be large enough to ensure a Gaussian white noise process so as to avoid serial correlation. If $\rho < 1$, then, we reject unit roots with or without trend in (4.7) and (4.8) respectively, otherwise we accept unit roots. Variables which are not $I(0)$ will be differenced until they are stationary.

4.2.2 DIAGNOSTIC TESTS

To come up with results that are consistent with the data, the model has to be subjected to a set of diagnostic tests. In this regard, considerable attention is given to testing for heteroscedasticity, serial correlation, normality, functional form and parameter stability. MicroFit 286 iterative statistical package provides diagnostic test statistics. Normality test will be applied on individual variables using the test of skewness and kurtosis statistics. With regard to the method of analysis adopted, testing for parameter stability is also emphasized.

4.2.3 PARAMETER STABILITY TEST.

It is widely acknowledged in the literature that the presence of structural breaks in the data set may affect the test for unit roots. The presence of structural breaks may

bias the cointegration (stationarity) tests towards accepting unit roots. For detailed discussion of the effects of structural breaks, see Perron (1989). We therefore test for structural breaks in our data series. Since the break periods are not known a priori, the plots of cumulative sum of recursive residuals (CUSUM) for systematic changes and the cumulative sum of squared recursive residuals (CUSUM SQ) for sudden changes are used to identify structural breaks and the respective break period(s). These plots are given by Microfit 286 version 3 statistical package. The critical bounds are constructed at 5% level of significance. Within these boundaries, the existence of structural breaks in the data is rejected. Existence of structural breaks signals leverages (outliers) in the data series. Chow (1960) devised a test called Chow test to test for parameter stability. Given the sample size, it is highly likely that the number of degrees of freedom would not be enough to warrant two sub-sample estimations. Thus, the version of the Chow test that enables an estimation of the before or after structural break samples depending on the one with more observations is adopted. This version of chow test can be stated as:

$$C = \left(\frac{RSS_T - RSS_1}{RSS_1} \right) \left(\frac{T-K}{T_2} \right) \dots (4.1.1)$$

where C is distributed as F statistic, $F(T_2, T_1 - k)$. RSS_T is the residual sum of squares for the model estimated over the whole sample period, RSS is the residual sum of squares over the period T_1 observations; (i.e T_1 is the number of observations before the break period, the one with more observations). T is the total number of observations so that $T_2 = T - T_1$. C is the test statistic for parameter constancy (which also tests for the constancy of the error variance). The null hypothesis of parameter constancy is rejected if the tabulated F is greater than C .

4.2.4 BETA COEFFICIENT TEST

In order to accurately isolate the major determinants of FDI which is the key objective of this paper, we assess the relative strength (influence) of each explanatory variable on the dependant variable (FDI). To achieve this, the beta coefficient¹⁰ test is used and may be formally stated as:

$$\beta_{coeff} = \frac{\beta_x \cdot \sigma_x}{\sigma_y} \dots (7)$$

¹⁰ Beta coefficient is the coefficient estimate from the regression in which the variables have been standardised. The argument behind the use of the beta coefficient lies in the fact that regression coefficients depend on the units of measurement of their respective variables, hence these coefficients can only be comparable if all the variables are expressed in a single unit of measurement. i.e if it is expressed in terms of its standard deviation (See Maddala 1977, p 119). The only shortcoming of this test is that its distribution is unknown and as such it has to be used with caution.

where β coeff is the beta coefficient, β_x is the coefficient of the regressor (X), σ_y and σ_x are the standard deviations of the regressand (Y) and the regressor (X) respectively. This technique is helpful as far as the analysis of the relative strength of the determinants of FDI in Zambia is concerned. This is done by comparing the relative influence of a change in each explanatory variable on FDI after standardizing the units of measurement and holding the influence of other regressors in the equation constant (Maddala 1977).

4.3 DATA AND DATA SOURCES

The data used in this study was compiled from various sources. All the variables, except domestic prices, are in current US dollars. FDI is foreign direct investment while FDIR is FDI expressed as a ratio of gross domestic product (GDP). The FDIR series were compiled mostly from the world table (1995) but also from the Zambia Investment Centre data processing unit. GDP, the inflation rate proxied by the consumer price index, and Zambia's population were compiled from the Central Statistical Office (CSO) publications in Zambia. Private and official inflows (TRNSF) and the Zambia's terms of trade (TOT) were compiled from World Tables (1995).

Quasi money (QM), broad money (M2) the treasury bill rate (TB), the deposit rate (r), Zambia's foreign debt service, per capita income (LPGDP), Zambia's imports

(LIMP) and exports (LEXPO), government deficit expressed as a ratio of GDP (GDEF) were all sourced from the ministry of Finance in Lusaka and the IMF International Financial Statistics (IFS) yearbook (1996). Primary exports were compiled from UNCTAD commodity year book (various issues). The real exchange rate (REX), defined as the nominal exchange rate (EX) adjusted for inflation, was compiled from the ministry of finance data base, Lusaka¹¹. The volatility of the exchange rate (EXVAR) was calculated as a first difference of PFOREX¹².

The Zambia manufacturing real wage rate was compiled from the ILO statistical yearbook. Missing observations were extrapolated based on data from the World Table (1995). The USA wage rate was obtained from the World Table (1995) and the ILO statistical yearbooks. The cost of labour (WG) was calculated as the ratio Zambia's manufacturing real wage to US wage rate. The labour productivity variable was compiled from World Table (1995). Credit to the private sector was computed from Bank of Zambia publications. The London inter bank rate and the US long term bond rate were sourced from the International Financial Statistics Yearbook (1996). Growth rate (GR) in OECD countries was compiled from the OECD country reports. Financial repression (FRP) was calculated following Dooley (1988) approach as:

¹¹ The price of foreign exchange (PFOREX) capturing the effect of devaluation of the host country's currency was calculated as:

$$(REX_t - REX_{t-1})/REX_{t-1}$$

where REX is the real exchange rate of the Zambia kwacha to the US dollar. (See Pain (1995))

¹² See Margot Anderson and Phillips Garcia (1989).



$$FRP = \frac{(1 + r_{libor}) / (1 + r)}{(1 + \ln ex_t - \ln ex_{t-1})}$$

where *libor* is the London inter bank rate, *r* the domestic rate of interest on deposits and *ex* is the nominal exchange rate (Kwacha/Dollar).

CHAPTER 5

5.1 INTERPRETATION OF RESULTS

5.1.1 THE OVERALL VALIDITY OF THE ESTIMATES

Time series data between 1970 and 1995 was used for the empirical estimation of the model. As the first step in ensuring that the results are consistent, considerable attention was given to the assessment of the appropriateness of the overall model. The criteria adopted was based on the analysis of the coefficient of determination (R^2 and adjusted R^2), the F statistic, Durbin-Watson (D.W), the standard error of the overall regression and various diagnostic tests. To ensure that the regression results are not spurious, appropriate tests and data pre-filter techniques were embarked upon before and after the estimation.

The adjusted R^2 (\bar{R}^2) measures the goodness of fit of the estimation. In all the equations estimated the adjusted R^2 is very high with an average of 89%. This indicates that the variables considered in our empirical model of FDI accounts for a substantial variation of the flow of FDI in Zambia. The standard error of the overall regression for all equations are consistent with the results. The F statistic, which measures the overall significance of the parameter estimates permits the rejection of the null hypothesis that

the estimated coefficients (in all the equations) are insignificantly different from zero. There is no evidence of significant autocorrelation since the D.W statistic for all the equations estimated lies within the rejection region except for equation 6. For this equation Cochrane-Orchutt AR(2) method was used to correct for autocorrelation.

The underlying econometric theory assumes that the processes being examined are stationary. Since the violation of this assumption may lead to spurious regression results, we tested for the order of integration of each variable.

5.1.2 TEST FOR STATIONARITY

Tables A1.5 and A1.6 in the appendix show the results of the tests for stationarity and the order of integration. The results of the DF and ADF tests, both with and without trend, show that debt service (DSER), the price of foreign exchange (PFOREX), the exchange rate variability (EXVAR), financial repression (FRP), the growth rates in OECD countries (GR), natural resource endowment (NR), the wage rate (WG) and labour productivity (LP) are integrated of order zero, or $I(0)$, and that inflation (INF), treasury bill rate (TB), per capita GDP (LPGDP), US long term bond rate (USB) and financial deepening (M2R) are integrated of order one, or $I(1)$. However, foreign investment (FDIR), government deficit (GDEF), quasi money (QSM), and private sector credit (PCCR) have mixed results. While the DF test with and without trend indicates that FDIR, QSM, GDEF and PCCR are $I(0)$, the results of the ADF test with and without

trend indicate that these variables are I(1). The variables that have been found to be I(1) have been differenced once to ensure stationarity.

After ensuring that the variables exhibit the required stationarity properties, we embarked on the empirical estimation of the model to isolate the determinants of FDI in Zambia. We then subjected our model to a battery of diagnostic tests to further ensure that the results are consistent with our estimation procedure.

5.1.3 DIAGNOSTIC TESTS

Table 2 below shows the results of the various diagnostic tests computed by MICROFIT 286 (version 3.0) interactive computer program.

TABLE 2: DIAGNOSTIC TEST RESULTS

EQUATION	F VERSION			(LM VERSION)
	SERIAL CORRELATION	FUNCTIONAL FORM	HETEROSCEDASTICITY	NORMALITY
1	.779(.39)	.437(.52)	.595(.45)	.388(.82)
2	.002(.46)	.323(.58)	.007(.94)	.914(.63)
3	.037(.85)	.630(.44)	.020(.89)	.453(.80)
4	.037(.85)	.630(.434)	.020(.89)	.453(.80)
5	.026(.87)	1.289(.27)	.001(.97)	.404(.82)
7	.097(.76)	.498(.49)	.005(.94)	.297(.86)

Equation 6 was estimated by cochrane orcutt ar(2) method and hence there is no output of diagnostic results. Figures in brackets are probabilities at which respective hypothesis could be rejected.

The output enabled us to test for serial correlation, functional form mis-specification (Reset test), normality (Ramsey test based on the test for skewness and Kurtosis) and heteroscedasticity.

The figures in parenthesis are probabilities at which various hypothesis could be accepted. It is evident that the presence of serial correlation is rejected in all equations at 5% significance level. The regression specification test referred to in the table 2 as the test for functional form is used to detect mis-specifications resulting from non linearity in the model. The F statistic for functional form test rejects mis specifications at 5%. Thus, our specified model fits the data series well. Similarly, the null hypothesis of homoscedasticity is accepted against the alternative of heteroscedasticity at 5%. Finally, normality test tests for the distribution of residuals from the regression. The evidence suggests that the error term from all the equations estimated were normally distributed and hence the resulting parameter estimates are efficient and consistent. The CUSUM and CUSUM.SQ tests rejected structural breaks in all our regressions at 5% and hence (Chow test) was not performed as stability was accepted.

5.2 EMPIRICAL RESULTS AND INTERPRETATION.

Table 6 below reports the results of our empirical estimations. The domestic market size was captured by per capita GDP (LPGDP). The coefficient of LPGDPD has

the right sign and is statistically significant at 5% in all the equations. The purchasing power of the population is an adequate measure of the size of the domestic market. This result is consistent with underlying economic theory. Ekpo (1996) and Wang et al (1995) among others found the same results. Some studies have used the per capita income variable to capture the rates of return on investment in developing countries where capital markets are either completely absent or under developed¹³. In this regard, high per capita income implies high rates of return on investment, which may attract FDI.

¹³ See Ekpo A. forthcoming 1996

TABLE 6: EMPIRICAL RESULTS OF THE DETERMINANTS OF FDI IN ZAMBIA

VAR	EQUATIONS						
	1	2	3	4	5	6	7
CQN	.067 (4.91)	.054 (3.98)	.069 (5.79)	.07 (6.03)	.065 (5.61)	.08 (5.72)	.066 (5.22)
PCCRD	.025* (6.19)		0.02* (5.85)	.022* (5.66)		.029* (3.86)	.026* (6.92)
NR	.181* (4.11)	0.091* (5.50)	.13* (5.23)	.13* (5.28)	.13* (5.20)	.047* (3.41)	.07* (3.49)
DSER	-.80* (5.11)	-.61* (3.77)	-.77* (5.64)	-.80* (5.88)	-.78* (5.82)	-.97* (7.75)	-.78* (5.39)
LPGDP D	.053a (2.66)		.05a (2.49)	.05a (2.51)			
EXVAR			-.001* (2.53)		-.0003 (2.54)		
TDB		.001a (2.74)				.001a (2.43)	
GDEFD				-.0003a (1.73)			
INFD		-.0007a (2.74)					
FRP					-.003a (2.26)	-.004* (3.88)	
QSMD		0.004 (1.11)				.267* (4.33)	.19a (2.13)
RBar ²	0.86	0.87	0.90	0.90	0.87	0.90	0.89
F	52.36	29.09	44.1	38.41	38.18	24.83	47.05
S.E	0.023	0.02	0.02	0.02	0.018	.017	0.021
D.W	2.34	1.96	1.92	2.09	1.89	2.17	2.11

NOTE 1% (*), 5% (a) and 10%(b) level of significance, Figures in brackets are t statistics, e # = Equation estimated using cochrane-ocutt ar(2) method. Negative signs has been omitted on the t statistics for DSER, EXVAR, FRP, INFD and GDEFD for brevity.

Per capita income has also been used as a proxy for infrastructural development (Woodward and Rolfe 1993). The reasoning is that economic growth raises the liquidity position of the government sector and the private sector (i.e firms and households). In all

these cases, the overall impact of infrastructure development and rapid economic growth is to improve the investment climate.

The natural resource potential of the host country, captured by NR, carries the expected sign and is statistically significant at 1%. This result concurs with most findings in the literature. Multinational firms tend to locate manufacturing enterprises near the source of raw material inputs, especially, when this consideration outweighs labor and marketing cost. Therefore Zambia's natural resource endowments, particularly mineral resources, should attract FDI.

The production cost variables were not significant as expected. Labor productivity (LP) has a positive effect on FDI but was statistically insignificant at 10%. The wage rate differential (WG) carried a positive sign although insignificant at 10%.

The effect of economic prosperity in FDI home countries (GR) was tested. Although GR assumed a positive coefficient indicating its positive link with FDI, it was statistically insignificant at 10% in our estimations.

Various measures of uncertainty and instability were tested. Most studies have examined the effects of exchange rate instability by focusing on its effects on domestic exports and international competitiveness. In this study, we tested the effect of real exchange volatility (EXVAR) on FDI. EXVAR carries negative coefficients and is

statistically significant at 5% in equations 3 and 5. The volatility of the exchange rate affects FDI through its impact on investment risk and uncertainty. High levels of uncertainty increases the option value (i.e the value of future information) and hence, the opportunity cost of foreign investment. This in turn depresses the expected profitability of foreign investment and thereby adversely affects the inflow of FDI. INFD is statistically significant at 5% with a negative sign. These results confirm the popular view that macroeconomic instability discourages foreign investment by increasing the investment risk premium.

Foreign debt and its associated resource transfer to creditors (DSER) is yet another source of economic and financial instability. The servicing of multilateral debt was used to capture domestic resource transfer to service foreign debt. DSER is highly significant at 1% or higher in all the equations and exerts a substantial negative impact on the inflow of FDI in Zambia. This is reinforced by the negative effect of GDEFD (the ratio of government deficit to GDP) on FDI. The coefficients of DSER and GDEFD indicate that a huge foreign and domestic debt acts a signal for future economic crisis and policy reversals. The ensuing uncertainty in the investment environment adversely effect the inflow of foreign capital.

The opportunity cost of capital, proxied by US long term bond rate, has the anticipated sign on its coefficients albeit insignificant in all the equations in which it appeared. The internal cost of capital was proxied by the government treasury bill rate

(TBD). TBD was statistically significant at 5% in equation 2, and 6. Despite being statistically significant, TBD carried, contrary to our expectations, a positive sign. However, a positive correlation between TBD and FDI concurs with many studies on developing countries (Mackinnon, 1973; Shaw, 1973; Blejer and Khan, 1984; Servén and Solimano, 1992). The findings of these studies have been that private investment in developing countries is not constrained by the cost of domestic credit but by lack of credit.

In view of the above, the effect of credit constraints on FDI in Zambia was tested. The ratio of private sector credit to total domestic credit (PCCRD) was used to capture credit to the private sector. PCCRD was highly significant and exerts a positive impact on the flow of FDI in Zambia as expected. Since foreign investors are said to supplement their working capital by borrowing from domestic financial markets (Wang et al, 1995), increasing the amount of credit to the private sector would attract FDI.

The impact of repressive financial policies on FDI in Zambia was tested. FRP, as expected, took a negative sign in all the equations it appeared, and was statistically significant at 1% in equation 6 and at 5% in equations 5. The impact of financial deepening (M2R) on the inflow of FDI was also tested. M2RD was statistically insignificant and assumed a negative coefficient. However, the measure of the depth of financial intermediation (QSMD) was highly significant in all the equations it was introduced. Repressive financial policies adversely affects foreign investment, deepening

financial intermediation would improve domestic resource mobilization and augment the stock of domestic credit.

Having reviewed the empirical results, we wish to isolate the major determinants of FDI in Zambia by analyzing the relative influence of each explanatory variable on FDI. Table 7 gives the standardized coefficients for each explanatory variable referred to as beta coefficients.

TABLE 7: BETA COEFFICIENTS FOR SELECTED EQUATION

VARIABLES	EQUATIONS					
	2	3	4	5	6	7
PCRRD		0.458*	0.452*		0.534*	0.611**
OPEN					0.774***	
NR	0.523***	0.604***	0.609***	0.609***	0.703**	0.997*
DSER	0.425**	0.462**	0.479**	0.467**	0.467	0.482***
LPGRPD		0.259	0.261			0.316
TBD	0.356*					
GDEFD.		0.195	0.204			
FRP				0.169		
QSMO					0.171	
EXVAR				0.231*		

The signs on the coefficients are disregarded when comparing and ranking the variables according to their relative impact on FDI. (), (**) and (***) denote first, second and third most influential variables in each equations, respectively.*

The Natural resource variable NR appears to be the most important determinant of foreign investment in Zambia. The second variable with the highest relative influence on the flow of FDI in Zambia comes out to be the country's capacity to service its foreign

debt (DSER). This variable ranks second in 2, 3, 4, 8 and 5. Large and unsustainable debt service obligations create uncertainty about future economic policies and the government's capacity to stabilize the economy. Zambia is a heavily indebted country, its per-capita foreign debt stock is among the highest in the world. The capacity of the government to service its foreign debt and maintain macroeconomic stability will be of crucial importance in creating a less uncertain investment environment.

The third most important determinant of FDI in Zambia is lack of credit. Credit constraint ranked second in equations 7 and third in equations 3 and 5. Thus, increasing the volume of total domestic credit and the share taken up by the private sector would attract foreign investment.

Finally, economic growth comes forth in attracting foreign investment in Zambia. Economic growth can increase foreign investment in the following ways. Economic growth can increase foreign investment, at least, in the following ways. First, since economic growth improves the liquidity position of domestic firms, it is likely to facilitate joint ventures between domestic and foreign firms. In this way, more foreign capital is likely to flow in the economy. Second, economic growth improves the liquidity of the economy and raises investments in infrastructure thereby attracting more inflows of foreign investment. Third, economic growth widens the size of the domestic market and increases investment. Our results indicate that the size of the domestic market is a significant determinant of FDI in Zambia.

debt (DSER). This variable ranks second in 2, 3, 4, 8 and 5. Large and unsustainable debt service obligations create uncertainty about future economic policies and the government's capacity to stabilize the economy. Zambia is a heavily indebted country, its per-capita foreign debt stock is among the highest in the world. The capacity of the government to service its foreign debt and maintain macroeconomic stability will be of crucial importance in creating a less uncertain investment environment.

The third most important determinant of FDI in Zambia is lack of credit. Credit constraint ranked second in equations 7 and third in equations 3 and 5. Thus, increasing the volume of total domestic credit and the share taken up by the private sector would attract foreign investment.

Finally, economic growth comes forth in attracting foreign investment in Zambia. Economic growth can increase foreign investment in the following ways. Economic growth can increase foreign investment, at least, in the following ways. First, since economic growth improves the liquidity position of domestic firms, it is likely to facilitate joint ventures between domestic and foreign firms. In this way, more foreign capital is likely to flow in the economy. Second, economic growth improves the liquidity of the economy and raises investments in infrastructure thereby attracting more inflows of foreign investment. Third, economic growth widens the size of the domestic market and increases investment. Our results indicate that the size of the domestic market is a significant determinant of FDI in Zambia.

5.3 THE NET EFFECT OF FDI ON TRADE

The likely impact of FDI on Zambia's trade account was gauged by estimating the import and export functions specified in chapter 4¹⁴. The results of the estimations are summarized in tables 5.1 and 5.2. We expressed the export and import equations as functions of the openness of the economy (LOPEN), the country's income proxied by (LGDP), the ratio of FDI to GDP (FDIR), devaluation (PFOREX), the terms of trade (LTOT), and the lag of exports (LEXPO₋₁). Economic growth in the OECD countries was introduced in our export function to capture the effect of changes in income in the importing region. The Time trend was added in both equations to improve the fit. Results from the estimation of the export function are first discussed. The net effects of FDI on trade is gauged by comparing the effect of FDI on imports and exports.

5.3.1 THE EFFECT OF FDI ON EXPORTS

The results of the estimated export function are summarized in table 5.1. The specified export function recorded a good fit as can be seen from the high R^2 . The coefficients of the explanatory variables tested jointly are all statistically different from zero as indicated by the highly F statistic. Furthermore, there is no evidence of significant diagnostic mis specifications, except for equations 3 and 6 where autocorrelation was

¹⁴ For this model, we apply OLS procedures to test for the impact of FDI on imports and exports in accordance with the empirical literature.



noticed (See table A1.7 and A1.8 in the appendix). For these equations, cochrane orchut estimation method was used to correct for autocorrelation. The plots of CUSUM and CUSUM.SQ showed no evidence of structural breaks in the data series.

TABLE 5.1 THE IMPACT OF FDI ON EXPORTS:

EQNS	EQUATIONS					
	1	2	3	4	5	6
CON	-0.02 (-0.03)	-0.61 (-1.82)	-0.28 (-0.50)	0.12 (0.23)	-0.54 (-1.63)	-4.07 (-4.62)
LOPEN	0.82 (8.18)	0.98 (10.62)	1.17 (19.17)	1.11 (12.01)	1.15 (11.79)	1.17 (18.21)
LGDP	1.05 (11.21)	1.21 (13.78)	1.29 (25.37)	1.18 (16.30)	1.19 (15.08)	1.29 (23.78)
FDIR	1.46 (2.36)	1.52 (3.07)	1.51 (6.37)	1.24 (3.51)	1.43 (3.85)	1.51 (5.85)
PFOREX	0.14 (2.27)	0.001 (2.96)	.001 (3.32)	0.001 (1.95)		.001 (s.02)
LTOT				0.15 (2.18)	0.10 (1.43)	
LEXPO(-1)		-0.26 (-3.40)	-0.34 (-6.01)	-0.33 (-5.17)	-0.36 (-5.18)	-0.33 (-5.61)
TIME				0.01 (-2.02)	-0.01 (2.71)	-.007 (-2.1)
GR			0.02 (3.42)			.021 (2.79)
POPGR(-1)	-12.08 (-2.24)	-13.79 (-3.20)				
R ²	0.89	0.93	0.98	0.97	0.96	0.98
RBAR ²	0.86	0.91	0.97	0.96	0.95	0.97
F	8.85	40.11	82.82	71.51	69.82	74.24
S.E	0.10	0.075	0.04	0.05	0.06	.042
D.W	2.24	1.62	2.18	2.00	1.99	2.10
H		none	none	-0.01	0.015	none

Equations 3 and 6 are estimated by Cochrane Orcutt method. The figures in brackets are *t* statistics.

The estimation results indicate the existence of a positive and significant link between the level of exports and the degree of openness of the economy, the growth in the country's output, the inflow of FDI, the terms of trade, the economic prosperity in the importing region and devaluation of the currency in the host country. The growth in population has a negative and significant impact on Zambia's export performance. This is because as the population grows more resources have to be diverted to the satisfaction of domestic demand. These results concurs with those of O'Sullivan P,T (1993) for Ireland and Wang (1995) on China, but contrary to those on Hungary. Since Zambia's exports are predominantly primary commodities, (minerals and agricultural products), an attempt was made to dis-aggregate total exports into primary and manufacturing exports.

$$\begin{aligned} \text{LEXMNU} = & 4.28 + 0.84 \text{ LOPEN} + 1.11 \text{ LGDP} + 2.33 \text{ FDIR} - 0.867 \text{ LTOT} \\ & (3.85) \quad (4.84) \quad (7.29) \quad (2.31) \quad (-2.20) \\ & + 0.093 \text{ GR}_{-1} \\ & (4.04) \end{aligned}$$

$R^2 = 0.89$ $R\text{bar}^2 = 0.85$ $F(5,15) = 23.64$ ($.000$) $S.E = .04$ $D.W = 2.17$. where LEXMNU is a logarithm of exports of manufactured goods.

The results of the effect of FDI on the export of manufactured goods are presented above. The explanatory variables account for about 89% of the total variations in manufactured exports. The overall model is statistically significant at more than 99% confidence level. The above results indicate that foreign direct investment is positively and

significantly linked to manufactured exports. A 1% rise in FDIR would induce a 2.33% increase in manufactured exports.

The effect of FDI on primary exports was also investigated. Cochrane Orcutt AR(2) estimation technique was used to ensure that consistent parameter estimates were obtained. The estimations fit the data well and the F statistic rejects the hypothesis that all the coefficients jointly tested are different from zero. The independent variables explains about 94% of the variations in primary exports. The results of our empirical estimation are reported below.

$$\begin{aligned} \text{LPR} = & 1.20 + 0.616 \text{ LOPEN} + 0.741 \text{ LGDP} + 0.74 \text{ FDIR} + 0.033 \text{ GR}_1 \\ & (4.09) \quad (11.05) \quad (19.16) \quad (1.83) \quad (4.68) \\ & + 0.001 \text{ PFOREX} \\ & (4.11) \end{aligned}$$

$R^2 = 0.94$ $R\text{bar}^2 = 0.90$ $F(5,19) = 23.39(.000)$ $S.E = .066$ $D.W = 2.22$ where LPR is a logarithm of primary exports.

As shown above, the coefficient of FDIR in the primary export equation is weakly significant compared to the manufactured exports equation. This indicates that FDIR is likely to boost the export of manufactured goods more than the export of primary goods. Much of the primary exports are from the mining sector and this sector was relatively closed to foreign investors until the liberalization of the mining sector in 1995/96.

Therefore, not much foreign investment was directed to the mining sector and, until recently, the agricultural sector contributed marginally to primary exports.

5.3.2 THE EFFECT OF FDI ON IMPORTS

The import function estimation results are summarized in table 5.2. The import equation equally recorded a good fit with a high explanatory power. The overall regression is statistically significant and both the D.W statistic and Durbin Watson H statistic gave no evidence of significant autocorrelation. The diagnostic tests are all consistent with the standard OLS estimation requirements. In terms of parameter constancy, the plots of CUSUM and CUSUM.SQ showed no evidence of structural breaks in the data series.

The results of the impact of FDI on imports are summarized in table 5.2 below.

TABLE 5.2: THE IMPACT OF FDI ON IMPORTS

EQNS	EQUATIONS						
	LIMP			LINTINP	LCAPINP	LMIMP	
	1	2	3	4	5	6	7
CON	-6.02 (-4.26)	-1.72 (-2.77)	-1.61 (-2.36)	38.95 (7.41)	-0.096 (-0.28)	-1.99 (-2.44)	-0.33 (-0.42)
LOPEN	1.18 (8.71)	0.65 (5.93)	0.74 (6.21)		2.20 (3.86)	0.50 (4.40)	0.54 (4.40)
LGDP	0.92 (8.71)	0.63 (6.42)	0.75 (7.75)		1.01 (2.24)	0.44 (3.27)	0.56 (5.21)
FDIR	1.63 (-1.94)	-1.67 (-3.17)	-1.51 (-3.31)	24.04 (4.68)	2.25 (0.96)	-2.08 (-2.41)	-2.20 (-2.82)
PFOREX	-0.18 (-2.14)			-0.32 (-4.07)			
LTOT			-0.16 (-1.90)	-5.89 (-5.29)			-0.22 (-3.67)
TIME		0.02 (7.24)	0.017 (2.92)		0.078 (3.49)	0.017 (3.44)	
LEXPO(-1)		0.50 (5.61)	0.47 (5.62)	3.34 (4.42)		0.57 (5.13)	0.43 (4.55)
POPGR(-1)	16.46 (2.27)						
OFFTRNS					.00004 (2.00)		1.*10 ⁻⁶ (1.53)
R ²	0.85	0.94	0.96	0.91	0.95	0.89	
RBAR ²	0.81	0.92	0.94	0.80	0.93	0.85	0.88
F	21.13	57.10	57.28	8.59	53.04	23.80	25.27
S.E	0.13	.084	0.07	0.77	0.41	0.10	0.09
D.W	2.13	1.80	1.98	2.11	2.14	1.99	1.71

Figures in brackets are *t* statistics LMIMP=logarithm of imported consumer goods, LCAPINP= logarithm of capital input imports, LINTINP=logarithm of intermediate capital inputs and LIMP is logarithm of total imports.

The results indicate that LGDP, LOPEN, POPGR(-1) and the TIME trend are positively related to imports. It is also noted that the capacity to import largely depends

on previous year's export revenues (LEXPO). Other sources of foreign exchange such as official transfers were considered but came out to be insignificant in the model. The terms of trade is negatively related to imports as expected. The results show that FDI tends to reduce Zambia's imports. On average, a 1% increase in FDIR induces a 1.61% reduction in import. In view of this result, an attempt was made to test the impact of foreign investment on imports of consumer goods, and intermediate and capital goods. In these equations, FDIR is statistically significant at 5% and carries a negative coefficient. This result suggests that FDI is import substituting. A 1% increase in the inflow of FDI induces a 2.5% fall in the imports of consumer goods.

Equations 4 and 5 show the effects of FDI on the imports of intermediate and capital inputs. In these equations, a one year lag was introduced to account for investment lags. FDI carries a positive coefficient in both equations, although only significant in equation (4). The interpretation of this result is that since the intermediate goods sector is not well established in Zambia, intermediate inputs will have to be imported.

5.3 4 OVERALL NET EFFECT OF FDI ON THE TRADE ACCOUNT.

The comparison of the effect of FDI on primary exports and exports of manufactured goods clearly shows that both categories of exports increase with foreign investment. However, FDI is likely to promote more exports of manufactured goods than

those of primary products. The empirical results of the effect of foreign investment on Zambia's imports show that foreign investment reduces significantly the imports of consumer goods.

The coefficient of the FDIR in the aggregate export function is positive with an average coefficient of 1.45 and negative in the import function with the coefficient of 1.61, the net effect of FDI on the trade account is potentially positive in Zambia. The comparison of these coefficients illustrates that FDI is more import substituting than export promoting.

CHAPTER 6

6.0 SUMMARY, POLICY IMPLICATIONS AND CONCLUSION

6.1 SUMMARY

This thesis has examined the factors that influence FDI flows in Zambia and analysed the effects of FDI on Zambia's trade balance using one-equation econometric models of FDI, exports, and imports. The empirical model of FDI 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 macroeconomic determinants of FDI in Zambia.

6.2 POLICY IMPLICATIONS AND RECOMMENDATIONS

Natural resources have always attracted FDI. Zambia is endowed with relatively abundant natural resources, it is one of the largest world producers of copper. In addition

to mineral resources, Zambia has large amounts of uncultivated arable lands and water resources. The recent decision by the government to liberalise the mining sector and privatise the copper mines has attracted a lot of foreign investors' interest. A liberal policy toward the exploitation of Zambia's natural resources will attract large inflows of FDI.

The debt service ratio to exports captured policy uncertainty. This variable was found to exert a substantial influence on the flow of foreign investment in Zambia. Zambia's foreign debt is a major constraint to its long-term economic growth. Debt reschedulings and forgiveness as well as foreign investment will be necessary to relieve the economy from this constraint in the short and medium term. This, in turn, will require that the government maintains its commitment to its structural adjustment reforms and implements the policy reforms needed to stimulate growth of the country's productive capacity.

Lack of credit constrains the flow of foreign investment in Zambia. The contractionary monetary policy that Zambia embarked upon to maintain macroeconomic stability has adversely affected the flow of real bank credit to the private sector. A tight monetary policy that is maintained for a long period of time will severely reduce investment. The implication therefore is that the government budget deficit which is behind the growth of money supply should be brought down and kept low. Furthermore, since the stock of credit is closely associated with the depth of financial intermediation,

developing equity and capital markets is necessary for increasing the amount of domestic credit. The creation of the Lusaka Stock exchange in 1994 is an important initial step taken by the MMD government in developing capital markets and improving financial resource mobilization.

Repressive financial policies that keep interest rates below their market clearing levels impose limits on domestic resource mobilization and exacerbates private sector credit constraints. Similarly, maintaining negative real interest rates implies that capital is costless and there are no incentives for firms to use their existing capital stock efficiently. Thus, the liberalisation of interest rates is likely to enhance resource mobilization, improve financial intermediation and the overall efficiency of investment.

As already alluded to, maintaining macroeconomic stability is crucial in creating a conducive investment climate. Our empirical analysis shows great sensitivity of foreign investment to economic and financial instability. Fixed investment is irreversible and that uncertainty arising from macroeconomic instability would hamper the flow of foreign capital at least in the short and medium term. Large fiscal deficits financed by borrowing from the banking system have been the primary source of macroeconomic instability in Zambia. Accordingly, the government should control public expenditure, improve revenue collection so as to reduce its fiscal deficits.

6.3 CONCLUSIONS.

In interpreting the results of this study and assessing its policy implications one should be aware of its limitations. The fact that adhoc models (models not derived from first principles) have been used to analyse the determinants of FDI in Zambia is an important limitation of this study. Developing appropriate simultaneous equation models of FDI would enable more explanatory variables to be considered and reduce the problem of simultaneous and omitted variable bias. Furthermore, there is the problem of poor data quality. As noted by Kholdy (1995), data compiled in most developing countries, including Zambia, is inaccurate, and may therefore bias the empirical results. Despite these limitations, the results are consistent with the underlying theory of FDI, the recent experience of Zambia and other empirical studies in the literature. The study therefore sheds some light on why FDI flows have remained low in Zambia and how higher FDI inflows could be attracted.

Future research on FDI in Zambia 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 Zambia. Second, with regard to the effects of FDI on trade, future research should focus on the analysis of spill-over effects associated with the presences of FDI in Zambia. Furthermore, in terms of analyzing the effects of regional integration on trade and FDI,

a cross country study covering the COMESA region would be useful. Finally, research on the impact of FDI on capital formation, productivity and growth would be valuable.

APPENDICES

APPENDIX 1

TABLE A1.5 STATIONARITY TEST FOR VARIABLES ON LEVELS

VAR	DF		ADF	
	WITH TREND	WITHOUT TREND	WITH TREND	WITHOUT TREND
FDIR	-4.5509 (-2.9850)	-4.2749 (-3.6027)	-2.7002 (-2.9907)	-3.0017 (3.6119)
LPGDP	-0.99513 (-2.9850)	-1.6477 (-3.6027)	-1.2791 (-2.9907)	-2.6400 (-3.6119)
DSER	-4.7835 (-2.9850)	-5.2634 (-2.950)	-3.6956 (-2.9007)	-4.1179 (-3.6119)
NR	-3.2779 (-2.9850)	-3.3610 (-3.6029)	-3.9766 (-2.9907)	-3.9330 (-3.6119)
INF(-2)	-1.9067 (-2.9850)	-2.4245 (-3.6027)	-2.0026 (-2.9907)	-3.2564 (-3.6119)
EXVAR	-5.8743 (-2.9850)	-5.7424 (-3.6027)	-5.6715 (-2.9907)	-5.6333 (-3.6119)
PFOREX	-3.8549 (-2.9850)	-3.7835 (-3.6027)	-3.7475 (-2.9907)	-3.6654 (-3.6119)
LP	-3.4026 (-2.9850)	-2.9650 (-3.6219)	-4.3711 (-2.9907)	-3.2754 (-3.6331)
WG	-5.4322 (-2.9850)	-5.3322 (-3.6219)	-3.7116 (-2.9907)	-3.6796 (-3.6119)
GDEF	-4.1556 (-2.9850)	-4.8594 (-3.6219)	-1.7754 (-2.9907)	-2.3012 (-3.6119)
QSM	-3.7335 (-2.9850)	-4.1451 (-3.6027)	-1.9488 (-2.9907)	-2.4144 (-3.6119)
FRP	-6.6879 (-2.9850)	-6.5477 (-3.6027)	-4.5603 (-2.9907)	-4.4850 (-3.6119)
PCCR	-36.9761 (-2.9850)	-34.4890 (-3.6029)	-1.8205 (-2.9907)	-1.7031 (-3.6119)
TB	-1.6789 (-2.9850)	-2.8636 (-3.6027)	-1.3520 (-2.9907)	-2.6426 (-3.6119)
USB	-1.3420 (-2.9850)	-1.2546 (-3.6027)	-1.8028 (-2.9907)	-1.6854 (-3.6119)
GR	-3.3934 (-2.3934)	-3.5002 (-3.6027)	-4.1376 (-2.9907)	-4.3308 (-3.6119)

TABLE A1.6 TEST FOR STATIONARITY

VARIABLES	ORDER OF INTEGRATION	DF		ADF	
		WITHOUT TREND	WITH TREND	WITHOUT TREND	WITH TREND
FIRD	1	-5.9005 (-2.9907)	-5.7630 (-3.6119)	-4.7171 (-3.6219)	-4.6713 (-3.6219)
USBD	1	-5.4269 (-2.9907)	-5.2955 (-3.6119)	-4.6894 (-2.9970)	-5.5953 (-3.6219)
QSMD	1	-8.7543 (-2.9907)	-8.6119 (-3.6119)	-7.5933 (-2.9970)	-7.6957 (-3.6219)
M2RD	1	-5.5436 (-2.9907)	-6.0553 (-3.6119)	-2.9883 (-2.9970)	-3.7049 (-3.6219)
PCRRD	1	-49.8869 (-2.9907)	-47.6852 (-3.6119)	-5.6442 (-2.9970)	-5.9120 (-3.6219)
GDEFD	1	-9.0731 (-2.9907)	-9.0127 (-3.6119)	-4.8546 (-2.9970)	-4.8463 (-3.6219)
INFD	1	-4.6073 (-2.9907)	-4.5465 (-3.6119)	-7.5723 (-2.9970)	-7.4502 (-3.6219)

Values in brackets are critical t statistic calculated at 5% significance level. If observed value is greater than the t critical in brackets, we accept stationary with trend and without trend respectively. Note that the DF and ADF tests are less powerful if a variable has a significant trend (Maddala, 1992), this often leads to mixed results. The rest of the variables not appearing in table A1.8 are stationary on levels.

TABLE A1.7 DIAGNOSTIC TESTS FOR EXPORT MODEL

EQUATION	F VERSION			LM VERSION
	SERIAL CORRELATION	FUNCTIONAL FORM	HETEROSCEDASTICITY	NORMALITY
1	.374(.55)	.523(.55)	.158(.70)	.001(1.00)
2	.309(.59)	.002(.97)	.064(.80)	.002(.96)
3	.308(.59)	.001(.97)	.064(.80)	.643(.73)
4	.298(.60)	.178(.68)	.082(.78)	2.71(.26)
5	.202(.20)	.196(.66)	.241(.63)	1.41(.63)
6	.849(.38)	1.21(.29)	.196(.66)	3.26(.11)

TABLE A1.8 DIAGNOSTIC TESTS FOR THE IMPORT MODEL

EQUATION	F VERSION			LM VERSION
	SERIAL CORRELATION	FUNCTIONAL FORM	HETEROSCADESTICITY	NORMALITY
1	.128(.73)	.105(.75)	.059(.81)	.724(.70)
2	.309(.59)	.001(.97)	.064(.80)	.644(.73)
3	.259(.62)	2.01(.18)	.015(.90)	.121(.94)
4	.607(.44)	.122(.73)	.705(.41)	.753(.39)
5	.468(.51)	.241(.63)	2.32(.14)	2.38(.30)
6	.024(.88)	3.75(.07)	.158(.70)	.693(.71)
7	.123(.66)	4.14(.07)	.030(.87)	.337(.84)

Figures in brackets are probabilities at which the null hypothesis could be rejected.

FIG 2: DOMESTIC CREDIT IN ZAMBIA
(1965-1996)

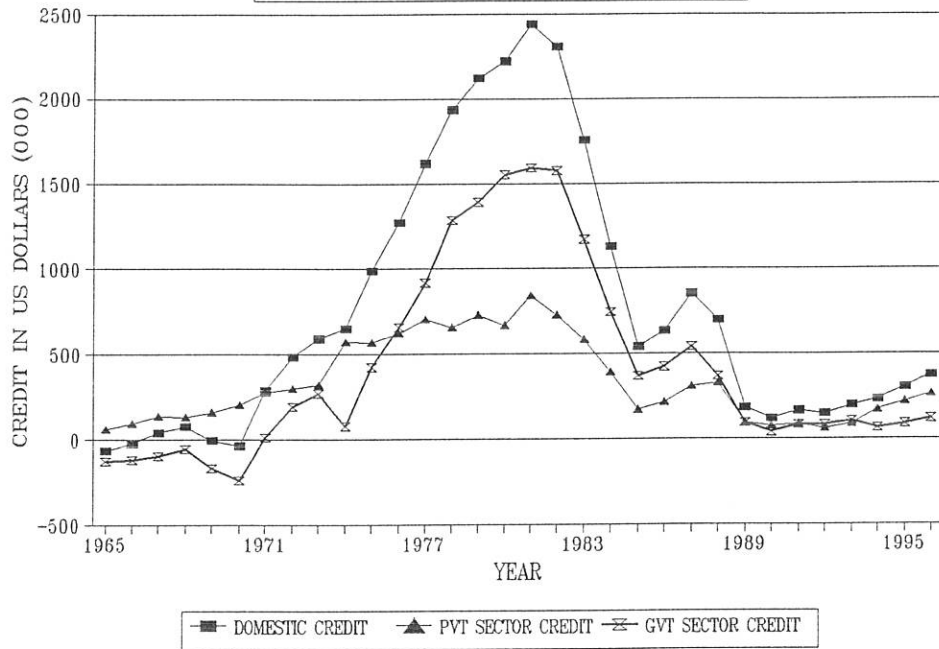


FIG 3: SAVINGS & INVESTMENT IN ZAMBIA
(1965-1995)

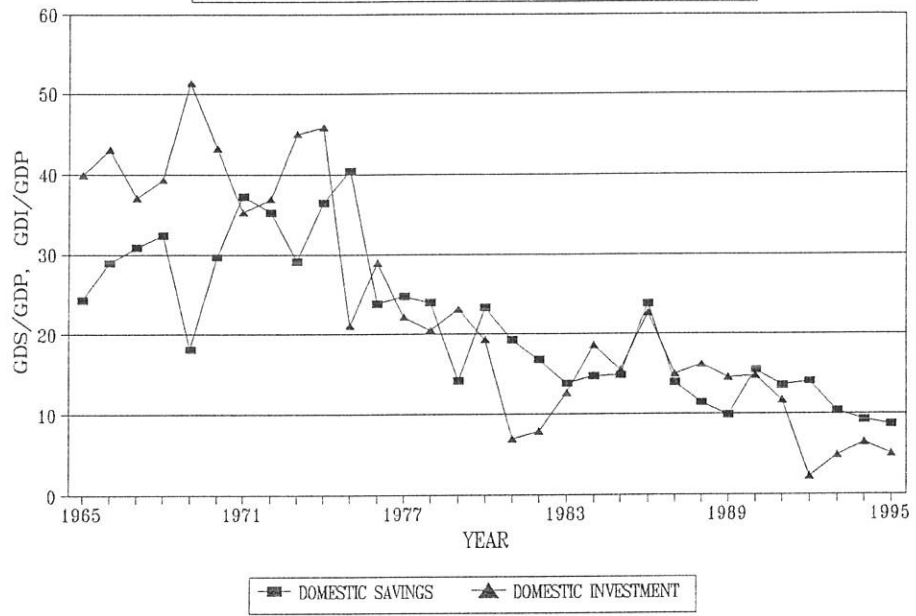
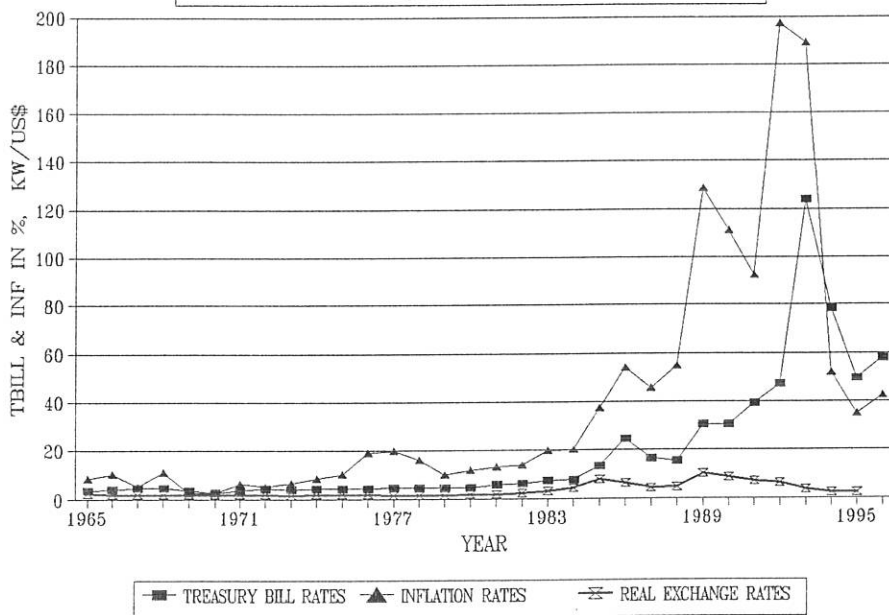


FIG 4: INTEREST, INFLATION & EXCH.RATES
(1965-1996)



BIBLIOGRAPHY

Adam C. (1994), "Financial liberalization and inflation dynamics": Evidence from Zambia, CSAE, Oxford.

Ade S. Olomola (1994), "Financial liberalization and economic growth under structural adjustment in Nigeria", *AJEP* vol 1, Number 1, June.

Agarwal J. (1980), "Determinants of FDI: A Survey", *Weltwirtschaftliches Archivs*, vol 116, pp 739-773.

Aliber R.Z. (1978), Exchange, risk and corporate International Finance, London, Macmillan.

Anthony Myrvin, Land Andrew J, Hughes Halet (1990), "Capital flight Estimates" from Developing Countries, **MIMEO**.

Aiyi I.S (1992), "An Economic Analysis of Capital Flight from Nigeria", World Bank Working Paper, WPS 993, World Bank, Washington DC, USA

Bas van A (1996), " The Impact of the Single Market Programme on Trade and Investment In European Union", Journal of World Trade, vol 30, number 6, Geneva

Blejer M I and Khan M S (1984) " Government Policy and Private Investment in Developing Countries, IMF Staff Papers, vol 31, Washington DC.

Bodman M P (1995), "National Savings and domestic investment in the longterm: Time series evidence from OECD", International Economics Journal, vol 9, H2, Summer.

Burgenmeuer & J.L. Macchielli (eds.), Multinationals and Europe 1992, Strategies for future, London, Routledge.

Caves R.E. (1989), "Exchange rate movements and FDI in the United States", in D.B. Andretsch and M.P. Claudon (eds.), The Internationalization of US markets, New York, pp 199-228.

Caves Richard E (1993), "Japanese investment in United States:Lessons for economic analysis of foreign investment", *The World economy*, vol 16, No 3, Blackwell publishers, Oxford, U.K.,USA.

Charkravty S (1961) "Structural Studies of International Capital Movements, *Economica Internazionale* vol 14.

Chow J (1960) "Test for Equality Between Sub Sets of Coeffieicients on Two Linear Regression Models," *Econometrica*.

Coughlin C., J. Terza & Arromdee (1991), "State characteristics of location of FDI with the United States", *Review of Economics and Statistics*, November.

Dickey D.A, Jansen D.W and Thornton D.L (1994), "A Primer of Cointegration with an Application to Money and Income", in Rao, Cointegration for Applied Economists, MacMillan, UK.

Dickey D.A and Fuller W.A (1979), "Distribution of Estimates for Autoregressive Time Series with a Unit Root", *Journal of American Statistical Association*, vol.74 pp 427-31.

Donning J. (1989), Transnational Corporations and the growth of Services, New York, UNCTC.

Dooley M.P (1988), "Buy Backs and the Market Valuation Of External debt", IMF Staff Paper, Washington DC, IMF.

Ekpo. A (1996), "Foreign Direct Investment in Nigeria": Evidence from time series Data. Forthcoming.

Spitaller Erich (1971), "A survey of recent quantitative studies of long-term capital movements", IMF staff papers, vol.18 number 1, Washington.

Faini, Ricardo & Jaimi De melo (1990), "Adjustment, Investment and the Real Exchange Rate in Developing Countries", Economic Policy, A European Forum (ii), October, PP 491-519.

Froot K A (1991), "Japanese Foreign Direct Investment", NBER Working paper No 3737, National Bureau of Economic Research, Cambridge, UK.

Froot K.A. & J.C. Stein (1991), "Exchange rates and FDI: imperfect capital market approach", Quarterly Journal of Economics. Vol 106, UK



Fry M. J (1993), "FDI in a Macroeconomic Framework, Finance, Efficiency, Incentives and Distortions", World bank working paper, WPS 1141, World Bank, Washington DC.

Gary Hubfbaurer, Danus lakdawalla and Arup Malani (1994) "Determinants of Foreign Direct Investment and its Connection to TRADE", Unctad Review, United Nation, New York.

Griffiths W.E (1993) Learning and Practising Econometrics, New York, USA.

Giorgio R (1973) "Theories of the Determinants of Foreign Direct Investment", IMF Working Paper, Vol xx number 2, Washington DC, USA

Goldeberger L S and Kolstad D C (1995) "Foreign Direct Investment, Exchange Rate Variability and Demand Uncertainty", International Economic Review, Vol. 36.

Granger C.W and Newbold P (1974) "Spurious Regression in Econometrics, Journal of Econometrics, vol.3.

Hennart J K and Park Y R (1992) "Location, Governance and strategic determinants of Japanese manufacturing investment in USA", Working Paper, College of Commerce and Business Administration, University of Illinois [Campaign IL]

Hooshang A and weiping W (1994) " Foreign Direct Investment in Developing Countries" *Journal of Developing Areas*, New Brunswick.

I.A.S (1995) "The performance of the Agricultural Sector in Zambia", Institute for Economic and Social Research, University of Zambia, Lusaka, Zambia.

IMF International Financial Statistics, Various Issues, IMF Washington DC, USA

Jack D G and Mariusz (1995) "Trends in private investment in developing countries", *International Financial Corporation (IFC) Working Paper*, World Bank, Washington DC.

Jaspersen Fredrick Z, Anthony A Aylward, and Mariusz A Simlinski (1995) "The Trends in Private Investment in Developing Countries", *IFC Working paper 328*, World Bank USA.

Khody, S (1995), "Causality between Foreign Investment and Spillover efficiency", *Applied Economic Letters*, number 27, Capman and Hall UK.

Kindleberger C P (1970) ed., "The International Corporation": A Symposium.

Kogut B. & S.J. Chang (1991), "Technological capabilities and FDI in United States",
Review of Economics and Statistics, vol 75.

Kojima K. (1978), Direct Foreign Investment: A Japanese model of Multinational
Business Operations, Praeger, New York.

Kojima and T. Ozawa, (1973) "Towards a theory of industrial restructuring and dynamic
corporative advantage", Hitotsubashio Journal of Economics, vol 26.

Krainer (1967) "Resource endowment and FDI", Journal of Finance vol.22, UK.

Kreger J (1994) " Capital Inflows: Globalisation of production and Financing
Development, UNCTAD Economic Review, New York.

Mackinnon R (1973) Money and Capital in Economic Development, Brookings
Institution, Washington DC.

Margus Blomstrom (1983) "Foreign Investment and spill over efficiency in underdeveloped
countries", World development Report.

Goldberg Linda S and Kolstad Charles (1995), "FDI, Exchange rate variability and demand uncertainty", *International Economic Review*, vol 36, No 4.

Loree D.W & Guisinger S.E, (1995) "Policy and Non Policy Determinant of US FDI", *Journal of International Business Studies*, Vol 20 number 2, Second Quarter, UK.

Maddala G S (1977) *Econometrics*, New York, Mcgraw Hill Inc.

Maddala G S (1992) Introduction to Econometrics (2nd e.d), MacMillan, New York USA.

Margot Anderson and P Garcia (1989) " Exchange Rate Variability and its Effects on Trade" *American Journal of Agriculture economics* vol 71 number 3.

Martin A (1972) Minding their own business: Zambia's struggle against Western control, London.

Moore M (1993) "Determinants of German manufacturing direct investment 1980-1988" *Review of World Economics*, Brand 129, *Weltwirtschaftliches Archiv*

Mwanza A M (ed) (1994) Structural Adjustment in the SADDC, SAPES Harare, Zimbabwe.

Mwanza A M (1992), "Structural adjustment in Tanzania and Zambia", SAPES Trust Magazine, Harare.

Nelson L R and Plosser C I (1982) " Trends and Random walks in Macroeconomic Time Series, *Journal of Monetary economics*, September.

OECD (1992) " Economic report" vol.52, New York, USA.

O'Sullivan Patrick J. (1993), "An Assessment of Ireland's Export Led Growth Strategy via FDI", *Review of World Economies*, Brand 129, UK.

Ozawa T. (1991), "Japan in a new phase of multinationalism and industrial upgrading: Functional interaction of trade, growth and FDI", *Journal of World Trade*, vol 25,.

Ozawa T. (1991), "Japanese multinationals and 1992" in Scapulanda B A.E. and E.J. Mauer (1969), The determinants of US Direct investment in the EEC, *American Economic Review*, 59, New York.

Pain N,(1993), "An Econometric Analysis of Foreign Direct Investment in United Kingdom", *Scottish Journal of Political Economy*, Vol 40, number 1, UK.

Perron P (1988) " Trends and Random Walks in Macroeconomic Time Series, Further Evidence from a Now Approach" *Journal of Economics, Dynamics and Control*, June-September.

Rao B.B (1994) "Cointegration for Applied Economists", USA Rao B.B (ed) Cointegration for Applied Economists, USA.

Ray E. (1988), "The determinants of FDI in United States,1979-85" in R.C. Feenstra (ed.), Trade Policy for International Competitiveness, Chicago, University of Chicago press, USA.

Rember G.L., H. Crockellel, M. Emerson & G. Gillians Hamono (1973), *Private foreign investment in development*, London, Clarendon press.

Scaperlanda A E and Bolough (1983) "Determinants of US Direct Investment In the EEC Revisited, *European Economic Review*, vol 21.

Serven L, . & A. Solimano (1992), "Private investment and macroeconomic adjustment, a survey", *World Bank Research Observer*, 7, No 1, pp 95-114.

Seshamani V (1995) "Promotion of Direct Investment in Zambia, UNECA, Addis Ababa, Ethiopia, MIMIEO.

Shaw E (1973) *Financial Repression in Economic Development*, New York, Oxford University Press.

Soderstein BO (1992) International Economics, Macmillan publishing ltd, USA.

Swedenborg Birgitta (1979), The Multinational Operations of Swedish Firms, an Analysis of the Determinants and Effects of Stockholm Industries Utrednings-Instituut, Sweden.

Thompsen Stephen (1993), "Japanese Direct Investment in the European Community: the Product Cycle", *The World Economy*, vol 16 No 3, UK.

Thomsen S. & D. Nicholaides (1991), The Evolution of Japanese Direct Investment in Europe, Death of transistor salesman, London, Harvester Wheatsheaf.

UNCTAD (1995) Foreign Direct Investment in Africa, series number 28, UNECA, New York, Geneva.

UNCTAD, Commodity Yearbook, various publications, New York.

Seshamani V (1995) "Promotion of Direct Investment in Zambia, UNECA, Addis Ababa, Ethiopia, MIMIEO.

Shaw E (1973) *Financial Repression in Economic Development*, New York, Oxford University Press.

Soderstein BO (1992) International Economics, Macmillan publishing ltd, USA.

Swedenborg Birgitta (1979), The Multinational Operations of Swedish Firms, an Analysis of the Determinants and Effects of Stockholm Industries Utrednings-Instituut, Sweden.

Thompsen Stephen (1993), "Japanese Direct Investment in the European Community: the Product Cycle", *The World Economy*, vol 16 No 3, UK.

Thomsen S. & D. Nicholaides (1991), The Evolution of Japanese Direct Investment in Europe, Death of transistor salesman, London, Harvester Wheatsheaf.

UNCTAD (1995) Foreign Direct Investment in Africa, series number 28, UNECA, New York, Geneva.

UNCTAD, Commodity Yearbook, various publications, New York.

UNECA (1995) Transnational Focus, Addis Ababa.

Vernon R. (1966), "International investment and International trade in the product cycle",
Quarterly Journal of Economics, vol 80, pp, 190-207.

Wang Z Q (1995) Foreign Investment and Economic Development in Hungary and
China, UK

Wang Z Q and Swain N (1995) "The Determinants of FDI in Transforming Economies",
Empirical results from Hungary and China, Review of World Economics. UK

Woodward D. & Rolfe R.J (1993), "The Location of Export Oriented FDI in the
Caribbean Basin", Journal of International Business Studies, Vol 24 number 1.

Woodward D.(1992), "Locational determinants of Japanese Manufacturing
start-ups in the United States", Southern Economic Journal.

World Bank (1993) World Tables, Washington DC.

Zang Z & Ow Chin Hock (1996), "Trade interdependence and direct foreign investment
between ASEAN and China", World Development, vol 24, No 1.



Zambia Investment Centre (1997), Data processing Unit, Lusaka, Zambia.

Zambia Investment Centre (1996), "Trends in Foreign Investor Interest", The Zambia Investor Magazine, Vol 1, Number 1, March, Lusaka, Zambia.

DECLARATION

I the undersigned, declare that this thesis is my original work and has not been presented in any University. All sources of materials for this thesis have fully been acknowledged.

NAME: SAMUEL B. MULENGA

SIGNATURE: 

DATE: 19TH JUNE 1997

PLACE: ADDIS ABA BA.