ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

THE IMPACT OF FOREIGN AID ON DOMESTIC SAVING, INVESTMENT AND ECONOMIC GROWTH: THE CASE OF ETHIOPIA

BY

TOLESSA ABOMA

A THESIS SUBMITTED TO
THE SCHOOL OF GRADUATE STUDIES OF
THE ADDIS ABABA UNIVERSITY

IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS OF THE DEGREE OF
MASTER OF SCIENCE IN ECONOMIC POLICY ANALYSIS

JUNE 2001
ADDIS ABABA

Addis Ababa University
School of Graduate Studies

THE IMPACT OF FOREIGN AID ON DOMESTIC SAVING, INVESTMENT AND ECONOMIC GROWTH: THE CASE OF ETHIOPIA

BY
Tolessa Aboma

Approved by the Board of Examiners:

Haile Kebret
Advisor — Signature

Oliver Paddison
Examiner — Signature

Girma Estiphanos
Examiner — Signature

Table of Contents

ACKNOWLEDGMENT

My gratitude and appreciation goes to my advisor, Dr. Haile Kiberet for his unfailing guidance, invaluable suggestions and unreserved intellectual, material and Moral assistance. I am deeply indebted to his invaluable idea and advice, which enabled me a great deal in the realization of this study.

It is also my pleasure to thank the African Economic Research consortium (AERC) for it's sponsoring my stay in Nairobi at the joint Facility for Electives (JFE)

Lastly, but not least, I am grateful to my friends and individuals in different ministries who have helped my while I was writing this thesis.

Tolesa Aboma

June 2001

ABBREVIATIONS

EEC	European Economic Community
EPRDF	Ethiopian peoples Revolutionary Democratic Front
GDP	Gross Domestic product
GDS	Gross Domestic saving
GNP	Gross national product
LDCs	Least developed countries
MEDaC	Ministry of Economic Development and Co-operation
OCED	Organization for Economic cooperation and Development Assistance
OLS	Ordinary Least squares
SSA	Sub-Saharan African counties
UNDP	United Nations Development program

ABSTRACT

The objective of the study is to examine the relationship between foreign aid and domestic saving investment and economic growth in Ethiopia for the period 1964/65 to 1998/99. The analysis makes use of the Johansen maximum likelihood estimation procedure.

The main findings are: foreign grant has a negative and significant impact on saving, investment and growth, while foreign loan has a positive and significant impact on above mentioned economic performance indicator. Applying the Error Correction MODEL (ECM), foreign grant and loan are insignificant through out the model in the short-run.

List of Tables

List of Figures

SECTION ONE

INTRODUCTION

1.1 Background

In general when one speaks of the problems of economic development in least developed countries, one thinks of the factors that determine growth, namely: capital, labour supply and productivity, natural resources, entrepreneurship and the level of technology, among others. Capital is perhaps the major scarce factor in developing economies, and the serious shortage of capital is a fundamental problem, since it stands in the way of promoting economic development in those countries. Capital formation is crucial in increasing production and raising productivity. The rate of capital formation is determined by the saving rate, so that a sizeable portion of the national income has to be saved in order to attain sustained economic growth. However, the income in these countries is at a level, which does not permit a margin over subsistence needs, and hence, difficult to raise the saving rate. Consequently this low level of saving and the required rise in the investment rate create a widening resource gap.

To fill this resource gap least developing countries look for foreign resource inflow or foreign aid. Foreign aid, also called official development assistance (ODA), has been an important structural feature in the international economy. Originally, it began in the late 1940's under the Marshall plan with the purpose of reconstructing the war-torn economies of Western Europe. It has also served as a means to control

the international spread of communism (Todaro, 1989). Through time, the direction of the flow of foreign aid changed from developed countries, mainly from the United States of America to other developing countries. Consequently, developing countries have been receiving development aid since the 1950s (Krugman and Obstfeld, 1991). In particular, most countries in Sub-Saharan Africa have been receiving increasing amounts of foreign aid from various bilateral and multilateral sources.

In Africa, the share of Official Development Assistance (ODA) to GDP has significantly increased over the years. From a low of 1.9 percent of GDP in 1960-61, to 2.9 percent in 1970-71, 5 percent in 1983-84, it reached to 9.6 percent in 1995 (Krueger et al, 1989: World Bank, 1998). In Sub-Saharan, the average resource transfer amounted to $34 per capita in 1990 compared to $12 per capita for all LDCs, (Hanisch 1993). This average masks many important differences, as the amount has been even higher in some of the countries. According to World Resource Institute (1992), ODA is extremely important to the economies of many countries. It is indicated that aid accounts for over 20 percent of the Gross National Product (GNP) in 15 countries, out of which 12 are in Africa. Other sources also indicate that foreign aid flows represented more than 20 percent of GNP in the vast majority of the countries of Sub-Sahara Africa in 1990 (Gabas, 1993).

Despite the significant increases in foreign aid, the economic progress achieved by many Sub-Saharan African countries has not been satisfactory. Most of these countries have been suffering from low overall economic growth. Thus, the actual role of foreign aid in this context has been an area of wide controversy.

As Gabas (1993, p.89) noted, "despite the amount of external development aid inflows the African development has been characterized by crises." It is also noted that several countries in Africa have been experiencing deterioration in growth performances in spite of high and rapidly rising aid flows since the second half of the 1970s (White 1992). Similarly, Courier (1993, p.3) states, "the record of development aid in Sub-Saharan Africa is disappointing". This situation has raised serious doubts and a growing international concern about the role of development aid to Africa.

In contrast to the above, there are positive views about aid in Africa. It is considered to have beneficial effects. They argued that foreign aid has been doing well in Africa (Levy, 1988). In advancing this view Norton et al (1992) stated that foreign aid has significantly enhanced agricultural productivity in Asia, Africa and Latin America. It is probably due to this fact that LDCs, particularly those in Sub-Saharan Africa, have been demanding, among other things, more foreign aid (Dale: 1984, Salvatore 1990).

But current debate on aid goes beyond this reasoning and argues that effectiveness of aid is dependent upon the policy environment and policies such as the fiscal stance, inflation and trade openness which are considered to have significant effect on growth. Recent work by Burnside and Dollar (1997) has established that aid has a positive impact on growth in developing countries with sound fiscal, monetary and trade policies. In the presence of poor policies, on the other hand, aid is argued to have no positive effect on growth.

In Ethiopia, an inflow of external loans and grants started around 1950, the year in which the relationship between United States and Ethiopia began. In the pre 1975 period about 25 percent of the required total investment during three five-year plan periods (1957-1973) was covered by external public capital. The magnitude of loans and grants, which Ethiopia received in the years preceding the revolution, was not small. However, it is often argued that the direction of foreign aid was characterized by negligible long run development objectives. Similarly, during the post revolution period too, " 37 percent of total investment expenditure of the annual campaigns of 1979-1983" was financed by foreign aid (Dejene Aredo, 1992;p13). Thus in the subsequent years the magnitude of loan and grants which Ethiopia received increased continuously. In real terms, over the period 1991/92-1998/99 it is increased by 14 percent (13.97), to reach nearly 2853 80 million Birr in 1998/99 (see figure 2.5).

The crucial question that should come into picture at this juncture is that how each aid recipient country has been using the foreign aid resources, that is, whether countries use aid for savings, investment or for satisfying mainly immediate consumption, for the importation of capital or consumer goods? What has been the behavior of the governments' of aid recipient countries with respect to the allocation of resources provided from abroad? Which resource flow leads more to investment or imports? What is the relative contribution of these resources of foreign exchange to growth?

In view of the above basic issues, a number of studies have already made an empirical assessment of the impact of foreign aid on LDC's economic performances. Nevertheless, these studies have been suffering from inconsistent empirical evidences. That is, the empirical evidences on the matter do not provide clear-cut conclusion on the issues. Different cross-country investigations have come -up with different results and different policy implications. In sum, the existing theoretical controversies and the currently available empirical evidence on the above issues call for the need for further research on the issue. In particular, it seems imperative to empirically measure the contributions of foreign aid in Sub-Sahara African countries where aid is said to be of important source of government revenue while at the same time the countries have been suffering from decline in economic performance.

In the process, it is deemed vital to incorporate important economic mechanisms through which aid induces its potential influences on key macro variables. The empirical literature on the subjects suggests that the macro economic impact of foreign aid vary considerably among countries. This underscores the need for time series analysis of individual countries, rather than cross-country analysis, to see how growth patterns evolved over time within the same country in relation to the flow of aid. On the basis of the above background, this investigation was initiated to quantitatively examine the impact of foreign aid at macro level in particular and on economic growth in general.

1.2 Objectives of the Study

The macro-level analysis concentrates on the effects of foreign aid on a number of intermediate policy variables, like saving and investment. To generalize the investigation, the macro level inquiry was supplemented with the analyses of the impact of foreign aid on overall economic growth in Ethiopia. Holding other factor constant, the aid growth relationship need to be established for it would be meaningless to encourage foreign aid if the impact is negative.

The above objectives could better be illustrated with the following basic questions for which the study attempted to find answers: I) what have been the effects of foreign aid inflows on saving, investment and economic growth? II) Within the category of foreign aid, what has been the influence of foreign grants in contrast to

foreign loans? These are among the relevant questions on the role of foreign aid that need answers in the formulation of economic policy and development strategy. The search for answers to these questions through addressing the above objectives makes it possible to drive useful policy implications.

The significance of the study is three folds. First, the results of the study could also help in formulating relevant policies for domestic saving, consumption, investment and imports through better and more effective use of domestic and foreign resources. Secondly, the study may induce further research in this area especially on the aspects not captured by this study. It will also serve as additional material to the little literature existing on this topic. Last, the major methodological contribution of this study, in the line with same of the recent studies, is refocusing the impact of foreign aid on saving, investment and economic growth. It also shifts the approach to such investigation from cross-country analysis to the examination of behavior over time in single country. Furthermore, this study has attempted to over come most of the shortcomings of previous studies in the subject area and thereby to resolve some of the controversies in the literature on the contribution of foreign aid to the development process of less developed countries. It has, therefore, also implication for development theory.

1.4 Organization of the Paper

The remaining part of this paper has four sections. Brief summary of overall performance of the Ethiopian economy is presented in section Two. A section in which theoretical follows this and empirical literatures are surveyed. Section Four is devoted to the econometric analysis. For the analysis, the johansen maximum likelihood estimation procedure is employed. Finally, conclusion and policy implications are presented in section Five.

SECTION TWO

2. MACRO ECONOMIC PERFORMANCE OF THE ETHIOPIAN ECONOMY

2.1. Real GDP and Sectoral Economy Condition

The performance of the Ethiopian economy during the military period has been unsatisfactory on account of civil strife, recurrent drought, and in appropriate economic policy and management. As a result, the average growth rate of real GDP was 2.6 percent over the last three decade. During the imperial era, the economy had been growing at a fairly sustainable rate of 4.1 per cent per annum. As the population was growing at about 2.3 per cent per annum, the per capita GDP had been growing at 1.8 percent. Within the same period, the value-added in the agricultural sector was growing by 2.1 percent; the other sectors were growing by more than 6.8 percent per annum (see Table 2.1 and figure 2.1).

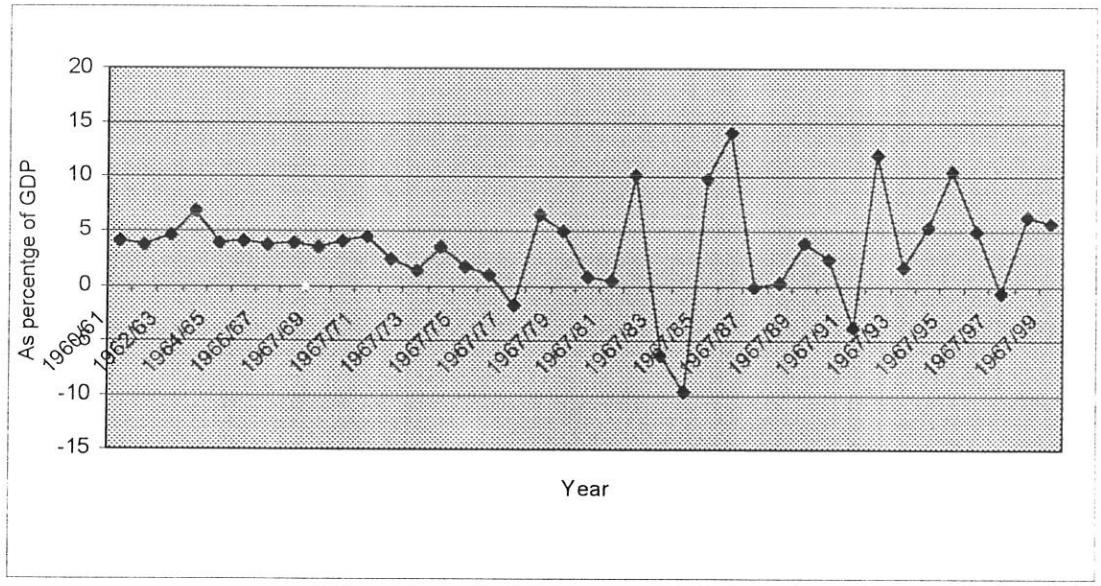
Table 2.1 Growth rates of Real GDP and its sectoral components.

Period	Growth rate of			Growth rates in valve-added in the various sectors			
	GDP	Population	PCG DP	Agriculture	Industry	Distributive service	Other service
1960/61-73/74	4.1	2.3	1.8	2.1	7.0	7.8	6.8
1974/75-90/91	2.1	2.8	-0.7	0.6	3.0	2.9	5.1
1991/92-98/99	5.4	2.8	2.60	2.6	8.1	7.8	8.5
1960/61-98/99	2.6	2.6	-0.006	1.2	3.0	3.7	5.7

Source: Computed from the information obtained from MEDaC (Various issues).

Since 1971/72 the growth rate of the economy started to decline but remained positive. Post 1973/74 it experienced tremendous fluctuations. The crusts were usually recoveries from recessions rather than actual booms. Hence the crests and deep droughts offset giving a resultant of a mere 2.1 percent average economic growth for the entire Derg period. This rate was not capable of catching up with the population growth rate. As the result, per capita GDP, declined to about 0.7 percent per annum for the period.

Figure 2.1 Gross rate of GDP



Source: MEDaC

During the Derg regime, the agricultural sector performed the least, where its value-added grew by less than 1 percent. The industrial and distributive service sectors grew by about 3 percent. The "other" service sector for which the administrative

and defense sub-sectors account the major share had the highest growth rate, at 5.1 percent.

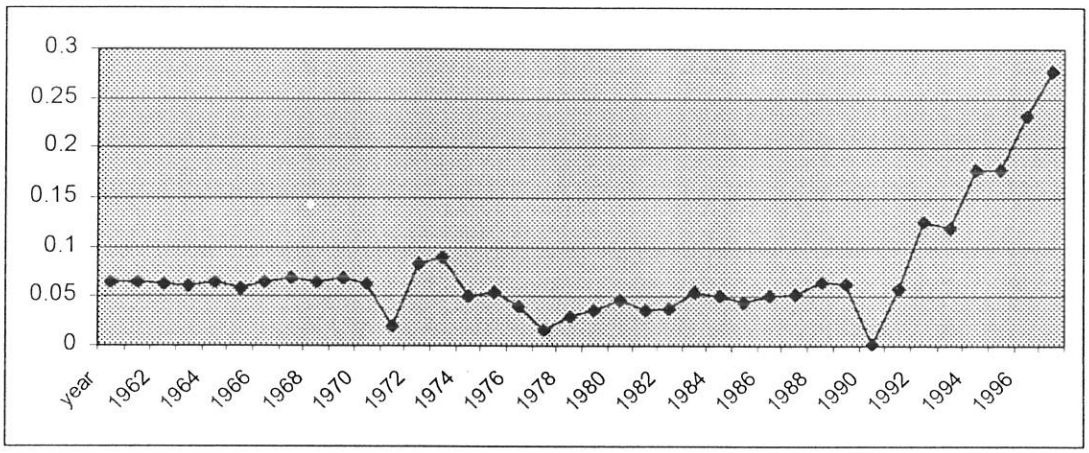
However during Ethiopian Peoples Revolutionary Democratic Front (EPRDF) the growth rate in GDP has been positive but it experienced fluctuations. On average the economy has been growing at about 5.4 percent for the period of 1991/92-1998/99. This is in fact one of the seven "fast" growing economies in African for the decade. If there had not been frequent drought, the growing rate of GDP would have been 5.7 percent. The value-added in agricultural sector has been growing by about 2.6 percent for the period 1991/92 – 1998/99. This rate would have risen to 3.1 percent if there had not been drought.

2.2. Saving and Investment

A country's economic development depends on its capacity to save and invest. Hence, for an economy to have appropriate level and rate of investment, there is a need to raise the level and rate of domestic saving as well. Like in many African, one of the major difficulties in Ethiopia has been the absence of adequate supply of local saving to finance domestic investment. The pattern of Ethiopian's gross domestic saving to GDP over the past four decades is shown in figure 2.2. The highest level of saving was achieved in the last two years of the imperial period. On average Gross Domestic Saving as percentage of GDP was 8.6 percent between 1967/68-73/74 with the highest record of 9.5 percent in 1974/75. Since 1975/76 saving to GDP showed a tremendous fluctuation but remained significantly lower

than this figure in the entire period under consideration and reached as low as 0.1 percent of GDP in 1991/92 respectively.

Figure2.2 Saving to GDP ratio



Source: MEDaC

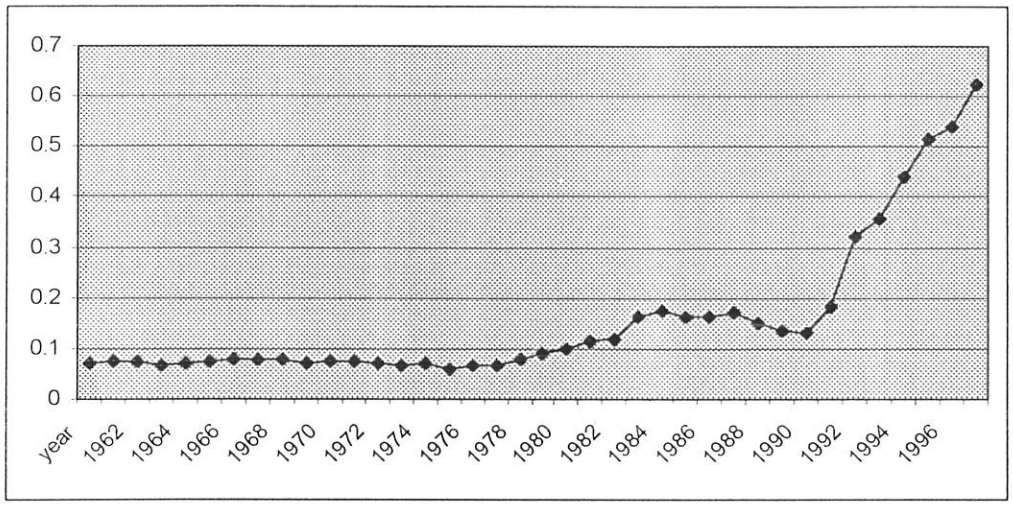
During the Derg period, the saving ratio fluctuated ranging from a high of 8.6 percent of GDP in 1988/89 and a low of 0.1 percent GDP 1991/92 respectively. On average GDS as percentage of GDP for the last 10 years of the Derg period was 7.1 percent per annum. Thus, the domestic saving was quite low not only in comparison with the pre-revolution period, but also in view of the country's investment need. The major cause for this dramatic decline in saving rate was not a result of the increased in public consumption, but what happened instead was a marked increased in government consumption.

The performance of gross domestic saving to GDP during EPRDF showed a sign of recovery. When we see the saving trend during post this period, the GDS to GDP in the first year was not different from the low level of saving registered during the

Derg period. But, this figure on average was 9.3 percent of GDP, which was higher than the average GDS to GDP registered during the last 10 years of the Derg period. Although the average was low, the trend of domestic saving showed a steady increase indicating that some of the measures taken by government encouraged saving.

Gross domestic investment fell from an annual average of 9.6 percent of real GDP in the late 1960's and it did not show significant improvement in the 1970s (see figure 2.3). In the 1980's, the level of real gross investment recorded a growth rate of 6.35 percent per annum to reach about 14.6 percent of GDP. It then declined by an annual average rate of 10 percent at current prices to 10.55 percent of GDP between 1991/92 and 1992/93. In the recent period investment to GDP ratio increased annually by 5 percent and reached 20 percent of GDP between 1992/93-1997/98. In fact, this is recorded as the fastest investment to GDP ratio in Africa in the recent period. Over the period of 1967/68-1998/99 gross fixed capital formation recorded an annual growth rate of only 0.40 percent in real terms.

Figure 2.3 Investments to GDP Ratio



In Ethiopia, though the investment rate is not that much high, it is not in divergence with the average for Sub-Saharan Africa, which is 18 percent. But saving does not go in Parallels with the rise in gross domestic investment. This results in widening resource gap (Figure 2.4). Gross domestic saving made about 90.80 percent of gross investment in the last two years of 1960s which magnificently declined to 77.55 per annum in the 1970s and then to below 30 percent (29.95 percent) per year in 1980s. In first two years of the 1990s, the proportion of domestic saving to investment in the country was minus 2.65 percent per annum. As it can be seen from figure 2.4, the ınvestment ratio exceeded the domestic saving ratio for the whole period with the exceptions of three years. The gap between domestic saving and investment amounted to about 1.30 percent of GDP per annum in the late 1960s, which rose to 2.15 percent in the1970s, and then to 10.25 percent per annum in the 1980s. The gap between domestic investment and domestic saving magnified and reached about 12.65 percent of GDP between 1991/92 and 1998/99. Domestic saving and total investment amounted to 6.68 percent and 12.65 percent

of GDP per annum, respectively, during 1991/92-1997/98 respectively. The net transfers including all forms of financing required closing the gap between domestic saving and investment averaged to about 6 percent of GDP during the same period. The above proportions suggest that the level of investment had been relatively high during the time under the study. It seems that this investment was not used productively or efficiently so that it contribute for better economic performance. The general patterns of change in gross domestic investment become clear from a relatively deeper analysis of change in the sources of its finance; total capital expenditure was used as a proxy for domestic investment. Accordingly, the evolution of Ethiopia n total expenditure by source of finance is given in figure 2.5. All sources of finance showed increasing trend since 1975/76.

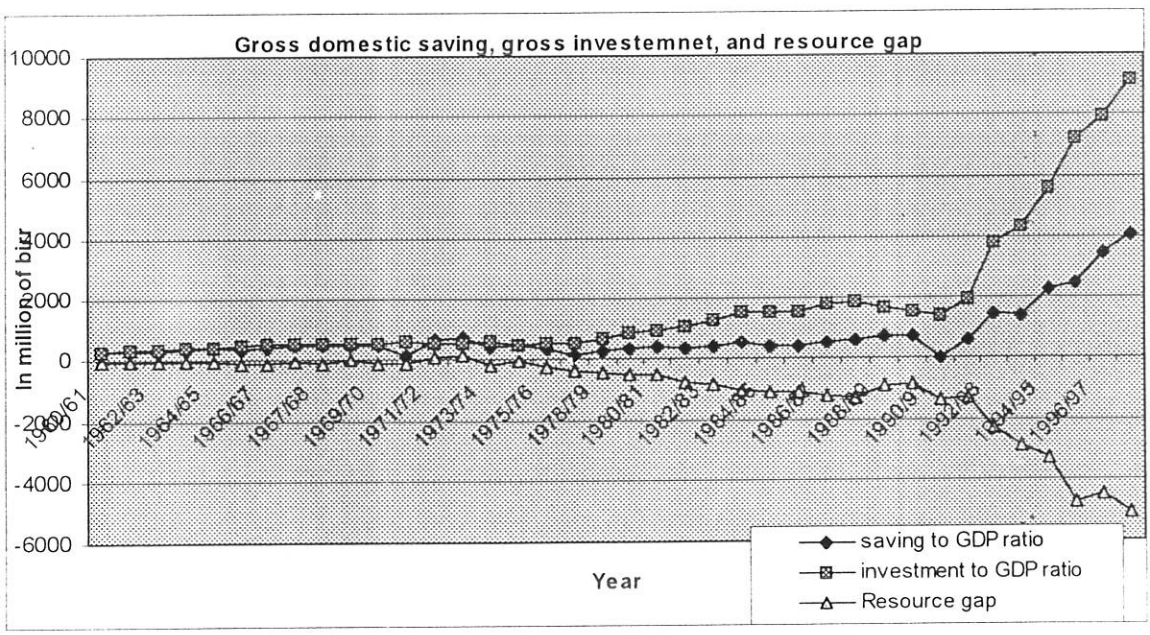
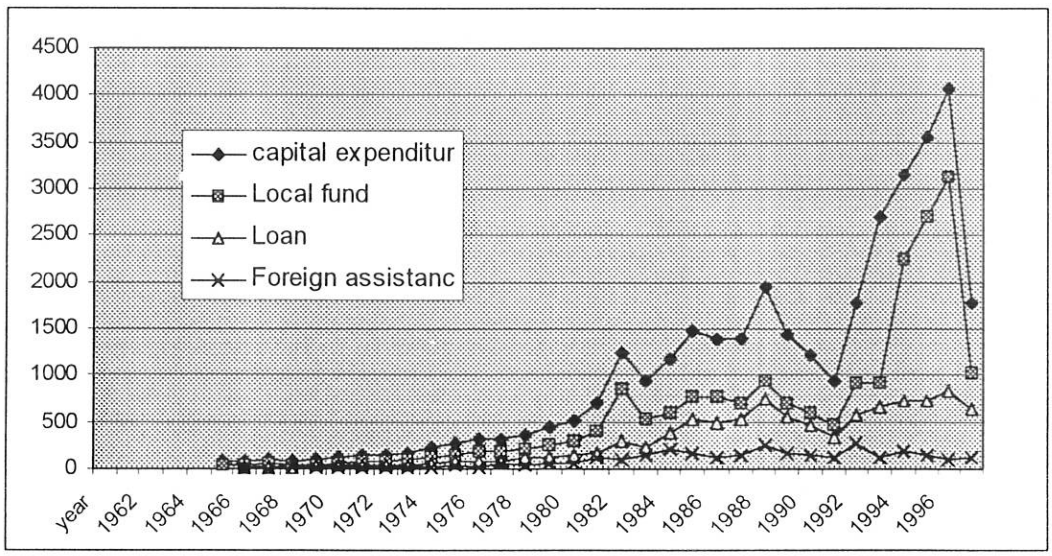


Figure2.*4 Gross domestic saving, gross domestic investment, and resource gap*

In the 1960s total capital expenditure was financed from local resources, foreign Grants, loans and technical assistance are contributing annually about 53.15 percent, 38.70 percent and 8.20 percent, respectively (see figure 2.5). These proportions remained the same in the 1970s with the exception of a decline in the share of foreign loans by 6 percent and rise in foreign grants by 5.5 Percent approximately and there were no much change in the proportions of all sources in 1980s. These figures show that foreign aid contributed annually about 46.85, 46.40 and 46.10 percent of the country's total expenditure in 1970s, 1980s, and 19980s respectively.

Figure 2.5 Capital Expenditure and source of finance



Source: Ministry of Finance

However, with the increase of consumption expenditure and the decline of domestic saving, the contribution of local funds to total capital expenditure consistently fell sharply to about 38.51 percent during 1989/90-1992/93, while the foreign loans and grants increased to 41.12 percent and 20.37 percent, respectively. These changes

have increased the share of foreign aid in the total capital expenditure to about 61.5 per cent per annum. This could be explained by the peak civil war, which adversely affected economic activities. The other factor is that led to low level of GDS were the weak development of financial institution in mobilizations domestic saving. Generally, they are obstacles to attract long-term depositors and making it available to investors. In time of lower saving, they simply fulfil the demand for investment found by higher inflow of foreign capitals. However, this is possible for very a short-run and whenever the fund is obtained. This implies that these countries are vulnerable to higher risk of economic crisis caused by debt service and fund indecencies resulting in balance of payment dis- equilibrium.

The large consumption expenditure of the country is also one reason for low level of domestic saving. The government expenditure of the country was 16.9 percent of GDP during the last ten years of the Derg period. However, this figure declined to an average of 10.8 percent of GDP during 1991/92-98/99. But the private consumption was higher during EPRDF than the Derg regime amounting to 82.8 percent of the average in 1991/92-1998/99. Thus, consumption expenditure of the country was the highest one. For instance, in 1997 the consumption expenditure of the country amounted to 92.2 percent while that of the low-income economies amounted to consistently 74.7 percent (see table 2.2).

Table 2.2 Consumption, Investment and saving

	Indicator	Ethiopia	Low-And-Middle Income Economies	Low Income Economies	Middle Income Economies	Sub-Saharan Africa
1983	Consumption	87.1	76.3	76.5	76.2	80.4
	Investment	9.8	23.4	23.3	23.4	18.6
	Saving	12.9	22.1	22.7	22.7	15.5
1990	Consumption	92.4	74.7	75.5	74.3	78.5
	Investment	13.6	26.8	25.2	27.6	20.8
	Saving	7.6	23.6	23.6	23.6	18.3
1995	Consumption	91.4	75.6	76.6	75.2	87.3
	Investment	16.4	24.1	26.9	22.7	12.4
	Saving	8.6	21.6	22.3	21.2	9.0
1997	Consumption	92.1	75.8	74.1	76.8	86.2
	Investment	12.5	24.3	27.7	23.1	16.7
	Saving	7.9	23.1	25.4	21.9	9.4

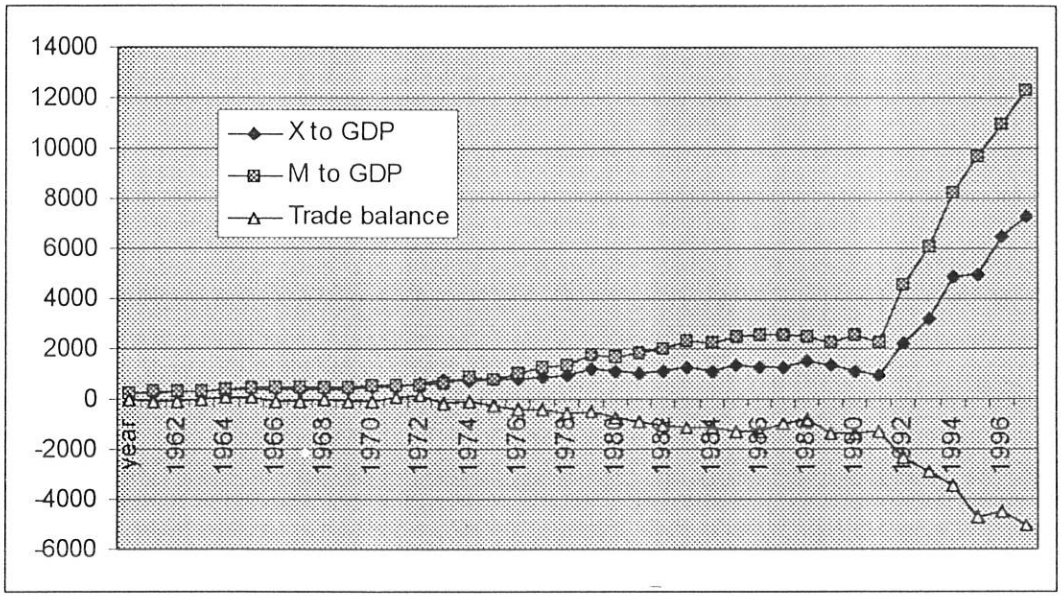
Source: **World Bank Development Report 1998.**

2.3. Balance of Payment

2.3.1. Balance of Trade

As it has already been explained, the value of the country's imports of goods and services (account for 17.55 percent of GDP) was higher than its exports, which made 12.40 percent of GDP. This suggests that the country's import cost has been steadily high compared to its export revenue (MEDaC, 1999). Consequently, the trade balances of Ethiopia, except the last two years of the imperial period, have been negative and increased between 1970 and 1998 (figure 2.6). In 1970, the trade balance recorded a deficit of 2.41 percent of GDP, which rose to about 13.15 percent of GDP in 1985. On average, the trade deficit was about 2.76 percent of GDP per annum in the 1970s from which it rose to about 11 percent of GDP in the 1980s. The deficit increased slightly to about 12 percent of GDP in the 1990s.

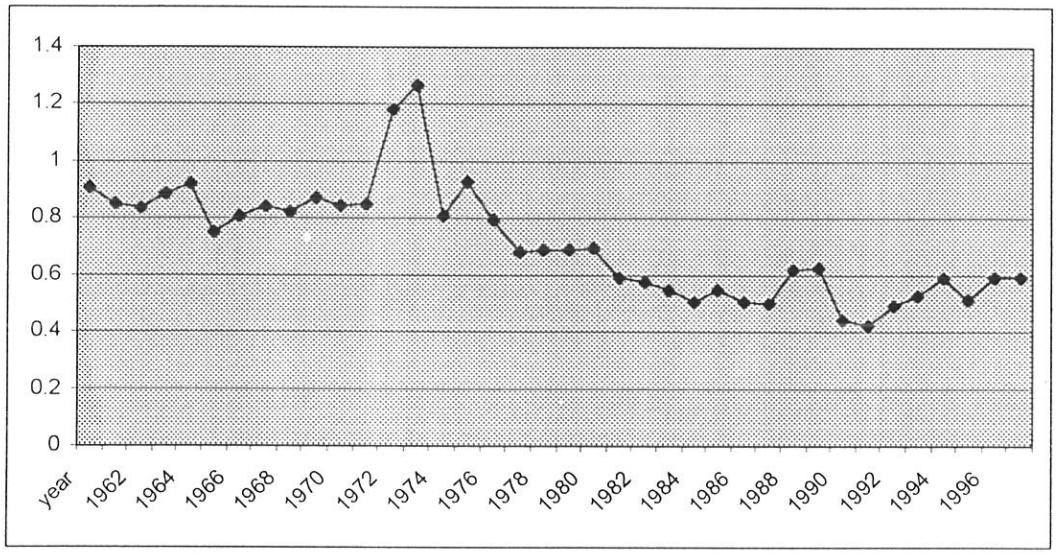
Figure 2.6 Trade Balance



Source: MEDaC

Accordingly, the ratio of total export to total import fell from 86 percent per annum in the 1970s to about 55.45 percent in the 1980s (Figure 2.7). This ratio further declined to 42 and 38 percent between 1991 and 1993 suggesting the huge trade deficits in the first three years of the 1990s. If it is assumed that export earning had exclusively been used to finance imports, exports could finance, on average, only about 60 percent of imports per annum over the whole period of 1970-1998. This was mainly because the stagnant export earning and raising merchandise imports.

Figure; 2.7 Exports to Import Ratio



3.2. Current Account Balance

With relatively buoyant imports and a sluggish export growth, the current account deficit before official transfer was 2.56 percent of GDP per annum in the 1960s and rose to about 7.45 percent of GDP in the 1980s from which it slightly declined to about 5.60 percent of GDP between 1992 and 1998 (MEDaC, 1999). The current account deficit before official transfer averaged 4.45 percent of GDP per annum during 1970-1992 and decreased to 2.40 percent of GDP per annum during EPRDF period (Tadess Getachew, 1994).

Net official transfer as a proportion of nominal GDP amounted to 0.34 percent of GDP in the 1970s and 2.73 percent in 1980s. It rose to 3.70 percent of GDP between 1991 and 1992. After official transfers, the current account turned into surplus of Birr 18.55 million in 1972, Birr 152.16 million in 1973 and Birr 82.80

million in 1974 making 0.42 percent, 3.30 percent and 1.61 percent of GDP respectively. On the average, the current account balance after official transfer registered a surplus of 0.12 percent of GDP per annum in the 1970s. However, it swung to a deficit of 3.90 percent of GDP per annum in the 1980s from which it turned to a surplus of 0.83 percent of GDP between 1991/92 -1997/98(MEDaC, 1999).

2.3.3. Capital Account

The capital account was in surplus between1970-1992 period with the exception of 1977, 1990 and 1992 when deficits were Birr 40.51 million, Birr 93.36 million and Birr 414.62 million accounting for 0.66, 0.80 and 3.22 percent of GDP, respectively (MEDaC, 1999). This account registered a surplus of 1.74 percent of GDP in 1970, which increased to 3.86 percent of GDP in 1980. The surplus in capital account reached its peak of 15.33 percent of GDP in 1982 from where it declined slowly until 1990 to record the deficit already noted. The capital account surplus was maintained over the years through increased borrowing from the public sector, but it was not always large enough to finance all the current account deficits during the period under consideration. The remaining parts of the deficit have been converted by changes in the country's international reserves.

2.3.4. Capital Expenditure

Capital expenditure is broadly defined as an outlay on development projects that result in the acquisition of fixed assets and there by enhance the capacity of the economy for the production of goods and the provision of economic and social services. Such outlays include spending on land development, construction of power plants, buildings, dams, roads and other construction, and purchase of machinery and equipment. It also includes payments for project study and design, management supervision, and direct labour costs.

In the last five years of imperial period on average about 40 percent of total capital expenditure was allocated to economic development. This figure rose on average to about 88.75 percent during Derge period excluding 1990/91 fiscal years. This share declined to 82.40 percent of total capital expenditure between 1990/91-1991/92. During the post reform period, this share decline to 70 percent by 1996/97 and to 57 percent by 1997/98 (MEDaC 1999, see Appendix 2.1). Allocation to the social sector on the other hand, grew from about 7 percent of the total in the pre reform period to 19.6 and 23.8 percent by 1996/97 and 1997/98, respectively. This development is consistent with government development priority, which among others focuses on enhancing social services.

A bit deeper examination of capital expenditure on economic development by sources of finance reveals that about 33 percent of total capital expenditure in the last two years of 1960s was coming from foreign aid. In 1980, the share of local

funds dramatically declined in financing capital, expenditure. For instance, in 1989/90 about 51.9 percent of total capital expenditure came from external (loan and assistance). This share declined in the post reform period it reached to 24.4 percent of total capital expenditure in 1995/96(See table 2.3,figure2.5). The above analysis implies that there was reliance on external loan and external assistance up to 50 percent or more of capital expenditure until the eve of the reform program has fallen below 30 percent in the post reform years. This is a solid confirmation to attaining fiscal soundness, which has proved to be a difficult task for many Sub-Saharan African countries. The increasing reliance on domestic sources of finance is also believed to have enhanced the implementation rate of development projects by reducing the inefficiencies of disbursement of external loan and assistance.

Table 2.3 Financing of capital expenditure (1985/86-1997/98)

In Million Birr

No	Source	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
1	Local funds	771	767	747.5	940.9	707.0	594.1	465.1	922.4	1919 3	2249.3	2693.0	3268.8	2733.6
	Share %	52.4	55.5	52.0	48.5	49.1		48.9	51.7	71.2	71.3	75	76.0	64.0
2	External Assist	163.4	121.9	154.7	249.9	180.4	153.3	135.9	277.3	117.8	185.1	142.8	150.0	495.0
	Share %	11.1	8.8	10.8	12.9	12.5	12.6	14.3	15.5	4.4	5.9	4.0	3.5	11.6
3	External loans	536.8	493.7	536.5	748.8	552.7	466.6	350.8	585.2	657.2	722.1	726.8	881.1	1036.5
	Share %	36.5	35.7	37.3	38.6	38.4	38.4	36.9	32.8	24.4	22.9	20.4	20.5	24.3
	Total % change	1471.8	1383.1	1438.7	1939.6	1440.1	1214.0	951.8	1784.9	2694.3	3156.5	3562.6	4299.9	4265.1
			-6.0	40	34.8	-28.8	-15	-21.6	87	51.0	17	12	20	-0.8

Source: MOF

2.4. Volume, Source and Composition of Foreign Aid

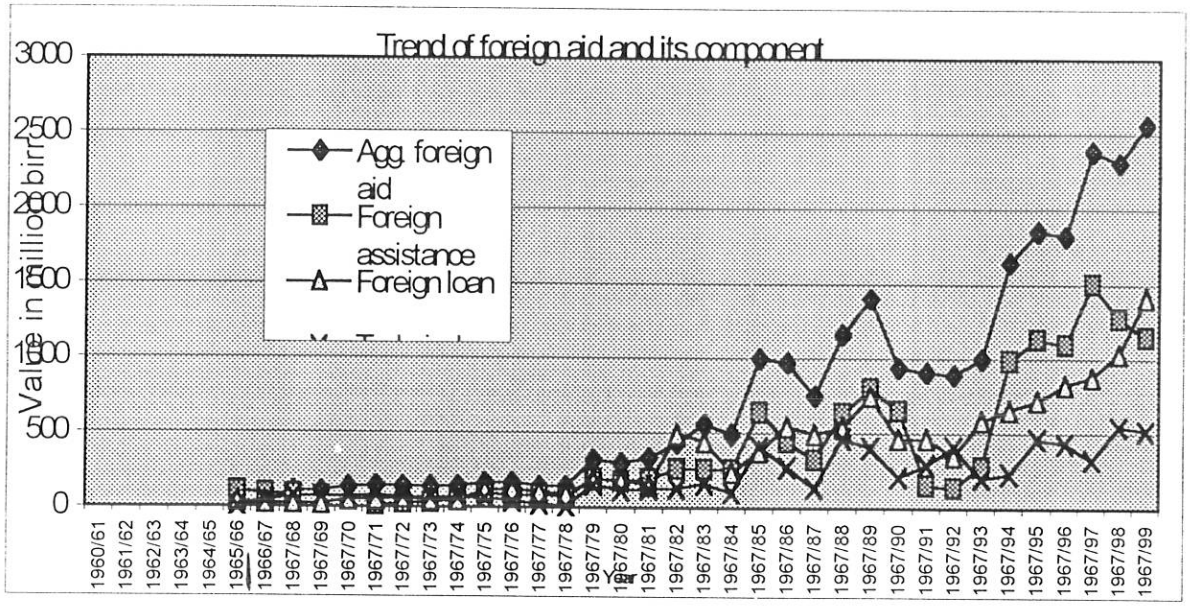
The structure and performance of the economy has made the country to be increasingly dependent on foreign aid during the last four decades. This poor performance of the economy adversely affected the mobilization in international financial resources and low capacity of foreign exchange earnings coupled with the growing resource requirements for the implementation of development project. Thus foreign aid has been a prominent and enduring feature of the Ethiopian economic and social land scope. Ethiopia was the country to have applied for a loan from the international monetary fund in 1974. Ever since the country has grown more has reached a stage where it cannot function with out it (Alemayehu Geda and Befekadu, 1999).

The foreign aids flow to Ethiopia is primarily in the form of official development assistance (ODA). The trends of these aid flows increasing over time. The country's real foreign aid receipts rose from US$ 197.97 million (3.15 percent of GDP) in 1967/68 to US$ 240.07 million (3.27 percent of GDP) in 1969/70 (figure 2.7). The inflows of foreign aid grew very slowly until 1977/78 and then increased steadily to reach US$ 195.20 million (5.44 percent of GDP) in 1979/80. It then rose to US$ 858.80 million in 1989/90 accounting for 16.60 percent of GDP. After a slight decline in 1990/91, foreign receipts again rose to US$ 1180.87 million (18.20 percent of GDP) in 1994/95. Over the last twenty-five years, real foreign aid to the country increased over eighteen and half folds. One of the explanations for this increase of capital flows is the improvement of Ethiopian policy on this regard.

In short, the above figures suggest that foreign aid has made considerable part of the country's GDP, which averaged 3.12 percent per annum between 1967/68 and 1969/70 (Figure 3.11). This ratio rose to 4.02 percent per annum in the 1970s and 9.21 percent of GDP in the 1980s and further rose to 18.33 percent per annum between 1994/95-over the 1967/68-1998/99 period. Foreign aid averaged to 6.50 percent of GDP per annum during the period under consideration.

In terms of composition, foreign aid inflows to Ethiopia have two components, namely foreign grant and loans. Out of the total 978 million Birr received during the last seven years of the imperial period, grants constituted 646.3 million Birr (65.1 percent) and loans amounted to 341.7 million Birr (34.9 percent). Foreign aid flows to the country were further increased in the subsequent years. During the Derg regime, the volume of aid was 11,185 million Birr, from which grants constituted 5, 526.6 million Birr (49.4 percent) and loans amounted to 5842.3 million Birr (50.6 percent (see figure 2.7). Hence, grants and loans had almost equal share during the military period, but for the last seven years of the imperial period aid was mainly in the form of grant. The flow of foreign aid picked up as soon as the transitional government took over especially when we compare it to the last two years of the Derg period. Out of the total 18,067.5 million Birr received during 1994/1995, 5842.3 million Birr (58 percent) was in the form of loans and the rest was in the form of grant. It was clear from the above discussion that Ethiopia received large amount of foreign development aid. But the amount foreign aid flow to the country is low when we compare to other aid recipient countries (Taddesse Getachew 1994).

Figure 2.8 Trend of foreign aid and its component



Source: Minister of Finance.

Foreign aid flows to Ethiopia from both sources of bilateral and multilateral donor Agencies. The examination of the composition of ODA also reveals that about 71.6 percent of aggregate foreign aid flows were from bilateral sources during 1973/74 and the remaining 29.4 percent were from multilateral donor agencies. Since from multilateral source increases to 56.85 percent, while bilateral aid decreases to 43.15 percent of total foreign aid flows. But a remarkable shift in the source from bilateral sources to multilateral ones has occurred since 1992/93. The share of bilateral aid to Ethiopia dropped during 1992-1999. For instance, in 1995/96 from the total aid that comes to the country 99.8 percent was from multilateral agencies and only 0.2 percent comes from bilateral sources (table 2.4).

Table 2.4 Disbursement of loan by lender

Fiscal year	1973/74	1978/79	1980/81	1984/85	1988/89	1990/91	1991/92	1993/94	1995/96	1997/98
Multilateral	24.9	125.1	181.4	129.8	301.4	319.1	273.1	2362.6	1744.8	1048.0
Bilateral	57.5	38.6	115.3	199.3	322.5	668.8	280.4	29.9	3.1	19.9
OECD	1.7	6.8	70.6	165.1	215.9	73.6	48.1	-	-	-
Others	0.7	32.7	13.6	34.2	7.7	22.3	0.3	-	-	-
Total	84.6	203.2	380.9	528.4	847.5	1083.8	601.9	2392.5	1848.9	1965.9

Percentage share

Fiscal year	1973/74	1978/79	1980/81	1984/85	1988/89	1990/91	1991/92	1993/94	1995/96	1997/98
Multilateral	29.4	61.6	47.6	24.6	35.6	29.4	45.4	98.8	99.8	53.2
Bilateral	68.0	19	30.3	37.7	38.1	61.7	46.6	-	-	-
OECD	2.0	3.3	18.5	31.2	25.4	6.8	8.0			
Others	0.6	16.1	3.6	6.5	0.9	2.1	0.04			

Source: Ministry of Finance.

The magnitude of foreign aid (loans and grants), which Ethiopia received in the period under consideration, was not small. It is often argued that foreign aid channeled for infrastructure services rather than directly productive activities. Thus, this may hinder long run development (Taddesse Getachew, 1994). Thus, if aid could not contribute for long run development, then it might have adverse impact on the macro economic variables of the country.

SECTION THREE

3. THEORETICAL FRAMEWORK AND EMPIRICAL LITERATURE.

The question of how foreign aid affects the rate of economic growth of a least developed country has been of interest to economists. This interest originates from divergent theoretical and empirical positions on the impact of foreign aid on the economic performance of these countries. This section is a brief review of the existing theoretical and empirical literature[5] on the issue. At the end of the review, an attempt will be made to summarize the major drawbacks of the existing empirical studies and to identify the knowledge gap to be filled in by further investigations including the current one. The review also provides a theoretical framework for modeling and evaluating the impact of foreign aid in the subsequent chapters of this study.

There have been wide theoretical controversies concerning the impact of foreign development aid on the economy of a LDCs economy. Broadly, there have been two conflicting standpoints: one that views it as growth enhancing and another to the contrary; each is examined below.

3.1 Impact of foreign aid on economic growth.

3.1.1. Pro-foreign aid argument.

The theoretical pro-foreign aid arguments consider foreign aid as an important contributor to economic development. These arguments concentrate on the

contributions of foreign aid to the better economic performance of least developed countries by influencing the level of domestic saving, investment as well as many other variables. The major arguments are briefly presented below.

The main theoretical argument on the macroeconomic impact of foreign aid has been whether it has contributed to economic growth. Foreign capital could be introduced as a supplement to scarce domestic resources and thereby contributing to economic growth (Chenery and Stroout, 1966). Similarly Todaro argued that, these inflows are assumed to play a key simulative role in promoting structural transformation and self-sustaining economic growth in the LDCs. In line with this, it has been very often stressed from the donor's side that ODA is given to promote welfare (EEC, 1990; World Bank, 1994). In particular, Clark (1991,p. 82) states "foreign aid flows can be focused on the immediate relief of poverty, infrastructure, and institution building or on promoting agriculture and capital investment".

The macroeconomic role of foreign aid, or foreign resources in general, in the economic development of developing countries has been analyzed in terms of the Harrod-Domar growth model. The Harrod-Domar model states that the growth rate of output is equal to the savings rate divided by the incremental capital-out put ratio, i.e., g = s/v, where, "**g**" is the rate of growth of output "**s**" is

[5] See white (1992) for an extensively and critical review of literature.

savings rate and "v" is the incremental capital-out put ratio. In 1960 the dual gap analysis, which is based on the Harrod-Domar economic growth model become popular. The basic argument in the two-gap model is that most developing countries are faced either with a shortage of domestic saving to match investment opportunities and/or a shortage of foreign exchange to finance the required imports of capital and intermediate inputs[6]. These are very often referred to as saving and the foreign-exchange gap[7], respectively. Foreign aid is then said to play dual role in development process: One, by supplementing low domestic saving and/or; second, by augmenting the capacity to finance imports of development goods. That is to say, foreign aid can fill the foreign exchange gap as well as the saving gap (Todaro 1989; P. 487). Concisely, the dual-gap analysis under some restrictive assumption synthesizes traditional and modern views concerning aid, trade and development (Thirlwall, 1987).

One of the first scholars who developed a theory of aid in support of the above argument based on Keynesian growth theory during the 1950s was Rostow. The major stage in Rostow's theory of "stage of Growth" is the process of the take-off into self-sustained growth. He raised the question how could the poor nations reach the "take-off" stage for self-sustaining growth. To answer this

[6] The usual restrictive assumption made here that the two are mutually independent and there is no substitutability between saving and foreign exchange, that is, between imports, and domestic resources, fixed factor proportion, an flexible composition of imports between consumption and investment goods, and rigid relationship between imports and investment and imports and output (Thirlwall, 1987, 297)

question, Rostow, based on the Harrod-Domar long term economic growth model, says that one of the necessary conditions for the take off to occur is an increase in the rate of net investment in the economies of the poor nations. According to him, domestic saving during the take off period could be supplemented by economic aid and raises the level of investment required. In this way, aid speeds up the process of reaching the stage of self-sustaining growth (Riddle, 1987).

Further role of foreign development aid can be shown with the help of a simple modification to the basic Harrod-Domar (H-D) aggregate production function. The H-D model has been criticized for its omission of substitution between labour and capital among sectors (white, 1992). Nevertheless, "the substitution of factors, that is, the change in the lobar-capital ratio, can only occur over a period of time, while both labor and capital are required in fixed proportions at any moment" (Chenery and Brumo, 1962; p. 34). Besides, given the physical, technological, skill, and institutional situations in most LDCs, the assumption of the dual-gap analysis are not so unrealistic. Accordingly, most economists continued to employ the model as it provides useful insights into the role of aid given in the rigid characteristics of the poorer LDCs short-run.

[7] A saving gap arises if the investment needed to a target growth in output exceeds domestic saving; while a foreign exchange gap arises if the value of imports needed to sustain the investment exceeds the foreign exchange available from exports.

The basic theory of economic growth explains that the determinants of a country's level of aggregate output are the country's resources and technical know-how. The national production function then relates total domestic output to the stock of national inputs, namely land, active lobar force, capital, and technological progress (Todaro, 1989).

Symbolically, this functional relationship can be written as:

$$Y_t = f(X_t, L_t, K_t, T_t) \qquad [3\text{-}1]$$

Where Y_t is output, X_t is land, L_t is labor force, K_t is capital and T_t is state of technology.

If land is included into capital, the production function can be rewritten as

$$Y_t = f(L_t, K_t, T_t) \qquad [3\text{-}2]$$

Given high growth of population and labor in many LDCs, it can be assumed that labor in its general form is not as such a limiting factor[8]. This gives a situation in which aggregate output is most likely limited, as it is believed in most development literature, by the capital and technology input. With this assumption, the relationship between output (y_t), capital (k_t) and state of technology (T_t) are given by a simpler H-D production function as:

[8] This is not, however, to disregard the importance and shortage of skilled manpower, due to lower percentage of educated people in the total population and also due to brain drain, in many developing countries and the role of technical assistance so far provided to these contries.

$$Y_t = f(k_t, T_t) \qquad [3\text{-}3]$$

Where Y_t is aggregate output, K_t is capital input, and T_t is state of technology.

With the assumption of an open poor economy, the capital input can be splited into domestic and imported capital. It is assumed that both are required in fixed proportions in the production process and they are non-substitutable. Under this situation, a simple Leontief fixed coefficient aggregate production function (Mekinnon, 1964: White, 1992) can be written as:

$$Y_t = Min\,[a K_{dt}\ ,\ b K_{mt}],\ a>0.\ b>0 \qquad [3\text{-}4]$$

Where Y_t is potential national output, K_{dt} is domestic capital input, K_{mt} is imported capital input, a and b are the output-capital ratios for domestic and imported capital inputs, respectively. The notation in **[3-4]** implies that the fixed potential output is produced by a factor, which yields the smallest cost. The model also assumes that units for d_{dt} and K_{mt} are chosen so that one unit of output can be used to construct one unit of K_{dt} or buy at the current terms of trade one unit of K_{mt}, and the terms of trade is assumed to be constant.

To increase domestic output the economy requires new investment. This investment is allocated between domestic and imported capital goods[9]. The extra output obtained from a unit of investment in **[3.4]** and therefore the growth rate made possible by a given saving rate, depends on whether there are constraints,

other than that set by the availability of saving, on the availability of domestic and foreign capital goods.

On the basis of what has been developed above, it is possible to illustrate the potential impact of foreign aid on the recipient country's economic growth. Suppose F_t is the amount of foreign aid inflow, grant and/or loan, that occurs during a given year and F is invariably to enhance investment. Let $f = F_t / Y_t$ is the rate of foreign aid inflow. The growth impact of this foreign resource inflow is examined under foreign exchange limited growth model.

Foreign exchange limited growth model state that, if a foreign-exchange gap exists, that is, an export-import constraint is dominant, f has the effect of supplementing x, the capacity to import capital goods. The maximum amount of foreign capital that the country acquires in a year in terms of GDP ratio, amounts to $(x+ f)Y_t$. The maximum value of investment to GDP ratio possible is given as:

$$I = (b / d)(x + f)Y \qquad \textbf{[3-5]}$$

The growth rate with foreign aid would then be

$$g = b(x + f) \qquad \textbf{[3-6]}$$

b must be greater than d if production requires input of both domestic and imported capital goods.

---

[9] This originates from the assumption of no substitution possibilities between the two types of capital goods and they are required infixed proportions.

Alternatively, the growth impact of foreign resource inflow can be analyzed using saving limited growth model which argued that, if a saving constraint prevails, that is if economic growth is limited by the level of domestic saving foreign aid inflow (f) has the effect of supplementing saving (s) or increasing the level of investment in both domestic and imported capital goods. Hence, the total investment equals sy_t plus the amount that can be purchased with the foreign exchange obtained through aid, fy_t. Investment would be equal to $(sf)y_t$. The growth rate would then be:

$$\mathbf{g} = \alpha\,(s+f) \qquad \textbf{[3-7]}$$

From the above expression, it is evident that the principal economic argument in support of foreign aid flow into LDCs is its contributions to the scarce domestic resources and/or assurance of the imports of essential goods from abroad. In other words, the original purpose of foreign aid is to simultaneously allow recipients to ease their foreign exchange constraints and to add to their rate of capital accumulation. Foreign aid accomplishes this by providing resources directly and indirectly by saving the excess cost of import substitution (Weisskopt, 1972).. In brief, based on the dual-gap analysis, foreign aid is theoretically explained to contribute to a poor country's economic growth by supplementing domestically available saving and by enabling the importation of more development goods in addition to what would be possible with export earnings alone.

3.1.2. Impact of Foreign Aid on Saving

Conventional aid theories state that, the main role of foreign aid was to supplement domestic saving or increase the rate of domestic capital formation (Rosentein-Rodan, 1961; Chenery and Strout, 1966). This is the presumption of the poverty trap models, like the dual-gap analysis, which predict that all or a great fraction of aid is saved and leads to growth through investment (Boone, 1994). Reduced to its essentials, "the purpose of foreign aid is to augment the volume of resources available to a developing country or in the language of microeconomics to push its production and consumption frontiers outwards" (Mosley et al.,1991; p.30).

Accordingly, one of the principal questions about the effectiveness of foreign aid is how the recipient government allocates it: for saving (future consumption) or for current consumption. This aid-saving debate has been described using the budget constraint. Let us try to illustrate the case using the most frequently used geometric figure (white, 1992). Assuming that the aid recipient government does not wish to reduce either current or future consumption, the "menu" for country that receives foreign aid is defined in figure **[3-1]** by points F and G on the post-aid consumption possibility curve.

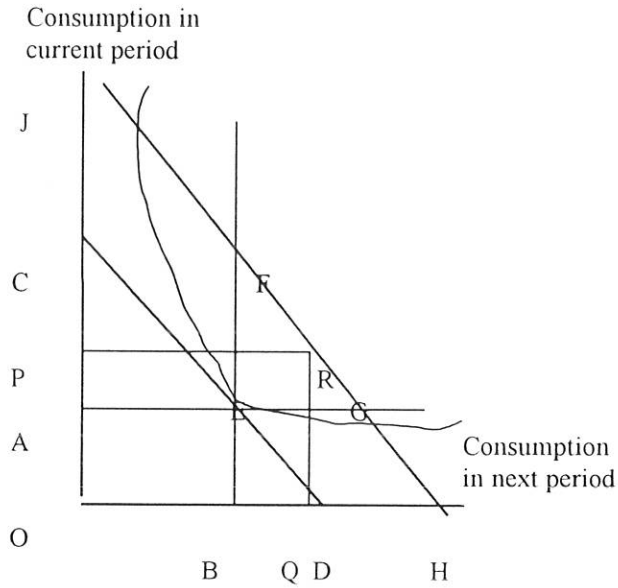


Figure 3.1. Present versus future consumption (saving) foreign aid allocation choices facing a recipient governmen‘
Source: Adopted from white (1992)

Without aid, budget constraint CD and current consumption out of total income OC is OA and saving is AC, which yields BO [equal to (1+r) OC], where r is the rate of return on investment) of future consumption. An aid inflow of CJ shifts the budget constraint out of JH. There is one of the two effects of this relaxation of budget constraint. On one hand if the full amount of the aid inflow is allocated for future consumption, MPC is equal to zero meaning that aid inflow is strictly intangible, the new equilibrium would be at G. The current consumption then remains unchanged and saving (future consumption) increase to AG. This is in line with the argument of the "aid optimists" that the recipient country's government allocates the aid inflow in the vicinity of point G. Such that the aid inflows provide a significant increment to investment.

In contrast as it would be explained further, there is a possibility that aid inflow might be diverted into current consumption, that is, if the MPC is between 0 and 1, and the new equilibrium lies between G and F, such as at point R. The "aid pessimists" considered a typical aid recipient country's government as likely to allocate incremental resources mostly to consumption (ending up at or near point F). If MPC equals to one, the new equilibrium would be at F, implying that aid inflow becomes perfectly fungible. Under this situation the effect of foreign aid is simply to increase the income of the recipient country, which might divert into current consumption.

If the aid recipient government chooses combination R, the current consumption increases by AP and future consumption by BQ equal to (1+r) EF. Total saving (domestic plus foreign) increase (from AC to PJ), but by less than the value of the aid inflow. Therefore, foreign saving (that is the aid inflow) has displaced domestic saving. It is now only PC, having fallen by AP, that is, and the extent to which the inflow is used to finance current consumption. The point emphasized here is that foreign aid inflow represents an increase in the recipient country's income which, unless the MPS is one, is allocated between both consumption and saving depending on the MPC. The range of potential government behaviors between these extremes is clearly infinite (Mosley et al, 1991). The actual situation can only be determined from empirical analysis of individual aid recipient country's aid allocation behavior.

3.1.3. Impact of Aid on Consumption and Investment

It is true that even in the absence of foreign aid every economy faces a trade off between consumption now and consumption in the future that is investment. The more investment an economy undertakes now, the less it consumes now to release resources, the more it will be able to produce and consume in the future. Foreign aid resources, just like domestic resources could be allocated for investment and/or for consumption. As it has already been explained, LDCs can effectively transform foreign aid into purely income-augmenting funds and thus purely fundable resources (Pack and Pack 1993; Weissenkopt, 1972). This directly influences how these countries governments allocate foreign aid for the expansion of productive expenditures, expansion of consumption expenditures, tax reduction or other objective of government policy. Grasping the concept of the interplay between capital formation and consumption spending requires an understanding of a country's response to price and income movements and some grasp of the effective mechanism of foreign aid and the responsiveness of aid donors to a recipient country's needs (white, 1992;Mosley et al, 1987).

In sum, foreign aid is argued to make a large proportion of most LDCs national income, supplement domestic saving, and encourage domestic investment. Through one of these mechanisms, foreign aid is believed to accelerate their economic growth and development far beyond what would otherwise be possible.

3.2 Contra-foreign Aid Arguments

There is considerable literature with equally impressive theoretical arguments against foreign aid inflows. A number of writers have been expressing skepticism over the role of foreign aid in enhancing economic development. An even extreme view considers foreign aid as harmful. As most of the contra-foreign aid arguments are just opposite to the pro-foreign aid arguments, it suffices to only make a very brief review of them.

The first theoretical argument against foreign aid is that aid does not promote development, and in some cases it can even retard the rate of growth in LDCs. The crux of this argument has been that foreign aid, rather than being a supplement to domestic saving, reduces the rate of domestic saving (Griffen, 1970: Bowles, 1987). This adverse effect of foreign aid is said to work through its impact on the mobilization of domestic resources. Faced with higher inflows of foreign aid, LDCs governments may lower their tax collection efforts, which it turn, is believed to reduce domestic saving (Griffin and Enos, 1970, Papank 1972).

Secondly, in line with this theoretical argument, many authors acknowledge the high frangibility of foreign aid. With the increase in foreign aid, these governments may change the composition of their public expenditure- the recurrent and capital expenditures or reduce their local borrowings. More realistically, a large fraction of foreign aid is said to be used to increase consumption rather that investment (Mosely, 1972: Weisskopf, 1950: Boone, 1994). This implies that there is a

considerable diversion of aid, and/or domestic resources from developmental purposes to current expenditures. It is on this account that a wide class of balanced growth models predicts that all aid is consumed with no impact on growth (Boone, 1994).

Thirdly, external debt is another main adverse economic effect associated with foreign aid. Inflows of aid, particularly in the form of loans, result in massive debts and debt servicing burden and thereby exacerbate LDCs balance of payments deficits. In turn, debt servicing and deficits in balance of payments are said to be crucial impediments to the country's development. As krueger (1997: P.48) puts it "increasing public resources to service debt will be likely to reduce incentives and resources available to private sector sufficiently to preclude the necessary investment response." The higher the debt- service payments, which has been very costly to some developing countries, the less would be the resources available for development as it restricts imports of capital and intermediate goods. This in turn, reduces the rate of growth and further lessens domestic saving available for investment and debt-servicing purposes (Bacha, 1992). In general terms, the increase in saving and investment process for devoted country is partly constrained by debt-servicing burden. Consequently, as Fischer (1987: P. 124) notes "The growth rates of the heavily indebted countries have been very low".

Foreign aid inflows are also believed to influence the fiscal behavior of LDC governments, mainly taxes collections and borrowings as already pointed out.

More recurrent academic work has concluded that aid recipient governments respond to higher foreign aid by reducing taxes and reducing borrowing from non-concessional sources as well as from local source. In support of the view, Griffin and Enos (1970:326) and who were among the first critics of foreign aid, remark:

> *Foreign aids tend to retard development by leading to a lower domestic saving by distorting the composition of investment and thereby raising the capital output ratio, by frustrating the emergence of indigenous entrepreneurial class, and by inhabiting institutionalized reforms.*

To sum up, all the above arguments cast doubts on the effectiveness of foreign aid flows to enhance development. In line with the above, some sources (the Courirer, 1993) indicate that foreign aid resources have disappointing records particularly in Sub-Saharan Africa countries. The crucial question here, that it is possible to explain generally poor records of development aid in Sub-Saharan Africa countries with one or more of the above theoretical arguments?

3.4 Some problems with Aid

Despite its contribution to development, aid also has a number of problems associated with it. In the first place, the motives for giving aid by donors are not purely developmental[11]. A naive logic, of course, would lead one to believe that aid is directed either where there is greatest poverty or, alternatively, where it can be

best employed to put an end to an intolerable situation. Even a cursory examination of available data, however, shows that this is not the case.

Although it seems that aid is synonymous with charity given to alleviate poverty, the main motive for the rich countries to give aid to poorer ones is to promote their own interest. Self-interests such as "winning useful friends," "supporting strategic aims," or promoting donors exports, it is argued, are the main motives to give aid (Todaro, 1995 p. 14). For example, almost half of America's aid budget over the past two decades has been earmarked for Egypt and Israel. Peace in the Middle East may be worth a lot to America, and to the world, but neither Israel nor even Egypt is among the world's neediest countries (The Economist, 1993).

One motive present in nearly all aid policies, the one by which their effectiveness is probably judged by the providers of aid, is the end eave to establish or, where it already exists, to maintain and possibly expand the donor country's international influence. The objectives of aid giving, more over, are both political and economic. Economic insubordination is perhaps more severally judged than political misbehavior. For instance, unfriendliness to the donor country's investors, nationalization or expropriation may provoke temporary or definite sanctions according to the severity of the case (Jibor, 1973; p. 70).

---

[11] Providing some insight as to why aid is not promoting growth. Fundability of aid means tat aid is not channeled into intended project with low rate of return or no return at all.

Among some problem related with foreign aid, aid tying and the debt problem are the common. Capital inflow, which is for development, is mostly foreign aid, and there is also the debt problem. Tying of aid, especially procurement tying, has a higher probability of reducing the quality of goods and services and increasing the cost so that the real value of aid to the recipient is reduced. The costs of tying to the

Recipient vary based on the factors such as:

> *The flexibility of substitution, in that the recipient country enjoys access to more than a single source of foreign aid: the extent to which such exploitation of substitution possibilities is permitted by the donor countries, the willingness and ability of the recipient country, via optimal procurement practices and related policies, to exploit such substitution possibilities by promoting competition among donors (Catrinus, 1991; p. 15).*

However, studies on the cost of aid tying suggest that tying reduces the value of aid by "an average of 15 to 30 percent, and in individual cases much higher. "Besides, there are also indirect costs of tying which result from "additional administrative over heads and delays and lack of donor co-ordination" (Ibid,).

Bilateral donors argue that there are two economic reasons for tying. First, they assist developing countries, and in return want to benefit by exporting their industrial products to the same countries. Donors also need to minimize the cost of aid on their balance of payments. But tied aid represents only a small percentage of the donor's countries total exports. Thus it is importable that aid tying provides

significant macro economic benefits to any donor's domestic employment or balance of payment aggregates (Harry, 1969; p.13).

The second reason for tying, which concerns the multilateral aid agencies, too, is the desire to influence the policies and resource allocation patterns of the recipient country. The other problem associated with aid is the debt problem that stems directly from loans. A loans bear's interest, and depending on the terms of the loan, the payment of interest and amortization of the loan is a burden to the recipient's economy. This financial burden, more over, is escalated by the economic dependency of the undeveloped countries as the suppliers of only food and raw materials to the developed countries. This because fluctuations in the demand for and hence the price of the primary countries create frequent deficits. Borrowing from the creditor countries finances the deficits. Servicing the debt- payment of interest and a moralization requires that a portion of future exports be devoted to this purpose instead of buying needed imports. Hence, further borrowing is induced to pay for their regular imports (George, 1974: p. 144).

The external debts of the developing countries are composed of different kinds of debts (public-concessional, public non-concessional and private commercial). Each of those different kinds of debts has their own terms and conditions of repayment, interest rates and maturity. The effect of each of these debts on the economy of the debtor country is also different. Therefore, "the composition and type of debts are more important than the actual level of in datedness" (Balassa, 1984; p. 104).

To evaluate the debt situation in an economy there are a number of indicators such as: the debt-GDP ratio (which relates external debt to the gross domestic product); the debt-export ratio (which is the ratio of debt to the export of goods and services); and the debt service ratio (debt service as a percentage of the export of goods and services (Balassa, 1984)

The debt problem should be analyzed in the context of both long-run growth and short-run management of debt. In the short-run the debt problem is specially related to the balance of payments of the borrower. In the long run, a country's debt servicing capacity is determined by the contribution of loans to the economic development of the country and the long run balance of payments equilibrium (Ibid). In other words, to have a good debt servicing capacity, the contribution of loans to the successful performance of the economy in capital formation, and expansion of exports should exceed the long run repayment of interest and a moralization of loans.

3.5. Empirical Evidences

The pro-aid studies tried to test some form of the hypothesis that aid stimulated growth through higher investment and by decreasing saving constraints. However, the aid critics tested that aid has a negative effect on domestic saving and investment, and hence hinder economic growth. Given these controversial issues, most professional economists tend to think that whether aid is effective

or not is an empirical question that can be addressed only with empirical evidence.

Thus, inter-country statistical analyses have been aimed at testing the relationship between Macro variables & foreign aid and at resolving the question of the contribution of aid in raising economic growth. The cross-country studies as well as time series analyses of the impact of foreign aid have provided an ambiguity results which raise series to resolve the theoretical debate. Some result show that aid leads to a significant increase in domestic saving levels and to higher rates of economic growth and others show the opposite effects at different time period for different groups of countries (Cassen, 1993). While others fail to provide a statistically significant relationship between aid inflows and economic growth.

In support of the conventional view, many studies concluded economic growth and foreign capital inflows, especially aid, have the most unequivocal impact on growth in LDCs. Levy (1988) examined, in a cross-country study, the relationship between saving, foreign aid, investment and economic growth in the low income countries of sub-Saharan Africa. He found a positive and significant correlation between aid and investment as well as economic growth. Balassa (1985) studied the determinants of economic growth over the period of 1973-79 covering the entire spectrum of development (disaggregated according to the source of saving as foreign saving and domestic saving) and exports,

besides other independent variables. He found that the impact of foreign aids to be statistically insignificant.

Victor's (1988) objective was to provide some quantitative evidence on the relatio ship between saving, foreign aid, investment and economic growth. Data on low-income African countries was used to measure the extent to which higher levels of concessionaire aid are associated with higher rates of domestic investment and economic growth. His empirical work took two forms: first, he estimated each equation with average values for the variables, and also examined annual observations in a pooled cross-sectional time series. He empirically tested for the correlation between aid as a share of recipients GDP and several other explanatory variables with recipient's investment and economic growth rates. The key major finding in this study was that aid positively and significantly correlated with investment and economic growth.

The major cross-country analyses which have shown the negative impacts of aid on recipient economies are those of Areskong (1969, Griffin (1970), Griffin and Enos (1972), weisskopt (1972 and 73) and Bowles (1987) all characteristics of the thrust of these studies is the claim made by Griffin and Enos that increased foreign aid actually lead to decline in domestic savings and hence that foreign aid has a negligible or even a detrimental effect on growth rate of the recipient country.

Griffin and Enos (1970) regressed the average growth rates of 12 Latin American countries on the ratio of aid to GNP for the period 1957-1964, and found that the coefficient of the regression was negative. The effect view is that foreign aid by the developed countries to less developed countries is nothing but "a sophisticated instrument of control" and it enables those power to evade and avoid fundamental reforms". Gulati (1976) found quite opposite results to the conclusions of this radical school about all foreign aid inflows using a sample of 38 LDCs from Africa, Asia and Latin America. Combining aid with other capital inflows and regressing the growth rates on saving and all capital imports, he found a strong and statistically significant correlation between the dependent variable (GDP growth) and independent variables (ratio of all capital imports to GDP and ratio of saving to GDP).

Weisskopf (1972) using pooled cross section, data and a two-stage list square estimation procedure studied the impact of foreign capital inflows. In the process, he distinguished between the types of aid (grants and loans) and the sources of aid (bilateral and multilateral). His results suggest that aid increases with varying magnitude investment and simultaneously facilitates a reduction in the level of domestic taxes and borrowing. He also found that the precise response of public consumption to aid varies according to the type of aid. While grants have stronger pro-consumption bias, loans are more pro-investment.

Bowles (1987) by applying Granger causality test, investigated whether a negative correlation between foreign aid and domestic saving holds for time series data. The author recognized that unlike earlier cross- country studies, there were considerable variations in his results. In ten of twenty countries, he found no casual-relationship in either direction between foreign aid and domestic saving. In the remaining ten countries of his sample, he found a mixed direction of causality. In some countries, domestic saving responded to aid inflows; in other countries falling a saving rates caused increase in foreign aid in flows, and still in two countries he found bi-directional causality between aid and saving. The author concluded that in those countries, which received the most aid from multilateral institutions, their inflows were more likely to be determined by their saving behavior than vice versa (Bowles 1987).

Islam (1992) focused on the supply side of the economy and developed an econometric model to quantity the effects off foreign aid and its various components on economic growth using cross-country data for least developing countries. The result showed that domestic savings to GDP ratio was significant at 10 percent level. In general, foreign aid had a marginally significant positive contribution to economic growth. Mbaku (1993) estimated function to test for the relationship between foreign aid and economic growth in the least developed countries with higher sample size and little decomposing aid than the above model. He found that domestic resources proxied by savings as proportion of GDP have positive, significant and stronger resources,

which revealed negative and insignificant impact on economic growth. Steven and Hendrick (1996) examined empirical evidence on the relationship between economic growth and the three principal sources of investment funds namely foreign aid, foreign direct investment and domestic saving using individual regressions for 11 sub-Saharan countries. They used time series approach rather than cross sectional approach. All the three sources of investment were expected to have a positive effect on growth. He notes that the mixed results for the effect of foreign aid reflect the complex relationship between foreign aid and economic performance.

✓ Burnside and Dollar (1997) addressed the following questions in revisit to the controversy regaining on the impact of foreign aid on growth. "Does aid have a positive effect on growth in the presence of good economic policies?" Have donors systematically allocated assistance in favor of good policies?" They used a panel data set of 56 countries and six-four year time periods from 1970-1973 until 1990-1993 to determine empirically the relationships among aid, policies and growth. They interacted aid and policies using a policy index comprised of budget surplus, inflation and trade openness. The result they obtain was on average aid as little impact on growth but a robust finding was that aid has a positive impact in a good policy environment. They also found that on the margin, good policies are rewarded by higher aid. The result also

shows that aid is positively correlated with government consumption[10]. They further considered an interesting counter-factual where more aid was allocated on the basis of policy rather than on the basis of donor interest while leaving the total quantity of aid and policies of the recipients unchanged. They found that this would raise the mean growth rate in their sample for poor countries from 1-1 percent to 1.4 percent.

Elbadawi and Mwega (1998) have estimated a saving function both for LDCs group and for SSA (Sub-Saharan Africa) using different specifications (a pooled estimation with regional dummies, fixed-effect based estimation and estimations based on GMM-IV). In the study for all LDCs income and its growth have positive and significant effects on saving rate when the pooled Model is used; with the fixed-effect model, however, they becomes statistically insignificant. When the model is estimated using the SSA data only, the effect of per capita income is found to be important (Elbadawi and Mwega, 1998, P.19). Cross-country evidence also suggests that per capita income has a positive effect on saving rate. According to Deaton's (1990) survey, the literature on household saving in LDCs as almost uniformly found that saving will increase with increase with 'permanent income (see Muellbauer 1982 for srilank; Berancours 1971 for Chile' and paxson 1989 for Thailand, all cited in Deaton 1990). This does not mean, however, that there is a strong link between saving and growth: similarly

[10] they estimated an equation for government consumption separately because it has no robust association with growth. They found a strong positive impact on government consumption confirming fangibility of aid thus

the evidence for good inter-temporal allocation by households is also weak (Deaton, 1990, P. 86-87).

Haile and Alemayehu (2000) examined empirical evidence on the relationships between savings, foreign aid and economic growth, and drew policy lessons that are relevant for African economies in general and Ethiopian in particular. The study uses both descriptive statistics and an error correction model to examine these relationships. The findings suggest that private saving has a significant positive association with economic growth and private investment. Similarly, consistent with the recent literature, economic aid is negatively associated with private saving. The most important determinants of private saving in Ethiopia are GDP per capital and financial deepening, while investments (both private and public) are the most important determinants of economic growth.

What one perceives from the above exposition is that the empirical impact of foreign aid has not been clear. The contributions of foreign aid inflows in development process are one of the issues that continue to exercise the minds of academic economists and policy makers (Nixson, 1989). There is a direct need for more precise information about the socio economic impact of foreign aid that makes further studies necessary, as it is an area of practical importance both to donors' policy as well as to the recipient countries. For policy analysis,

---

providing some insight as to why aid is not promoting growth. Fundability of aid means that aid is not

this impact should be evaluated from the point of view of a particular county (Mpsley et al, 1987, white, 1992). The sub-Saharan African countries where high and rising foreign aid inflows are accompanied by deteriorating economic performances (White 1992) make good case studies.

3.6 Limitation of Previous Studies

It has been noted that the currently available empirical studies suffer from a number of very serious limitations. In this section, we identity and explain the most critical of these drawbacks and highlight the gaps that need to be filled in by further research. This paves the way for the objectives of the present study.

The first and for most problem has been that all of the empirical studies under taken so far on the issues used cross-country analysis of LDCs. There are only a few studies on individual country basis (Bowles, 1987). Cross-country analysis of LDCs is an approach in which each country is treated as a sample point assuming, incorrectly, that the impact of foreign aid is constant across countries, that is, the same in all LDCs (White, 1992).

In contrast, the role of aid in the economic transformation of developing countries differs greatly from country to country and has changed considerably over time. (OCED, 1985). Further more, the cross-country approach does not allow for structural differences among countries. Chosen sample of countries

---

channeled into intended projects with low rate of return or no return at all.

could, broadly looked, be homogenous in terms of economic structure and policy reactions. However, these countries differ significantly in their dependence on foreign aid, resource endowments, and domestic policy measures, economic, political, cultural and social structures, institutions as well as their capacities for growth and development. Given all these differences, it is obviously difficult or rather impossible to explain the effect of foreign aid with a single model or single theory and thus recommend a single policy for development, as the cross- country analysis tends to imply.

Past studies with the exception of a few have not distinguished foreign aid by types (grants and loans). Where as these different categories of aid resources are believed to have well differing impact. Analysis, which aggregate them and tend to draw conclusions for aid can easily wrong. Consequently, the separation of the impact of foreign grants from that of loans has been considered as on an area in which further research is beneficial.

SECTION FOUR
ECONOMETRIC ANALYSIS

4.1. Model Specification

The macroeconomic models the specification of dynamic time-series regression equations for national income, domestic saving, government consumption, domestic investment and imports. But for an economic analysis of the performance of development aid in the Ethiopian economy, I specified the model for saving, investment and economic growth. To overcome most of the shortcoming of previous studies in the area, an extensive set of explanatory variables has been taking into account in the formulation of each equation.

4.1.1. Saving Function

Saving is the surplus of income over consumption, which is potentially available for investment. However it is not necessarily realized (Samuelson and Nordhous, 1992). The central importance of saving rates for capital formation and output growth has been emphasized in most discussions of economic development. It is, therefore, essential to understand saving behavior in a LDC's. For this purpose, it is imperative to specify aggregate saving function that could describe the saving phenomenon. Following is an explanation for the functional dependence of saving and justification for the inclusion of each of the variables in the function.

The wide literature on saving in developing countries, both in the Keynesian and life cycle frameworks, explains that there are many determinants of saving. According to current income hypothesis, there is a direct relationship between domestic saving and current income. But income is not the only determinant of saving. Among the other variables, foreign aid has been considered and/or supplementary income sources influencing domestic saving[11]. Much of the discussions of foreign aid in economic development have stressed its catalytic effect in promoting domestic saving from internal resources. This stimulus occurs as foreign aid operates as autonomous investment and opens new opportunities and generate induced saving and investment. In other words, development aid is assumed to generate additional saving as a result of increase in income directly and higher growth rate through aid multiplier effect that it is presumed to induce (Todaro, 1989; White, 1992). If the aid multiplier is sufficiently high, domestic saving with foreign aid inflows can be high so that the relationship between foreign aid and domestic saving in the current period is positive (White, 1989). To the extent this happens, foreign and domestic capital would be complementary rather than competitive in their supply[12].

In contrast to the idea considered above, many authors have adopted the hypothesis that an increase in foreign aid inflows reduces domestic saving. This

---

[11] The propensity to save (or consume) by a country from these sources could be significantly differ.
Foreign aid, as being additional (represent increase) income in the country, believed to influence the propensity to save of the concerned country (Mosley, 1988:P. 168)

[12] The hypothesis here is that foreign aid increases internal savings, because of its promotional effects on domestic efforts, would imply that the regression coefficient on foreign aid positive. However, in a Brazilian case study the foreign capital assumed a negative sign indicating foreign investment and a domestic savings where inversely related during the period 1940-1960 but positively related during the 1947 – 1960 (Leef, 1968). Several other authors have argued that there is a negative relationship foreign aid inflow and domestic savings.

admits the existence of a certain degree of substitutability between foreign aid and domestic saving. Through the same mechanism, it is believed to encourage capital flight. In addition, increasing amount of foreign assistance makes the government of the recipient country to keep tax rates abnormally low or neglect the mobilization of personal saving through the necessary policy and institutional reforms (The economist, 1994). Consequently, foreign aid is believed to reduce domestic saving. So, the overall impact of foreign aid on domestic saving is an empirical question.

Demographic factors may also have an important influence on aggregate saving[13]. In the saving literature, there has been a hypothesis that domestic saving is a decreasing function of dependency ratio. The higher the proportion of very young and very old people to work –age, the lower is the saving rate of a country (Boone, 1994). Therefore, a population factor such as a dependency ratio[14] needs to be included among the explanatory variables in saving function.

Raising revenue through taxation has been viewed as the main source of government saving. Some even remark, "the best way of boosting the level of domestic saving is through taxation", as low tax efforts could promote private consumption expenditure. There are also counter arguments. Increased taxation could depress saving, if the additional tax proceeds are used to finance increased government current expenditures, or if it encourages the illegal flight of capital (Deaton, 1992). It is accepted that reasonable level of taxation, as a means of

---

[13] A country's aggregate savings rate is low, ceteris paribus, to the extent that it has more dependents in its population.
[14] The proportion of retired people plus the very young to the working population

mobilizing domestic resources, of course combined with appropriate government expenditure, could generate additional domestic saving needed to supplement foreign aid for capital formation. The empirical question that arises is to what extent an increase in government tax revenue increase domestic saving? Or what is the relationship between increase in taxes and the level of saving in a country (Boweles, 1994). These theoretical arguments suggest the inclusion of this fiscal variable in a saving function.

The general saving function could, therefore, be written as:

$$S_t = F\{ Y_t, FG_t, FL_t, DPE_t, M_t, TAX_t \} \qquad [4\text{-}1]$$
$$(+)\quad (?)\quad (?)\quad (-)\quad (+)\quad (?)$$

Where; S = total real domestic saving, Y = per capita income, FG = foreign grants, FL = Foreign loans, DEP=dependence ratio; M = money supply, and TAX = taxes. The expected signs of each variable are indicated.

Specifying equation **[4-1]** in logarithmic from, we have an estimable model:

$$\text{Log } S_t = \alpha_o + \alpha_1 \log Y_t + \alpha_2 \log FG_t + \alpha_3 \log FL_t + \alpha_4 \log DE_t + \alpha_5 M_t + \alpha_6 \log TAX_t + e_t \qquad [4\text{-}2]$$

Where e_t is the error term.

4.1.2. Investment Function

In the neoclassical approach, the supply of domestic saving is considered as a direct determinant of investment[15]. This formulation emphasizes the supply side of capital and especially important in LDCs, which commonly face capital shortages. Foreign aids are also accepted to directly provide essential capital goods to promote investment. As in case of saving, the component of foreign aids (foreign grants and loans) is explicitly considered in this study. Aid affects investment the same as public investment is financed out of aid money (Oshikoya; 1994, P. 62). They act, as an increment to investment by easing external finance requires paying for imports of capital goods. The assumption here is that the recipient country's government wants to maximize the rate of growth and directs foreign aid to investment. Foreign aid (and its components) is also asserted, because of its stimulating effects on domestic efforts, to contribute to investment by an amount greater than itself. In this process, the component of foreign aid is said to have different effects on investment. These arguments suggest the need to incorporate foreign aid variable in an investment function

Inflation and general price level can encourage investment by raising the nominal rate of return on investment and by reducing the real rate of interest. This occurs because businesses buy more plant and equipment is more intensively used (Samuelson and Nordhus, 1992). In contrast, inflation is suggested to act as a tax on investment even in the absence of explicit taxation as it increases the cost of

[15] The level of savings in the economy determines the value of funds available for investment purposes, and of

capital goods. Inflation also expected to cause a macro economic uncertainty, which in turn reduce incentive to invest (Samuelson and Nordhus, 1992). In addition, of course, inflation may interact with explicit taxes to further reduced investment.

Taxes are believed to be other important variable influencing investment decision. Increase in income taxes, as it affects the costs of investment directly, lower the net rate of return to private investment making investment activities less attractive. Income (profit) taxes are thus believed to be an important depressant to investment (Samuelson and Nordhous, 1992). On the other hand, in most developing counties taxes make the major source of government revenue and hence influence also positively government investment behavior (Crouch; 1973).

On the basis of the above explanations, real domestic investment function can be specified as:

$$I_t = F\{\underset{(+)}{S_t},\ \underset{(?)}{FG_t},\ \underset{(?)}{FL_t},\ \underset{(?)}{INF_t},\ \underset{?)}{TAX_t}\} \qquad [4\text{-}4]$$

Where: I is Gross domestic investment (fixed capital formation), FG is foreign grants, FL is foreign loans, TAX is taxes, and INF is inflation. As above the expected signs of each variable are indicated in the brackets.

---

course it could be dissaved for consumption purposes.

Transforming Equation [4-3], we have an estimable model:

$LogI_t = \beta_o + \beta_1 LogS_t + \beta_2 Log FG_t + \beta_3 Log FL_t + \beta_4 INF_t + \beta_5 Log TAX_t + U_t$ [4-4]

where: u_t is the error term

4.1.3. Growth Function

The model that will be used in this study is the basic Cobb-Douglas production function. I have, therefore, the production function;

$$Y_t = F(K_t, L_t, A_t) \quad [4\text{-}4]$$

Where: Y_t = Gross Domestic Product, K_t = Capital, L_t = Labor and A_t level of technology.

To endogenize the technology, A_t, let it be represented by level of skill of an individual, H_t, and equation [**4-6**] can be written as:

$$Y_t = F(K_t, L_t, H_t) \quad [4\text{-}6]$$

H_t = Human capital formation which is entering in the same manner as labor augmenting technology.

In Ethiopia, there is no accurate available capital data. Hence, I replace stock of capital by gross fixed capital formation (fixed capital investment), and obtain equation [4-7].

$$Y_t = F(I_t, L_t, H_t). \quad [4\text{-}7].$$

Where, I_t is Gross domestic investment at time t.

The variable I_t can be replaced by its sources of finance including domestic savings

(S_t) and foreign aid proxied by the amount of official development assistance. I thus obtain the following equation [**4-8**].

$$Y_t = F(\ S_t,\ AID_t,\ L_t,\ H_t\ ) \qquad [4\text{-}8\ ]$$

The variable foreign aid (AID) is further decomposed into foreign grants (FG_t) and foreign concessional loans (FL_t) in an effort to see their individual impacts on growth in Ethiopia. This modification gives equation [**4-9**] as follows:

$$Y_t = F(S_t,\ FG_t,\ FL_t,\ L_t,\ H_t) \qquad [4\text{-}9]$$

Following Dollar and Burnside (1997), it is possible to modify equation [4-10] to include a policy variable (PV) which is an index comprised of budget surplus, inflation and openness[17]. y variable has been computed as follows:

0.61x Budget Deficit+0.16x Inflation – 0.23x Openness (X+M/GDP)

Note: The weights have been drawn from growth literature (see *Burnside* and Dollar 1997 for detail)

I postulate that budget deficit and inflation are bad for the economy while openness is good for the economy. There are, I obtain the inverse of openness (thus closeness) to make it uniform with inflation and deficit. Thus, an increase in the co-efficient for the variable PV implies worsening of policies. But in Ethiopia during Derg

[17] *Dollar and Burnside note that, among other factor that promotes long-run growth are opened trade regimes, fiscal discipline and avoidance of high inflation.*

period inflation is controlled by regulation. Hence it did no reflect the real condition of

the economy.

Therefore, we used exchange premium[18] instead of inflation. Then is PV rewritten as:

PV = 0.61xBudget deficit +0.16Exchange premium + 0.23closeness (GDP/X+M)

The equation is also modified to include policy variable (PV). Thus the additional equation [4-10], we have an estimable model:

$$Y_t = F\,[S_t,\ FG_t,\ FL_t,\ L_t,\ H_t,\ INF_t,\ PV_t\ INF_t,] \qquad [14\text{-}10]$$

Thus we can assess the impact of foreign aid (in its disaggregate way) on growth by looking at how the aid coefficient is changing in equation [4-9] and [4-10] or by differentiation the growth function in these equations with respect to aid.

4.2. Estimation Technique And Results

Since the study uses time series data, handling time series economic data, particularly in regression analysis is nowadays becoming almost mandatory to test variables for stationary[19]. If variables entering a regression are not stationary, then results that are obtained using ordinary least squares (OLS) techniques would be spurious in the sense that variables would seem to have causation just because

---

[18] *Exchange premium (EP) defined as: EP=F-P/F, Where F= Official exchange rate, P= parallel exchange rate*

[19] *A time series (or statistic process) is stationary if its mean, variance and auto co variances are independent of time. (Harris, 1995)*

they merely have common trends over time rather than true causation [see Maddala (1992), Harris (1995)]. Therefore, no inference can be made since the standard statistical tests like the F-distribution and t-distribution are invalid.

However, most economic time series variables are not stationary. Thus, the first step is to test whether the variables are stationary (that is, whether they have unit roots). We should find that the variables are non-stationary but become stationary often after first differencing. Such a variable is said to have difference stationary process (DSP). However, some variables may trend upward but along a deterministic line. Such variables are in the category of trend stationary process (TSP), which requires to be detrended. Most economic variables are, however, in the category of difference stationary process.

One possibility is to estimate, using differences of variables (if these differences are stationary). But, such a procedure gives only the short run dynamics while one's interest may be in determining the long run parameters. Thus, there would be a loss of considerable long-run information. In such cases, one has to appeal to notion of co-integration Time series variables may be non-stationary but their linear combination may be stationary. In such cases, we say there is co-integration (long-run relationship) between the variables involved.

Nowadays, there are two major procedures to test for existence of co-integration namely using Engle-Granger two-step procedure, and the Johanse maximum

likelihood estimation procedure. In the Engle-Granger two-step procedure, variables entering the co-integrating vector are tested, for integration of the same order, in fact order one I (1). The first step is to estimate the long-run static model of the I(1) variables and obtain the residual. If this residual, which is the linear combination of the variables or the disequilibrium, is stationary, and then the variables are said to be co-integrated, that is, they do have long-run relationship. The second step in this procedure is to estimate the error correction model (ECM), that is, the first difference of the dependent variable is regressed on the first differences of the explanatory variables with their appropriate lags, and the first lag of the residual obtained in the first step. However, this procedure has two weaknesses in the sense that it first categorizes variables as endogenous and exogenous with an implication of simultaneity problem. The other is the procedure assume that there is one co-integrating vector even for more than two variables involved in the analysis. If the two above condition did not hold, using the Engle-Granger procedure does not give consistent estimates of any of the co-integrating vectors (Thomas, 1997:440). To this effect, the Johansens maximum likelihood estimation procedure is superior. Hence, the proper econometric analysis of this paper follows, this procedure.

4.3 Data Description and Sources

The period chosen for econometric analysis, 1964/65-1999/2000 was to some extent determined by data availability. The data in Ethiopia, like in many other developing countries, has problem both in quantity and quality.

For this analysis, foreign aid (loan and grant) would be relevant. In the first place there is lack of transparency in the responsible organ regarding aid and related matters. For some obscure reasons official figures on aid, particularly foreign grants are very much confidential. The other problem is that there is a significant statistical discrepancy between domestic and external sources. Even though each source independently generates its own data series some areas of inconsistency must be pointed out. To overcome this problem, I consider foreign aid (loan and grant), which enter to capital expenditure. Similarly, human capital formation, which is usually difficult to measure, has been peroxied by primary, and secondary school enrollment rates. The other variable used in this thesis is domestic saving. But, there is a data measurement problem in examining saving behavior at macro-economic levels. Saving is the residual between GDP and consumption, each of it measured with errors (Deaton, 1989).

Dependency ratio would be one of the relevant variables in this analysis. But, there is no readily available data for this variable in Ethiopia. I tried to generate my own series using compound growth rate[20].

---

[20] $Y_1=Y_0(1+r)^t, \Rightarrow Y_1/Y_0=(1+r)^t \Rightarrow \ln(Y_1/Y_0)=t\ln(1+r) \Rightarrow \ln(Y_i/Y_0)/t = \ln(1+r), \Rightarrow e^{Ln}(Y_1/Y_0)=1+r \Rightarrow e^{Ln}(Y_1/Y_0)/t-1=r \Rightarrow 1-r=r_p$

Y1= Active population at censes 1994 Y0= Active population at censes 1984 r = the growth rate of active population between the two censes.

t= Time interval between the two censes. rp= The growth rate of inactive population

In general data for this analysis will be drawn from the national income accounts of Ethiopia as prepared and compiled by the Ministry of Economic Development and Co-operation (MEDaC), the data base of the Ministry of Finance, quarterly and annual bulletins of the National Bank of Ethiopia, various survey reports and statistical abstracts of the Central Statistical Authority, Ministry of Education, and the database of the Ethiopian Investment Authority. Most data on aid will be obtained from Ministry of Finance. Other supplementary or sources will be World Bank and IMF publications.

Stationary and Unit Roots

One important attribute of (a stochastic process) variable is to be stationary and integrated of the same order. For this analysis, variables are required to be stationary at first difference. For stationary and order of integration of all variables in equation [4-2], [4-4], [4-10] and [4-11], unit root test is conducted using Dicky-Fuller (DF) and Augmented Dicky- Fuller (ADF). Both tests shows that all variables entering the co-integration analysis are found to be non-stationary and I (1) series except rate of inflation, which is weakly stationary at 5% level of significance. The results are summarized in Table 4-1 below.

Table 4-1 Unit Root Test

Variables	DF		ADF	
	With drift	With drift and trend	With drift	With drift and trend
$\ln Y_t$	-1.631	-3.028	-1.991	-2.451
$\ln S_t$	-2.494	-3.315	- 1.827	-1.841
$\ln I_t$	-1.262	-0.838	0.395	-1.590
$\ln FG_t$	-1.496	-2.600	-1.171	-2.628
$\ln FI_t$	-1.235	-2.870	-0.707	-2.676
$\ln LF_t$	-1.461	-2.013	-0.874	-1.473
$\ln H_t$	-0.976	-1.329	-2.012	-2.023
$\ln Pv_t$	-0.918	-1.678	-0.398	-0.251
$\ln T_t$	-0.817	-2.575	-0.728	-2.98
$\ln INF_t$	-1.890	-3.564	-3.819	-5.673
$\rho \ln Y_t$	-5.631	-5.540	-3.97	-4.968
$\rho \ln S_t$	-8.669	-8.644	-6.752	-3.260
$\rho \ln I_t$	-3.940	-4.217	-2.978	-3.017
$\rho \ln FG_t$	-6.693	-6.623	-3.202	-3.720
$\rho \ln FI_t$	-4.972	-3.491	-3.071	-5.611
$\rho \ln H_t$	-3.042	-3.549	-2.986	-3.983
$\rho \ln L_t$	-7.231	-7.536	-5.028	-5.781
$\rho \ln Pv_t$	-3.494	-3.492	-3.041	-4.987
$\rho \ln T_t$	-6.275	-6.204	-3.512	-3.479
Critical value at 5%	-2.94	-3.531	-2.945	-3.539
at 1%	-3.612	4.216	- 3.623	-4.232

Co- integration analysis using Johansen's Procedure

The Johansen test and estimation procedure does not set restriction on exogeneity of variables a prior. Similarly, it allows estimating a system of equations instead of single equations. Hence, given both dependent and independent variables, it is possible to represent by vector Z_t and model as an unrestricted vector auto regression (VAR) involve K-1 lags of Z_t.

$$Z_t = A_1 Z_{t-1} + \ldots + A_k Z_{t-k} + \theta D_t + V_t \ldots \qquad [4\text{-}12]$$

Where: Z_t is a vector of non-stationary variables, A_i is vector parameters, D_t is a vector of dummies; v_t is a vector of iid $(0,\eta)$ error terms.

Equation [4-12] can be reformulated into a vector error-correction (VECM) form;

$$\Delta Z_t = \Gamma_1 Z_{t-1} + \ldots + \Gamma_{k-1} \Delta Z_{t-k+1} + \pi Z_{t-1} + \mu + \theta D_t + U_t \qquad [4\text{-}13]$$

In this way of specification, the estimates Γ_t represent short run adjustments, while π_t contains long-run information, D_t represent vectors of dummies, intercepts and predetermined exogenous variable.

There are three alternatives regarding the rank (r) of a matrix. In the first case, r = n, that is, if there is full rank where n is the number of variables entering the co-integration space. This implies that every variable is I (0). Therefore, each variable is co-integrated to itself. In the second case, when r = 0, then there is no co-integration, that is, there is no long-run relationship among the variables involved and estimated by first differences would be appropriate. The third and interesting case, when r < n, it is possible to represent it as $\alpha\beta'$ that is (nxr) vector of long-run parameters and the d(n x r) α matrix represents speed of adjustment to disequilibria. Hence, $\alpha\beta' Z_{t-k}$ in equation [4-12] is equivalent to $\alpha\beta'' Z_{t-k}$ represent up to (n-1) linear combinations (co-integrating vectors) that ensure the convergence of the vector Z_t to their long run steady-state path (see Harris, 1995; Johanes, 1995).

Once the model assumes the last alternative, the first task determines the number of co-integration vector and gets estimates of $\Gamma$and π. In estimating the model represented by equation [4-2], [4-4], and [4-11] data 1964/65-1999/2000 are used and the results are summarized in section 4.3.1, 4.3.2 and 4.3.3.

4.3.1 Estimation Result of Saving Function

As it is shown in table [4-2] both λ_{max} and the λ_{trace} statistics supports the existence of one co-integrating vector.

Table 4-2 Tests for Number of Co-integrating Vectors

Ho: Rank = r	*n-r*	*- T log(1-λ_{r+1})*	*λ_{max}(95%)*	*-TΣ1n(1-λ_i)*	*λ_{trace} 95%*
R = 0	7	67.09**	48.4	148.9**	136.6
R ≤ 1	6	27.57	42.5	81.86	104.9
R ≤ 2	5	22.27	36.4	54.29	77.7
R ≤ 3	4	14.65	30.3	32.02	54.6
R ≤ 4	3	9.659	23.8	17.37	34.6
R ≤ 5	2	7.706	16.9	7.70	18.2
R ≤ 6	1	0.225	3.7	0.2257	3.7

** Rejection at 1% level of significance

Once it is statistically supported that there is single co-integrating vector, then, what is relevant is the first of the row (β' –matrix) and hence the first of the column (α -matrix). Hence, α_{11} represent the speed of adjustment of the first co-integrating vector.

Table 4-3 Test Results of co-integration analysis (PCFIML out put)

(a) Standardized β' Eigenvectors

LS_t	Ly_t	LFG_t	LFL_t	LT_t	Lm_2	$LDPE_t$
1.000	-0.0175	0.0285	-0.0651	0.0230	-0.0044	-0.0194
-0.2041	1.000	-0.1977	0.1604	4.110	-0.3234	0.110
0.326	-0.046	1.000	0.289	0.438	17.29	0.892
-0.5073	7.356	0.0539	1.000	-5.800	3.903	-0.800
0.0026	-0.05016	-1.645	0.0812	1.000	-0.1897	0 .085
0.06214	-0.4342	-0.05377	0.0713	2.085	1.000	1.27
0.0682	-1.082	0.2790	0.1216	15.27	-0.3128	1.000
(b) Standardized α coefficients						
LS_t	-0.4797	1.509	-0.0115	0.0805	0.0378	0.0607
Ly_t	-0.3303	-0.1274	-0.0014	-0.0114	0.1686	0.0182
LFG_t	-0.2958	-1.248	-0.0146	0.1225	2.740	-0.1831
LFL_t	-0.2107	-1.611	-0.0116	-0.0078	-0.8639	-0.1694
$LDPE_t$	0.5058	-0.0135	-0.0001007	0.0006	-0.0054	-0.0001
LT_t	0.3458	0.4550	0.000107	-0.0208	0.3398	-0.0525
Lm_2	-0.4137	-0.0335	0.0016	0.0025	0.1418	0.0075

Diagnostic Test

Vector AR 1-2F(98,40) = 2.4108(0.1674)

Vector Normality χ^2 (12) = 20.69(0.1550)

One task of this approach is a test for weak exogeneity. For this purpose, the test is conducted by imposing a zero-restriction on the α-coefficients of the first column using LR-test and the results are summarized in table 4.1.1 of appendix.

The test does not reject the null at 5% level of significance for explanatory variables. Thus, the single equation model with the estimates of the long-run coefficients can be written as:-

$$LS_t = 0.0175LY_t - 0.0285LFG_t + 0.0651LFK_t - 023LT_t + 0.0044Lm_2 + 0.0194LDEP_t$$

(30.17) (11.35) (13.79) (1.285) (14.57) (1.425)

(0.000)** (0.000)** (0.000)** (0.0082)* (0.000)** (0.257)

** Rejection at 1% level significance

* Rejection at 5% level significance

The long –run coefficients of the respective variables should be tested for 'significance' to determine the variables, which uniquely constitute the co-integrating vector. Then, a zero-restriction is imposed on each coefficient and the results for the LR-statistics are indicated in parentheses.

According to the results, the grant component of foreign aid entered the saving function that took a significant negative coefficient. This implies that with the increase in the inflows of grants, a country's domestic saving tended to decline during the period under consideration. Such an adverse effect of foreign grants on domestic saving could be due to the fact that increased receipts of foreign grants encourage current consumption. This makes the argument valid, in that increased grant substituted own efforts to mobilize domestic saving.

The loan component of foreign aid entered the equations that have positive and statistically significant coefficients. This suggests that the favorable impact of foreign loans on domestic saving. The result support the theoretical discussions on foreign aid that have stressed its role in economic development with its catalytic effect in promoting domestic saving from internal resources.

Per capita income assumed that a positive and significant coefficient indicating its favorable effect on domestic saving. This suggests that an increase in a country's income has tended to promote domestic saving. On the other hand, the financial

depth has positively influenced domestic saving. Dependency ratio has a positive sign and insignificant, contrary to the expected negative sign.

The existence of long run relationship is statistically verified and the associated long-run parameters are determined. To complete the analysis, coefficients of the short-run dynamics should be determined. Using the general to specific modeling approach of David Hendry the parameters can be estimated as:

$$\Delta \ln S_t = \sum_{i-1}^{k} \Gamma_i \Delta \ln S_{t-1} + \Gamma_i \Delta Z_{it-i} + \phi D_t + \alpha CIVE_{t-1}$$

Where $\Delta \ln s_{t-1}$ = change in lag of gross domestic saving, i = 1, . . . k is the number of lags, ΔZ_{t-i} is a vector of differences of variables than GDS, and $CIVE_{t-1}$ contains the error correcting term.

Since one co-integration vector is supported and zero restriction on α- co-efficient do not reject the null (weak exogeneity) for all explanatory variable, the short run dynamic has been estimated using ordinary least squares (OLS) technique. The result is summarized in table [4-4].

Table 4-6 Results for the ECM

Dependent Variable DLS_t

Variable	*Coefficient*	*Std..Error*	*t-value*
Constant	2.57	0.8106	3.170
DY_t	0.0048	0.0148	2.915
Dm_2	0.0135	0.01216	2.755
DLT_t	-0.0204	0.1119	-1.833
DLT_{t-1}	-0.0071	0.0342	-1.645
$CIVE_{t-1}$	-0.4820	0.165	-2.915

R2 = 0.51 F(4,25) – 7.91 DW = 1.84

Diagnostic Tests

AR1-1F(1,24) = 0.5897[0.4500]
ARCH 1F (1,23) = 0.9154[0.3486]
Normality χ^2 (2) = 0.229[0.5697]
X^2 F(8,6) = 0.9142[0.3270]
Xi*Xj F(14,10) = 0.2313 [0.2146]
RESET F(1,24) = 0.1253 [0.1794]

The diagnostic tests reported above show that the saving equation is reasonably acceptable. It is evident that the adjusted R square coefficient of determination (50 percent) of the equation was reasonably high for transformed variables. Moreover, the calculated F-statistic was 8.91 and significant at one percent level, indicating that the variables included in the equation were important in explaining domestic saving. In both models, the coefficient of the vector error correction term is significant with expected sign and reasonable magnitude (-0.48), which approximates the coefficient in the first row of the α_{11} - matrix.

The result shows that, in the short run, the most important determinants of real

domestic saving are the per capita income, financial depth and Tax rate. The foreign aid is (grants and loans) with expected sign, but it is statistically insignificant.

4.3.2 Estimation Result of Investment Function.

Similar to the saving function, for investment function the existence of co-integration vectors has been tested. The result is summarized in tables table [4-5].

Table 4-5Test for Number of Co-integration Vectors

Ho: Rank = r	*n-r*	*- T log(1-λ_{r+1})*	*λ_{max}(95%)*	*-TΣ1n(1-λ_t)*	*λ_{trace} 95%*
R = 0	7	61.68**	45.3	143.2**	124.2
R ≤ 1	6	31.94	39.4	51.52	94.2
R ≤ 2	5	22.94	33.5	49.57	68.5
R ≤ 3	4	12.62	27.1	26.91	47.2
R ≤ 4	3	8.26	21.0	14.29	29.7
R ≤ 5	2	4.70	14.0	6.02	15.4
R ≤ 6	1	1.32	3.8	1.32	3.8

** Rejection at 1% level of Significance

Table 4-6 Results of Co-integration analysis (PCIIML out put)

(a) standardized 'β' Eigenvectors

LI_t	LS_t	LFG_t	LFL_t	INF_t	LT_t
1.00	-0.0768	0.00785	-0.0795	0.0881	0.0315
134.0	-65.95	-13.24	-0.8261	1.000	-46.73
0.3567	1.000	0.5027	0.8945	0.1275	-2.303
-0.3387	0.4153	1.000	-9.626	-0.005007	1.429
-0.9792	6.038	-3.152	1.000	-0.0775	1.008
0.4995	-0.2306	0.1614	-0.1706	0.001949	-0.6729
-0.9172	0.3863	0.04032	0.1588	-0.002035	1.000

(b) Standardized α - Coefficient

LI_t	0.42907	-0.0048	-0.0594	-0.1646	-0.0387
INF_t	-0.007	-0.1473	-3.031	0.3066	0.6768
LS_t	-0.0129	0.0033	-0.1385	-0.0577	-0.0219
LFG_t	-0.0572	0.01067	-0.1352	-0.1631	0.04092
LFL_t	-0.0566	0.0014	-0.1304	0.1017	-0.0003
LT_t	0.0415	0.0012	0.0295	-0.0019	0.0028

Diagnostic Test

Vector AR 1-2F(98,40) = 2.4108(0.1674)
Vector Normality $X^2(14)$ = 5.73 (0.1871)

In table 4-5 above, both λ_{max} and the λ_{trace} statistics support the existence of one co-integrating vector. Hence, the first column of the α'- matrix and first row of the β – matrix is relevant. Then, α_{11} represent the speed of adjustment to disquilibrium. Tests for vector serial correction and normality are conducted and these tests do not detect serial correction and normality problem at best.

Both, weak exogeneity and significance of long-run coefficient test conducted by imposing a zero –restriction on relevant coefficient using LR-test and the results are summarized indicated in parentheses as well in appendix 4.2.1 and 4.2.2.

As indicated in appendix, the zero restriction on α- coefficient do not reject the null. Thus, the single equation model with the estimates of the long-run coefficients (elastic ties) can be written as:

$$LI_t = \underset{(6.585)\ (0.000)^{**}}{0.0568LS_t} - \underset{(5.150)\ (0.000)^{**}}{0.0278LFG_t} + \underset{(18.02)\ (0.000)^{**}}{0.0195\ LFL_t} - \underset{(3.190)\ (0.000)^{**}}{0.0315LT_t} - \underset{(6.580)\ (0.000)^{**}}{0.0081\ INF_t}$$

** Rejection at 1% level of significance

According to above the results, the foreign loans component of foreign aid is found to be positive and significant. As foreign loan inflows increase, the level of real domestic fixed capital formation also increased. This tend to indicate that foreign loans have been used to finance imports of investment goods, besides promoting domestic saving, which in turn have also contributed to domestic capital formation. The grant element of foreign aid assumed to have a negative and insignificant coefficient. This suggests that foreign grant's direct effect on gross domestic capital

formation was statistically negligible during the period under consideration. The lack of influence by foreign grants on domestic investment is consistent with their insignificant negative effect on real domestic saving.

Real domestic saving also entered this investment equation with a positive and significant coefficient. This illustrates that domestic saving, as theoretically expected, has promoted the country's domestic capital formation. The other variables, namely tax rate and inflation, had the same signs of influence and statistical significance as discussed in the previous investment equation.

In the Johansen approach, the last task is estimating coefficients of the short run dynamics using the general to specific modeling approach. In this particular model in which one co-integration vector is supported and the variables are weakly exogenous the short run dynamics is estimated using ordinary list square (OLS) techniques and the results are summarized in table [4-7].

Table 4-7 Results for the ECM

Dependent variable DLI_t

Variable	Co-efficient	St. Error	T. tratio
Constant	2.5701	0.8106	3.170
DS_t	0.01779	0.0007	2.755
$DINF_{t-1}$	-0.0144	0.00927	-1.564
DLT_t	-0.0651	0.0234	-2.833
DLT_{t-1}	-0.0214	0.2034	-1.650
ECM-1	-0.41205	0.1415	-2.915

R= 0.41

F(45251)= 4.914

DW= 1.97

Diagnostic Test

AR 1-IF(1,24) =	0.5897	[0.4500]
ARCH1F (1;23) =	0.9154	[0.3486]
Normality χ (2) =	1.229	[0.1874]
X^2 F(8,16) =	0.9142	(0.2351]
Xi* Xj F(14,10) =	0.8643	(0.2618]
RESET F(1,24) =	1.5352	(0.1718)

* Rejection at 5% level of significance

** Rejection at 1% level of significance

The diagnostic test reported above show that the investment short run equation is quite acceptable. The over all fit as represented by the R squares is quite good for transformed variables. The result shows that in the short run fixed capital formation (proxied by investment) is determined by real domestic saving and tax rate (including its past value). In both models the speed of adjustment mechanism (the ECM term being 41%), which indicates nearly half of the deviation of the previous rate of investment from its equilibrium is made up in the current period.

4.2.3 Growth

Like to the above saving and investment, a test for number of co-integrating vectors is held. As its evident from table [4-8], both λ_{trace} and λ_{max} tests for reduced rank

indicate that it is possible to reject the null for no co-integration at both the 1% level of significance.

Table 4-8 Tests for Number of Co-integrating Vectors

H_o: Rank=r	n-r	$-Tlog(1-\lambda_{r+1})$	λ_{max} (95%)	$-T\sum log1-\lambda_t$	λ_{trace} (95%)
R=o	8	268.3**	51.4	383.8**	156.0
R≤1	7	33.08	45.3	115.6	124.2
R≤2	6	26.78	39.4	82.5	94.2
R≤3	5	23.2	33.5	55.72	68.5
R≤4	4	18.41	27.1	32.51	47.5
R≤5	3	9.679	21.0	14.11	29.7
R≤6	2	3.626	14.1	4.428	15.4
R≤7	1	0.8025	3.8	0.8025	3.8

**Rejection at 1% level of significance

Table 4-9 Results of co-integration analysis (PCFIML out put)

(a) Standardized B' Eigenvector

Ly	LS_t	INF_t	LFG_t	LFI_t	LH_t	LLFt
1.000	-0.03269	0.004679	0.06971	-0.08030	-0.0996	-0. 3730
2.287	1.000	-0.8959	-1.981	-2968	-2.972	-0.8967
18.68	19.724	1.000	23.67	-34.37	19.26	14.87
-0.9170	-2.23479	0.3911	1.000	-1.877	0.7905	-0.4159
-3.156	-1.51220	-0.02479	0.02413	1.000	0.4991	-0.002107
-2.150	-7.643	-0.01220	15.68	-12.78	1.000	0.002914
1.672	0.8577	0.01267	0.9324	-1.806	0.2182	10000

(b) Standardized α coefficients

LY_t	-0.521261	0.003263	-0.0004192	-0.00179	-0.02272	-0.0002984
LS_t	-0.004197	-.01176	0.002039	-0.05762	-0.1642	0.0003175
INF_t	0.09176	-0.01679	-0.02718	-1.528	4.757	-0.02776
INF_t	0.008781	0.06524	0.002633	-0.03818	-0.1608	0.02318
LFL_t	0.01154	0.08053	0.002581	-0.0256	-0.8810	0.006102
LH_t	-0.0002987	-0.1307	-0.007423	-0.09871	-0.1931	0.002518
LLF_t	0.3650	-0.00291	-0.0001145	0.004963	-0.00520	0.0004036

Diagnostic Tests

Victor AR 1 F(98,40)= 9.8457 [0.18970]
Vector normality chiy (14)= 38.645(0.2456).

Similarly, the result of co-integration analysis is summarized in table [4-8]. As the result indicates, tests for vector serial correlation and normality are conducted and

these tests do not detect any serial correlation and normality problem at 5% level. But, the degree of freedom did not allow testing for vector hetrosedasticity and auto regressive conditional hetrosedasticity. However, tests after dropping a variables or decreasing the number of lags showed the absence of such problems.

The test for zero restrictions on α-coefficients rejects the null (see appendix 4.3.1). Thus, the single equation model with estimates of long run coefficient can be written as:

$$\ln Y_t = \underset{(27.09)\ (0.000)^{**}}{0.03269LS_t} \; \underset{(2.076)\ (0.000)^{**}}{0.0046INF_t} - \underset{(20.16)\ (0.000)^{**}}{0.06971LFG_t} - \underset{(10.61)\ (0.000)^{**}}{0.0803LFL_t} + \underset{(0.812)\ (02140)}{0.09912LH_t} + \underset{(0.671)\ (0.228)}{0.3730LLF_t}$$

**Rejection at 1% level of significance

The consideration of individual explanatory variables reveals that the capital financed from domestic resources calculated a positive co-efficient, which was highly significant. This suggests that investment financed from domestic funds had a favorable influence on the country's real aggregate out put. It is evident from standardized beta co-efficient that this capital category was the important contributory input influencing growth of domestic output.

The empirical results further show that the capital financed from loans had an estimated coefficient with a positive and statistically significant. On the other hand, the coefficient of the investment financed from foreign grant was negative and significant. This result reveals that foreign grants had adverse influence on per capita income during the period under the study. One of the most probable reasons

for such effect of this capital item could be the inefficiency with which they have been used in the economy.

The coefficient of economically active labour force was positive and insignificant. This suggests that human labour has not been one of the important inputs influencing the country's real domestic out put. Similarly, human capital which proxied by primary and secondary enrollment ratio has a positive sign, but statistically insignificant.

Following Dollar and Burnside (1997), I set a policy variable (PV) index as explained earlier comprised of budget surplus, exchange premium and openness. Here, I am testing the hypothesis that good policies improve aid effectiveness. The result for equation 10 showed that though policy index was introduced the number of co-integration vector remained the same. The test for weak exogeneity is acceptable for explanatory variable (see appendix 4.3.1 and 4.3.2).

The long run reduced form reported as follow:

$$Ly_t = \underset{(36.284)\ (0.000)^{**}}{0.275\,LS_t} - \underset{(244.10)\ (0.000)^{**}}{0.0841LFG_t} + \underset{(262.57)\ (0.000)^{**}}{0.017LFL_t} + \underset{(0.3457)\ (2.3970)}{0.005LH_t} + \underset{(2.0782)\ (0.2748)}{0.3236LLF_t} - \underset{(266.62)\ (0.024)^{*}}{0.0442INF_t} - \underset{(243.413)\ (0.000)^{**}}{0.068PV_t}$$

**Rejection at 1% level of significance
*Rejection at 5% level of significance

As we understand from the reduced form equation and test for significance of coefficient the coefficients for labour force and human capital are positive and

insignificant though they have the expected signs. The coefficient for the variable PV is negative and significant at best. This implies that growth of out put reduced with poor or bad economic policies as an increase in PV implies worsening of policies. The coefficient for grants and loans are significantly negative and positive respectively. Comparing these coefficients with that of equation 9 above, the negative impacts of grants increase while the positive impact of loans decrease. This implies the effectiveness of foreign aid reduce after introducing policies in the model. The coefficient for saving is significant and positive. To complete the analysis the short run dynamics result is reported in the table below. In this case I consider two alternatives. The first one is with out introducing police variables and the other one is with policy variable

Table 4-10 Results for the ECM

Dependent Variable is DLYt

Variable	*Coefficient*	*t-value*	*Co-efficient*	*T—value*
Constant	2.804	3.465	2.705	2.77
DLY_t-1	0.2747	1.974	0.178	2.35
DLS_t	0.0275	2.478	0.003	2.89
$DINF_t$	-0.00218	-2.026	-0.032	-1.68
$DINF_{t-1}$	-0.00145	-1.866	-0.727	-2.43
Cve_{1-1}	-0.52218	-3.734	-0.327	-2.47

Diagnostic Tests

R = 0.60
F(6-22) = 8.62
DW = 1.94
AR 1-1F(1,22) = 0.05496 [0.8168]
ARCH 1F(1,21) = 1.0641 [0.3140]
Normality $X^2(2)$ = 1.7094 [0.4254]
X^2 F(11,11) = 0.5298 [0.8465]
RESET F(1,22) = 1.0713 [0.3119]

R2 = 0.43
F(6,25) = 8.2
DW = 2.07
AR1-1F(1.24) = 0.042[0.839]
ARCH 1F(1,23) = 05091[0.482]
Normality X2(2) = 2.501[0.286]
XiXj; F(12,12)=2.638[0.053]
RESET F(1,24)=0410[0.527]

The fit of the growth equation is quite acceptable as measured by the adjusted R squares and F-statistic significance. In the short run growth model, growth determined by real domestic saving, which is domestic finance of investment and macro –economic instability, measured by the rate of inflation. In the short run growth model, foreign finance of investment had similarly signs with long run, but statistically insignificant. In both the long and short run model the speed of adjustment is negative and significant. It shows feed back of approximately 52% of the previous years disequilibrium from the long run of explanatory variables.

SECTION FIVE

5. Conclusion and Policy Implications

5.1 Conclusion

The main objectives of this thesis have been to examine the impact of foreign aid in its disaggregate form, on domestic saving, investment and economic growth. Both descriptive statistics and formal estimation using Johansen maximum likelihood techniques are employed to investigate the impacts. The main conclusion and policy implications could be summarized as follow:

One of the conclusions is that a foreign loan, which has been among important factors positively influencing Ethiopian's gross domestic saving. However, foreign grants had negative impact on domestic saving suggesting that they have financed immediate expenditures. There is empirical support for positive effect of income on long run domestic saving. The main conclusions that have emerged from the short run analysis of the determinants of domestic saving are per capita income, financial depth, proxied by M_2 and tax rate. The other variables (namely, components of foreign aid, loans and grants, all have the right sign and are statically significant.

The analysis in this study leads to the conclusion that foreign loan has fostered the country's gross domestic fixed capital formation (a proxy of investment). Foreign loans have significantly contributed to domestic investment as they did to domestic saving. However, foreign grants had negative impact though it is statistically insignificant. In the short run, investment in Ethiopia is determined by domestic

saving. Moreover, in line with the theoretical inflation and tax rate were also found to be significant determinants of investment.

From the empirical results on determinants of growth, the following conclusions could be summarized. Among the key findings is that domestic finance of investment (domestic saving) has a strong positive and significant impact. On the other hand, a foreign grant, which is component of foreign finance, has a negative and significant impact on growth of output. In contrast to grants, foreign loans have positive and significant impact. In the short run, foreign finance did not contribute for investment. The lesson from this is that the government should strength its responsibility in encouraging domestic saving rather than foreign aid.

Another finding in our study is labour force and human capital have a positive but insignificant relationship with growth. This implies that the two variables cannot be used to examine growth in Ethiopia. Inflation rate negatively and significantly influenced the growth of out put.

In the short run growth of out put is determined by domestic saving and macro-economic instability as measured by the rate of inflation; while the contributions of foreign finance (loans and grants) are weak at best.

Finally, after incorporating a policy variable (PV), which is an index, comprised of budget deficit, exchange premium and the economy's closeness into our model, the signs and significance are the same as before. But the coefficient declined. I conclude that poor policies affect growth negatively. However, we recall that the role of this variable in our model is to test the hypothesis as that aid effectiveness on growth increases in the presence of good or sound economic polices. I may accept this hypothesis as justified by comparing our results in equation 4-10 and 4-11.

5.2 Policy Implications

The study has provided empirical evidences on the Impact of foreign aid at its disaggregate level on the domestic saving, investment and economic growth. These empirical findings highlight a number of useful policy and theoretical implication for development.

One immediate implication of the analysis is that foreign loan had a positive impact on domestic saving, investment and out put growth. This suggests that increasing inflow of foreign loan is critical in rising domestic saving, fostering investment and increasing out put. Although capital financed from foreign grants was important capital item through out the models, it has assumed a negative effect on saving, investment and out put. This could also be explained by the inefficient use of this capital during the period under study. It is vital to efficiently use this capital input in order to reverse its adverse effect on saving, investment and growth of out put.

The other implication of this study reveals that income and financial depth, proxied by money supply. Income and financial depth influence domestic saving positively. The policy implication is to maintain a sustainable domestic saving in Ethiopia, which might be important to put much effort on increasing out put, improving access to financial institutions could increase magnetization of the economy.

Inflation rate is one of the variables influencing saving, investment and out put. Hence the government should avoid high inflation by probably targeting the factors known to push inflation up, factors such as increased money supply through printing more money. Thus there is a need for the government to practice sound monetary policies.

Last, the government ought to practice sound fiscal discipline. For a long time, Ethiopia has had unsustainable budget deficits. This calls for a positively need to cut down expenditures and improved on avenues of revenues collection of which taxation is the major one. For this to be achieved the government has to come out clean by eliminating corruption and observe strictness in tax collection (there is high tax evasion).

BIBLIOGRAPHY

Abbott, George C. (1979): International Indebtedness and the developing countries. London: croom Hell.

Alemayehu and Befekadu (1991): Managing Transition from Aid Dependence in Ethiopia; paper prepared for presentation at the workshop on managing transition from Aid in Africa, Nairobi, June 1998 A.A.

Bacha, Edmar L, (1990): "A three Gap model of Foreign transfers and the GDP growth Rate in Developing Countries", Journal of Development Economics Vol. 32

Balassa, Bela, (1990): "Incentive policies and Export performance in sub-

Boweles, P. (1987): "Foreign Aid and Domestic savings in less Developed countries: Some tests for causality," World development.

Boone, P. (1994): "the impact of foreign Aid on saving and growth," London school of Economics.

Burnside .G & Dollar, D (1997): Aid, Policies and Growth, Macro economics and policy research, department, World Bank.

Cassen, Robert and Associates, (1988): Does Aid work: Reported on an

Chenery, Hollis B., and M. Burno. (1962): "Development Alternative in an open Economy: The case of Israel", The economic journal. Vol. IXXII, No. 285.

Chenery, H.B. and strong, AM. (1966): "Foreign Assistance and Economic Development", American economic reviews; vol. 56, No. 4.

Clark, Don P, (1991): Trade versus Aid: Distribution of third World development Assistance, " Economic development and cultural change, vol. 39 No.4.

Coher, M. John, and Nils-lvar isaksson (1988): " Food production strategy debates in Revolutionary Ethiopia." World Development, Vol. 16 No. 3.

Deaton, A. (1989): " Saving in Developing countries: Theory and Review," proceedings of The World Bank Annual conference on Development Economics (1992): "Saving and Income smoothing in cote D'Ivoire "Journal of African Economies "1(1).

Dejene Aredo (1989): "Famine causation, food aid and foreign financial assistance to Agriculture in Ethiopia", In national workshop on food strategies for Ethiopia, Alemaya.

EEC, (1990): Ethiopia and the European community, Commission of the European communities, Brussels.

Elbadawi, I.A. and R.M. Mwega (1998), "Can Africa's saving collapse Reverted? " A paper prepared for the World Banks project on "saving Across the World: Puzzles, and Policies".

Fischer, Gunther, et al Linked national Models (1988): A tool for international

Gbas, Jean-Jacques, (1993): Aid and development where the Twain shall

Griffin, Keith; (1970): Foreign capital, Domestic savings and Economic development," Bulletin of the oxford University, Institute of Economic and statistic vol. 32.

Griffin, K and J. Enos (1970): "Foreign Assistance, objectives and consequences", Economic development and cultural change, vol. 18.

Gulati-c-u. (1976): foreign Aid, savings and growth: some further evidence. The Indian economic journal, vol. 24.

Haile and Alemayehu (2000): Saving foreign aid and Economic growth: A review of the theory and the existing evidence, prepared for the tenth annual conference on the Ethiopian Economy.

Hanisch, Rolf, (1993): Does Foreign aid Develop?" The lessons from Africa, "Quarterly Journal of international Agriculture vol. 32 No. 1.

Harris, Richard (1995): Using cointergration Analysis in Econometric Modeling, Printce-hall.

Islam, A. (1992): Foreign Aid and Economic Growth: Econometrics study for Bangladesh. Applied Economics vol. 24.

Johansen, soren (1995): Likelihood-based Inference in co-intergrated vector Auto-Regressive model, Oxfoi d university press.

Jempa, catrinus, J. (1993): The tying of aid, OCED: Development studies centre.

Korn, David A. (1986): Ethiopia the united states and the Soviet Union. USA: Southern Illinos University press.

Krueger, Anne O, (1987): "Debt, capital flows and LDCs growth," The American Economic Review, vol. 77 No. 2.

Krugman, paul R. And Maurice obstfelel. (1987): International Economics, theory and policy (2nd ed), Harper collins publisher in C. New York.

Leuy, victory. (1988): "aid and Growth in sub-Saharan Africa; the recent experience, European Economic Review vol. 32. No. 9.

MEDaC: National Income Accounts of Ethiopia, Revised

MOF : Minister of Finance, Date Base

Maddala, G.S. (1992): Introduction to Econometrics, Macmillan, New York.

Mbaku, J.M. (1994): The impact of Foreign aid and Economic Growth in Cameroon. Applied Economics, vol.25.

Mende, Jibor. (1973): From aid to Re-colonization lessons of Failure. London: George G. Harrap and Co. Ltd.

Moscy.P. (1980): Aid, Saving and Growth: Revisited bulletin of Oxford University, Institute of Economics and statistics vol. 42.

Pananke, G.F. (1972): The effect of Aid and other Resource Transfers on savings and Growth in less Developed countries. Economic Journal.

Resensetein-Rodens P.N. (1961): "International aid for under developed countries," Review of Economic and statistics, vol. 43 No.2.

Riddel, Roggere (1987): Foreign aid Reconsidered London, james Curry.

Saluatore, Dominick (1990): theory and problems of International Economics 3rd ed. Mc Graw Hill, inc, inc New York.

Samuelson, Dominick and W.D. Nordhous (1992): The Economics, McGraw-Hill International editions.

Tadaro, Michael P. (1989): "Foreign Investment and Aid: Old controversies and new opportunities" In economic Development in the thired World, New York.

The Economist- (1993): The world has got itself in to a muddle over foreign Aid.

UNDP ,(1991) Annual Report

Weisskopf, Thomas E. (1972): "The impact of Foreign capital inflow on Domestic Savings in under developed countries", Journal of International Economics, Vol. 2.

White, Howard. (1992): "the Macro economics impact of development aid: A critical survey; Journal of Development studies, 28(2).

_____ (1993): "Is Development Aid Harmful to Development", the courier, No. 134

World Bank (1994): Adjustment in Africa reform, results and the Road Ahead, World Bank policy Research Report (New York: Oxford University press).

Appendix 1- Government capital Expenditure In Million Birr

SECTOR	1985/86-1990/91 Average	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98
Total Capital Expend.	1482.3	951.8	1785.0	2694.4	3156.5	3562.5	4299.9	4265.1
Economic Development	1345.3	841.5	1501.1	1974.8	1446.5	2618.7	3000.5	2451.2
Agriculture	335.6	242.0	323.7	373.3	292.3	357.7	277.2	376.2
Mining & Energy	298.4	139.5	146.3	251.4	267.5	381.4	796.0	423.0
Natural resources	234.1	152.2	315.5	347.8	464.5	423.2	513.2	464.1
Industry	211.9	146.5	310.5	264.5	326.9	356.3	286.1	93.2
Rade & Tourism	10.1	-	7.4	3.7	1.4	0.5	0.3	1.5
Transport construction	93.9	61.2	196.2	414.5	749.6	676.6	742.1	898.5
Transport & communi.	119.9	67.5	139.8	260.0	185.3	216.0	385.5	194.7
Financial Agencies	29	32.6	61.7	59.6	158.9	207.1	0.0	0.0
Social Development	102.9	91.2	257.8	621.0	507.5	712.0	843.5	1013
Education	43.7	38.2	141.2	256.0	269.2	441.9	421.9	436.8
Health	35.7	37.4	66.6	68.6	119.9	153.9	251.8	276.9
Urban Dev't & Housing	17.8	13.8	24.8	160.8	109.5	99.5	144.8	204.7
Social Welfare	3.1	1.4	22.9	130.3	2.9	10.2	12.7	81.2
Culture & Sports	1.9	0.4	1.7	5.3	5.8	6.6	12.3	13.7
GNERAL SERVICES	29.8	15.3	22.5	80.6	187.0	218.7	293.1	291.6
Compensation Payment	4.15	3.8	3.6	18.0	15.5	13.1	12.8	14.0

APPENDECICE 2- Test for zero restriction of B and α coefficient of saving funciton.

	Ly_t	LFG_4	LFL_t	$LDPE_t$	LT_x	LM_2
α-Coefficient	-0.3305	-0.2958	0.2107	0.5058	-0.3458	0.40137
LR-test χ^2 ($\approx$1)	-0.1712	0.2029	1.7904	0.8916	0.1013	0.4526
p. value	0.1406	0.6524	0.1809	0.2617	0.2940	0.5011
	LY_t	LFG_t	LFL_t	$LDPE_t$	LT_t	LM_2
β-Coefficient	0.0175	-0.0285	0.0651	0.0194	-0.0230	0.004
LR-test χ^2 ($\approx$1)	30.17	11.35	13.79	1.425	1.281	14.57
p. value	0.000**	0.000**	0.000**	0.257	0.0082*	0.000*

*Rejection at 5% level of significance

APPENDECICE 3- Test for zero Restriction on B and α-coefficient for investment function.

	INF_t	LS_t	LFG_t	LFL_t	LT_t
α-Coefficients	0.0071	0.0128	-0.0574	-0.056	0.0414
LR-Test X^2(~1)	3.195	0.8087	0.5978	1.369	0.1053
P-Value	0.6739	0.7762	0.4411	0.2420	0.7455

** Rejection at 1% level of significance

	INF_t	LS_t	LFG_t	LFL_t	LT_t
B-Coefficient	-0.0881	0.0768	-0.0278	0.0795	-0.0315
LR-Test $X^2(\sim1)$	6.5850	5.1501	18.0217	3.1906	20.57
P-Value	0.000**	0.000**	0.000**	0.000**	0.000**

** Rejection at 1% level of significance

* Rejection at 5% level of significance.

APPENDECICE 4- Test for Zero Restriction on B and α- coefficient of growth

	LS_t	LFG_t	LFL_t	LH_t	LF_t	INF_t
α-Coefficient	-0.3269	0.0046	0.06971	0.0803	0.09966	-2.732
LR-test χ^2 (≈1)	0.0975	0.0764	0.1629	0.6105	0.0174	0.2897
p. value	0.7548	0.7821	0.6865	0.4346	0.9895	0.6767

**Rejection at 1% level of significance

	LS_t	LFG_t	LFL_t	LH_t	LF_t	INF_t
β-Coefficient	0.3241	0.0046	0.0697	0.08030	0.996	-2.732
LR-test χ^2 (≈1)	27.572	2.3876	20.4714	0.81201	0.6770	203.16
p. value	0.0000**	0.0000**	0.0000**	0.2140	0.22831	0.0000**

**Rejection at 1% level of significance

Appendix 5- Test for Number of Co-integration Vectors

H_o rank = r	n-r	-T log (1-λ_{r+1})	λ_{max}(95%)	-T Σlog(1-λ_t)	λ_{trace} 95%
$r \leq 0$	8	288.4**	57.1	432.2**	191.9
$r \leq 1$	7	34.49**	51.4	143.7**	156.0
$r \leq 2$	6	31.03*	45.3	109.2	124.2
$r \leq 3$	5	27.82	39.4	78.2	94.2
$r \leq 4$	4	25.19	33.5	50.37	68.5
$r \leq 5$	3	12.54	27.1	25.19	47.2
$r \leq 6$	2	8.53	21.0	12.65	29.7
$r \leq 7$	1	3.54	14.1	4.16	15.4

** Rejection at 1% level of significance.

Appendix 6 - Results of Co-integration Analysis (Pcfiml out put.)

Lyt	LSt	LFGt	LFLt	LH_t	LLF_t	INF_t	PVt
1.00	-0.275	0.084	-0.017	-0.051	-0.3238	-0.005	0.068
-0.428	1.00	-0.172	0.047	-0.183	-0.334	-0.014	0.234
-0.095	5.483	1.00	-1.716	2.467	-1.404	0.010	-0.001
-0.604	0.357	-0.734	1.00	0.513	0.846	0.017	-0.635
0.241	-3.624	0.349	-0.977	1.000	-0.131	-0.048	-.024
-0.566	-6.197	0.116	2.320	6.221	1.000	1.000	-0.578
-0.429	-1.905	1.976	-1.772	0.425	-0.105	0.708	1.000

Lyt	0.315	0.738	-0.042	-0.004	-0.0934	0.245	0.184
LSt	1.501	0.070	-1.533	-0.153	-0.103	0.004	0.324
LFGt	-0.049	0.559	-0,125	-0.017	-0.013	0.028	0.004
LFLt	-0.118	1.521	0.882	-0.407	1.721	-0.035	-0.023
Ltl_t	0.014	0.875	-0.173	-0.062	-0.081	0.056	-0.113
LLf_t	-0.006	1.203	-0.231	-0.017	-0.303	0.248	-0.178
INF_t	0.443	-1.752	0.055	-0.173	-0.133	0.770	-0.140
PVt	0.150	-5.069	0.122	0.018	0.169	0.028	-0.007

Vector AR 1-2F (17,6) = 73.36 (0.421) Vector normality X^2 (18) = 25.95 (1.141)

	LSt	LFGt	LFLt	Ltl_t	LLf_t	INF_t	PVt
α-co-efficient	1.501	-0.049	0.118	0.014	-0.006	0.443	0.150
LR-test: $X^2(\approx 1)$	25.82	0.126	0.0919	1.267	0.652	23.09	26.3
P-value	0.478	0.722	0.761	0.260	0.419	0.341	0.231

	LSt	LFGt	LFLt	LH_t	LLf_t	INF_t	PVt
β-co-efficient	0.275	-0.084	0.017	0.051	0.3238	0.005	-0.068
LR-test : $X^2(\approx 1)$	36.28	244.95	262.27	2.397	2.076	266.62	243.13
P-value	0.000**	0.000**	0.000**	0.3457	0.2748	0.000**	0.000**

DECLARATION

I, the undersigned, declare that this thesis is is my own original work and has not been presented in any other university. All sources of this matrials used for this thesis have been duly acknowledged.

Name : Toicssa Aboma

Signature: _____

Date : June 2001

Place : Addis Ababa.