

THE IMPACT OF FOREIGN AID ON GOVERNMENT FISCAL
BEHAVIOUR: *Evidence from Ethiopia*

A Mini-thesis to the Partial fulfillment of Masters in
Administration Submitted at the School of Government, University
of the Western Cape, South Africa



UNIVERSITY of the
By
WESTERN CAPE
Yonatan Minuye Dinku

Supervised by
Prof. Pieter le Roux

Cape Town

DECLARATION

Name: Yonatan Minuye Dinku

I hereby declare that the mini-thesis on topic: “THE IMPACT OF FOREIGN AID ON GOVERNMENT FISCAL BEHAVIOUR: *Evidence from Ethiopia*” is my own work that it has not been submitted before for any degree or exam in any other university , and that all the sources are used or quoted have been indicated and acknowledged as complete references.

Place: School of Government University of the Western Cape, Cape Town

Date: May 29, 2008

Signature:.....



ACKNOWLEDGMENTS

I would like to use this opportunity to express my deepest and sincere gratitude to Professor Pieter le Roux for his invaluable guidance, suggestions and comments while writing this thesis. My gratitude is also extended to ‘Deutscher Akademischer Austausch Dienst’ (DAAD) for funding my study.

I am also grateful to my fiancé Liya Mulugeta, and to my dear friends, Kefyalew Endale, Sharew Erkihun and Mihret Jember for their moral and material support in completing this thesis.



ACRONYMS AND ABBREVIATIONS

ADF	Augmented Dickey-Fuller
ARDM	Autoregressive Dynamic Model
CABRI	Collaborative African Budget Reform Initiative
DAC	Development Assistant Committee
GDP	Gross Domestic Product
HICs	High Income Countries
HIPC	Highly Indebted Poor Countries
IMF	International Monetary Fund
LDC	Least Developing Countries
LMIC	Lower Middle Income Countries
MDG	Millennium Development Goals
MOFED	Ministry of Finance and Economic Development
NL3SLS	Non-Linear Three Stage Least Square
OA	Official Aid
ODA	Official Development Assistance
OECD	Organization of Economic Co-operation and Development
UMICs	Upper Middle Income Countries
USD	United States Dollar
WDI	World Development Indicators

Table of Contents

Declaration.....	i
Acknowledgment.....	ii
Acronyms and abbreviations.....	iii
Table of contents.....	iv
List of tables and figures.....	vi
Abstract.....	1

Chapter One

1. Introduction	2
1.1 Background.....	2
1.2 Problem statement	3
1.3 Objectives of the Study	5
1.4 Justification and Significance of the Study.....	5
1.5 Organization of the Paper	6

Chapter Two

2. Literature Review.....	7
2.1 An Overview of the Concept of Foreign Aid	7
2.2 The Economics of Foreign Aid.....	8
2.2.1 The Supplemental versus Displacement View.....	8
2.2.2 The Theory of Fiscal Response and Fungibility of Aid.....	12
2.2.2.1 The Fungibility of Aid.....	13
2.2.2.2 The Theory of Fiscal Response.....	15
2.2.2.2.1 Fiscal Response Model – With Exogenous Aid.....	16
2.2.2.2.2 Fiscal Response Model – With Endogenous Aid.....	18
2.2.3 Empirical Findings on the Fiscal Response to Aid.....	23

Chapter Three

3. Country Background.....	30
3.1 Macroeconomic Overview of Ethiopia.....	30
3.2 How large is Aid to Ethiopia?.....	34
3.3 The Composition of Government Expenditure and Revenue.....	41
3.3.1 Government Expenditure.....	43
3.3.2 Government Revenue.....	45

Chapter Four

4. Data and Research Methodology.....	47
4.1 Data	47
4.2 Model Specification.....	48
4.3 Estimation Technique.....	51

Chapter Five

5. Estimation Results and Regression Analysis.....54
5.1 Measuring the Allocation of Aid Resource.....54
5.2 Direct Fiscal Impact of Aid Inflow.....57
5.3 Total Fiscal Impact of Aid Inflow.....59

Chapter Six

6. Conclusion and Recommendation.61
6.1 Conclusion.....61
6.2 Recommendation.....62
Reference.....64
Appendix.....68



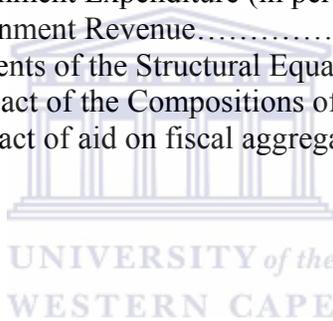
List of Figures and Tables

Figures

Figure 2.1: Categorical aid fungibility.....	14
Figure 3.1: Sectoral Value Added (Percentage contribution to GDP).....	31
Figure 3.2: Trend of Economic and population Growth in Ethiopia.....	32
Figure 3.3: Trend of Total Investment and Domestic Saving (as a percentage of GDP)..	34
Figure 3.4: Trend of ODA (in Millions of USD).....	36
Figure 3.5: Aid measured at per capita level.....	39
Figure 3.6: Measure of ODA as a percentage of some relevant- macro economic variables.....	41
Figure 3.7: composition of recurrent expenditure.....	44

Tables

Table 1. Composition of Government Expenditure (in percent).....	43
Table 2. Composition of Government Revenue.....	45
Table 3. Estimation of Coefficients of the Structural Equations.....	54
Table 4 Direct Incremental Impact of the Compositions of Government Revenue.....	57
Table 5. Estimates of total impact of aid on fiscal aggregates.....	59



Abstract

The effectiveness of foreign aid in bringing economic and social development is mired in controversy. However, despite the controversial debates on its effectiveness, poor countries of the world have been receiving and using aid as a leverage to relieve themselves from development constraints they faced. Ethiopia is no exception amongst developing countries. Since the time it joined the World Bank group in 1945, foreign capital inflow has remained an important source of revenue for the government. This paper examines the fiscal impact of aid inflow into Ethiopia using time series data for the period 1975-2005. The empirical findings reveal that inflow of foreign aid influences public decision on revenue and expenditure patterns. The result shows that a larger proportion of aid is allocated to capital expenditure and that only a small proportion goes to recurrent expenditure. There is a strong positive association between aid inflow and capital expenditure. The finding also shows that, while a very weak negative association exists between aid and taxation effort, aid and borrowing are used as alternative source of finance.

Key words: Foreign aid, fiscal behaviour, taxation effort, recurrent expenditure, capital expenditure, aid fungibility; borrowing, Ethiopia

CHAPTER ONE

INTRODUCTION

1.1 Background

The macroeconomic impact of foreign aid has been at the centre of the debates of aid effectiveness within academia and among economists since the time of the work of Chenery and Strout (1966).¹ Despite controversial debates on its effectiveness,² foreign aid is considered as an important source of development resources to poor countries. As a result, poor countries of the world have been using aid as a leverage to relieve themselves from development constraints they faced.

Given the macroeconomic impact of foreign aid on recipient countries, identifying the factors on which aid effectiveness is conditional has attracted the attention of many development economists. Thus, apart from the basic theoretical debates on the saving and foreign exchange gaps, economists have identified other determinant factors of aid effectiveness. For example, Reddy and Minoiu (2006) argue that the effectiveness of foreign aid in bringing considerable socio-economic development depends on whether aid is given in the form of multilateral or bilateral aid. They have noted that, while aid from multilateral organizations goes to developmental investments, large part of bilateral aid goes to consumption expenditure by recipient governments.³

¹ Using the two-gap model (the saving and foreign exchange gap) it was Chenery and Strout who suggested that aid has a development effect in poor countries by helping them to fill their resource gaps.

² The macroeconomic impact of foreign aid has remained controversial both theoretically and empirically. Theoretically, while some argue that aid supplements domestic saving and ease investible resource constraint of poor countries by filling saving and foreign exchange gaps, others argue that aid has a crowding out effect on domestic saving and private investment; hence it stimulates the consumption of the political elites. Empirically, some studies found statistically significant positive correlation between aid and macroeconomic variables such as saving and growth. Others found, on the contrary, results that indicate a crowding-out effect of aid and thus challenge pro-aid arguments. On the other hand, some regression results suggest that, regardless of the direction of correlation, correlation coefficients between aid and saving are insignificantly different from zero; implying that foreign aid doesn't impact on domestic saving.

³ The literature argues that multilateral organizations are less biased towards specific political and economic interests compared to bilateral donors. Bilateral donors mostly attached conditionality to aid that are both politically and economically rewarding to their nations; and they are biased towards governments that conform to their foreign policies, political allies (Alesina and Dollar, 2003). This will trigger the problem of consumption of aid by recipient governments.

Similarly, an oft-repeated view has been that loans are used more efficiently than grants because they are expected to be repaid. Furthermore, the need for repayment motivates governments to select projects or programs whose benefits exceed costs (Djankov *et al.*, 2005). This issue has reemerged with calls for a shift from loans to grants. However, in the view of some observers, excessive lending has led to massive debt accumulation in many developing countries while failing to reach intended development objectives.⁴

On the other hand, studies such as, Boone (1996), Burnside and Dollar (2000), Dalgaard *et al.* (2004) and Collier and Dehin (2001) respectively argue that aid positively affects growth only in countries where there is good political and institutional environment; in countries with good macroeconomic policy; in countries outside the tropics; and in countries experiencing negative export price shocks.

It is evident that there are large numbers of studies on aid effectiveness. However, one of the shortcomings of these studies is that they overlook the fact that aid is given primarily to the government, and therefore, any macroeconomic impact will depend on public sector fiscal behavior (McGillivray and Morrissey, 2001). Another strand of the aid effectiveness literature, therefore, has attempted to look at how the inflow of foreign aid affects the fiscal behavior of recipient governments.

1.2 Problem Statement

The fiscal impact of aid has become one of the most important issues related to aid effectiveness. Opponents of foreign aid argue that foreign aid has enlarged the size of the government, which crowds out the private sector. It is also argued that aid makes recipient governments relaxed to raise their own revenue so that develop aid dependency, which has a long term repercussion on the capacity of the government to collect tax (Heller, 1975; McGillivray and Morrissey; 2001).

⁴ In this regard, many poor countries, especially Sub-Sahara African countries, are identified as Highly Indebted Poor Countries (HIPC) since 2001, Ethiopia is among those countries. Those countries are given a chance for debt cancellation, because they can not pay it back.

Like many developing countries in the world, foreign aid is an important source of finance in Ethiopia.⁵ Since the time it joined the World Bank group (in 1945) and the opening of international aid market in the early 1950s, millions of dollars have been flowing in to the country. For example, Measured as a proportion of GDP, aid increased from an annual average of 6.3 percent in the late 1970s and 1980s to 12.9 percent in the 1990s .The percentage had increased substantially in 2000 to 2003 with annual inflow of 17, 21.6 and 23 percent of GDP respectively. Similarly, despite the low level of aid that Ethiopia receives at per capita level, foreign aid can be considered as an important component of the government revenue. Aid as a proportion of total government revenue had increased from 11.8 percent in the late 1970s and 1980s to 15 percent in the 1990s, and 22.8 percent in the period 2000-2003.⁶

Moreover, aid as a percentage of other fiscal variables such as total government expenditure and its components increased from decade to decade. For example, the annual average inflow of ODA measured against total government expenditure had increased from 9 percent in the late 1975 and 1980s to 11.8 percent in the 1990s and 16.8 percent in 2000-2003. Similar increase had been registered with regards to ODA as a percentage of government consumption and government investment. ODA as a percentage of government investment had increased from annual average of 34 percent in the late 1975 and 1980s to 36.6 percent in the 1990s, and to 49 percent from 2000 -2003. The highest percentage of ODA as percentage of government investment was registered in 2003, about 65 percent. Like wise, the annual average inflow of ODA as a percentage of government consumption expenditure had increased to more than double, from 12 percent before 1990 to 26 percent in the period 2000 to 2003.⁷

As argued by the fiscal response literature, the effectiveness of foreign aid is influenced by public fiscal behavior; hence the allocation of aid in the budget process will determine

⁵ However, Ethiopia receives much less amount of aid at per capita level for decades than most poor countries in the developing world. For example, it received USD 15 in 2004, while the average for poor countries was USD 23 in the same year (World Bank, 2004:73).

⁶ Calculated based on a data from World Development Index(WDI, various years; WORLD BANK CD-ROM)

⁷ Computed based on a data from Ministry of Finance and Economic Development(MOFED, various years)

its contribution to growth and development in Ethiopia. Thus, understanding how aid is an important source of revenue to the government, the researcher is interested to undertake an empirical research to elucidate how foreign aid affects the government's fiscal behavior; i.e. tax revenue effort and its decision on public spending. Thus, the guiding questions containing the research problem are:

- i. Does foreign aid negatively affect domestic saving and undermine the government's incentive to raise tax-revenue?
- ii. Is foreign aid fungible in Ethiopia? Does it, instead of supporting development activities, finance government consumption expenditure?
- iii. Does inflow of foreign aid displace budget financing through borrowing?

1.3 Objectives of the Study

The above research questions are designed to address how the Ethiopian government reacts, fiscally, to aid in the form of Official Development Assistance (ODA) as a general objective given the following specific objectives. Thus, the paper aims to:

- i. Present the composition of revenue and expenditure of the government;
- ii. Examine the trend and patterns of foreign aid in Ethiopia.
- iii. Critically analyze the effect of foreign aid on taxation effort and public spending and domestic borrowing in Ethiopia ;
- iv. Summarize the main findings of the research and provide relevant policy recommendations.

1.4 Justification and Significance of the Study

Empirical assessments of the macroeconomic impact of foreign aid and fiscal response to aid have been dominated by cross-country estimation since the genesis of empirical investigation on the field. Results obtained from such studies have been used for across-the-board policy recommendations. However, although cross-country assessments are vital in identifying the determinant factors of aid effectiveness, explaining aid effectiveness by aggregating large number of developing countries will overlook some

country specific factors⁸. This methodology also pays no heed to individual countries' successes or failures (Hansen & Trap, 2000b).

It is against the background of this shortcoming that this research focuses on a single country case study. More broadly, this thesis can be viewed as an attempt to demonstrate that overlooking the specific effects associated with individual aid recipient countries may lead to aggregation bias in the results and consequently misleading policy recommendations. Thus, the results obtained from the research could give relevant information to the government to make adjustments in the use and allocation of aid resources. Thus, the study could provide a useful insight into the policy formulation regarding aid and into the poverty reduction strategy that could help Ethiopia in its battle to reduce poverty. The research could also be used by donors to identify whether aid is fungible or used for the intended development activities, and take appropriate measures when necessary. Moreover, the research finding could be an informative and lays the foundation for future research on the importance and fiscal impact of foreign aid.

1.5 Organization of the Paper

After this introductory chapter, the other chapters are as follows. Chapter two contains the literature review. It provides an overview of the concept of foreign aid, of the theoretical debates on the economics of foreign aid, and a review of some empirical findings on the fiscal impact of aid. Chapter three discusses Ethiopia's macro economy, the trend and patterns of foreign aid in the country; and the composition of government expenditure and revenue. Chapter four looks at the type of data available and the methodology used in this dissertation. Chapter five contains the analysis and interpretation of the empirical finding with respect to Ethiopia. Finally, chapter six gives the general conclusion and makes some relevant recommendations.

⁸ What is common among developing countries is that, they are recipients of aid in one way or another; otherwise they all have different socio-economic structure, different institutional capacity, political and environmental conditions and other country specific determinant factors.

CHAPTER TWO

LITERATURE REVIEW

2.1 An Overview of the Concept of Foreign Aid

Aid can be termed foreign aid, international aid or overseas aid. However, it is an ambiguous word and there is no common agreement on its definition and its measurement (Healey, 1971). Different organizations include or exclude a variety of items in defining the term: some consider aid as any transfer of resources including military assistance or trade financing from one country to another; for others aid refers only to humanitarian relief for victims of disasters.⁹ Furthermore, some define aid also as capital lent to needy countries with very low interest rates and long repayment period.¹⁰

Despite the existence of different definitions and attributions of foreign aid, this paper considers a pragmatic definition of aid ascribed to its developmental significance. Thus, one suggestion to reduce the above heterogeneity to a common measure is to accept the official definition of aid by the Development Assistance Committee (DAC) of the Organization of Economic Cooperation and Development (OECD).¹¹ According to the DAC's definition, foreign aid consists of grants or loans that one government or multilateral organization gives to a recipient country. But the specific nature of aid depends on to which country the aid is given. Thus, two groups of aid recipient countries have been identified by DAC. Members on their list I are grouped into least developed countries (LDCs), low middle income countries (LMICs), upper middle income countries (UMICs) and high income countries (HICs). This group includes most countries in Africa, Asia and Latin America. Their List II consists of countries that are in transition or reasonably advanced in the development process; countries grouped under this category are former socialist Eastern Europe countries. According to DAC's classification, aid given to members of list I is called Official Development Assistance (ODA); and aid that

⁹ www.iie.com/publications/chapters_preview/321/1ie2911.pdf

¹⁰ www.academicdb.com/_is_true_definition_foreign_aid_18776/

¹¹ DAC is a forum for its member states in their role as bilateral donors; it has 23 member countries; it is the depot of Organization for Economic Co-operation and Development (OECD's) official information on international aid; monitoring financial flows and their allocation in all aid recipient countries an important aspect of DAC. See at, www.oecd.org/department/0,2688,en_2649_34447_1_1_1_1_1,00.html

goes to members of list II is Official Aid (OA). Aid has to meet three requirements in order to be considered as Official Development Assistance (ODA):¹² (i) it is undertaken by the official sector; (ii) the main objective is promotion of economic development and welfare; and (iii) it is provided on the concessional financial terms (if a loan has a grant element of at least 25 percent).

Therefore, since this paper focuses on aid given to the least developed countries (LDCs), particularly to Ethiopia, Official Development Assistance will be treated synonymously to foreign aid throughout the paper.

2.2 The Economics of Foreign Aid

2.2.1 The Supplemental versus the Displacement View

This strand of the literature discusses the very idea whether aid is important or not for lifting up poor economies and put them on a development path. In the debates of development co-operation, some argue that aid can assist poor countries to accelerate their economic growth by providing skills and finance for investments in public goods that the international capital market does not supply, or if it does, at a higher interest rate (Chenery and Strout, 1966). However, others oppose this view by pointing out cases where aid can bring more harm than good to such poor economies. According to this argument, aid has no positive effect on growth; rather it may actually undermine growth performance (Griffin, 1970). In the Supplemental and the Displacement Views, the theoretical explanation of the macroeconomic impact of foreign aid is deep rooted in the capital accumulation role of foreign aid, the aid-saving relationship.

In a conventional version of the supplemental view, foreign aid is considered as supplemental to domestic saving. It is argued that, since poor countries produce less goods and services and consume a substantial proportion of their meager income, the marginal propensity to save is less. Hence, investible resources are less than what is

¹² <http://stats.oecd.org/glossary/detail.asp?ID=1891>

required to bring about economic growth. Thus, the theory suggests that, foreign aid can assist poor countries to relieve themselves from such investment bottlenecks by providing the necessary investible resource. It is assumed by pro-aid development economists such as Rosenstein (1961), Rostow (1963) and Chenery and Strout (1966) that each dollar of foreign resources in the form of aid would result in one dollar increase of savings and investment. They all have used the Harrod-Domar model as a theoretical workhorse to explain how foreign aid supplements domestic resources in recipient countries.

For example, Rosenstein (1961) specifies that the purpose of aid to under developed countries is to accelerate their economic development up to a point where a satisfactory rate of growth can be achieved on a self sustaining basis. According to Rosenstein, the amount of foreign aid that raise total saving is determined by the marginal saving rate being higher than the average saving rate; and this differential should be a specific condition to justify capital aid. Rosenstein equally emphasized that aid should not be given only until a certain income level is reached; rather it should continue until recipients can mobilize a level of capital formation sufficient for self sustaining growth.¹³

Furthermore, in his theory of the stages of economic growth,¹⁴ Rostow argued that ‘take-off to self sustaining’ is the most important stage in the process of economic growth, where economic and social conditions for sustainable growth are created. For the take-off to occur, according to Rostow, the most important input is a significant increase in the rate of net investment in the economy. However, Rostow argues that, poor countries do not have the capacity to mobilize resources to raise the investment rate to reach the stage of take-off to sustained growth, hence they need foreign aid. Using the Harrod-Domar paradigm, Rostow suggested that injection of aid in to economy of a poor country augments domestic saving; hence the rate of investment can be raised.

¹³ This is consistent with the argument in his writings of the ‘big-push’. Rosenstein has drawn a parallel between conditions for spurring growth in an underdeveloped economy and those required by an airplane that needs to take off from a runway. He suggested that, like an airplane has to gain a certain velocity before take off, an economy has to gain momentum which can be achieved by large scale investment in order to start growing successfully.

¹⁴ Rostow formulated five stages of economic growth: The traditional society, the precondition to take off stage, the stage of take off to self sustaining growth, the stage of a drive to maturity, and lastly the stage of mass consumption.

Following the theoretical argument of Rostow and Rosenstein, Chenery and Strout (1966) also gave a detailed explanation on how foreign aid can affect the macroeconomic conditions of poor countries. Picking up on the Harrod-Domar Model, the authors developed a two-gap model.¹⁵ Their model is built based on the assumption that recipient countries are will not divert foreign aid to consumption, so that investment would grow correspondingly. This implies that their model assumes that recipient countries do not react to foreign aid inflow by reducing saving and increasing consumption.

In general, in the supplemental view, foreign aid is considered as a net increment to domestic saving of recipient countries, hence investment would increase with the same proportion to aid inflow. In the world of Rosenstein, Rostow, Chenery and Strout, therefore, aid is not considered as a component of national income adding to both consumption and investment. To them, fungibility of aid resources is not a problem.

Despite the strong theoretical debate by pro-aid conventional theorists, empirical evidence on the positive relationship between national savings and external capital inflow has been scarce and inconsistent. Closes on the heels of Chenery and Strout (1966), Rahman (1968) and Griffin and Enos (1970), as well as others, have probed into the relationship between aid and domestic saving using different cross-country assessments. Statistical evidence emerging from these studies show that domestic savings is inversely related with foreign aid. In a an empirical assessment of the impact of foreign capital inflow on domestic saving, Griffin and Enos found that each dollar of additional aid to 32 developing countries crowds out 75cents and adds only 25 cents to investment(Griffin & Enos,1970:321). Thus, by criticizing the assumptions of the supplemental view, Griffin and Enos (1970) argue that most governments will either divert the aid to consumption or substitute it for the resource which would have been invested in the absence of foreign

¹⁵ In the two-gap model, one has a saving-investment gap and, secondly, a trade gap, also called foreign exchange gap. A savings gap is said to occur when domestic saving is less than planned investment; whereas a foreign exchange constraint occurs when the foreign currency reserve of a country is insufficient to finance its imports (Chenery and Strout, 1966). They noted that, since poor countries have lower savings rates and their export is frustrated both by internal and external factors, they are likely to be exposed to these gaps. Thus, according to the authors, foreign aid can assist poor countries in raising the level of investible resources by augmenting domestic saving and raising the amount of foreign-currency that is needed to finance imports of capital.

aid. Based on their empirical result, they have noted that aid retards development by leading to lower domestic savings.

In a similar fashion, Rahman undertook a regression between aid and domestic saving on the data of 31 developing countries and found that an increase of foreign capital inflow on one dollar crowds out 25 cents of domestic saving (Rahman, 1968:426). Similarly, a regression result by Weisskopf (1972) covering 44 developing countries suggests that the impact of foreign capital inflow on domestic saving in the countries surveyed is significant and negative. Gupta (1975) also used a cross-country assessment using cross-section data for 40 developing countries. After introducing per capita income as a control variable, the saving-aid regression result shows that foreign aid and domestic saving are strongly negatively correlated, implying that aid substitutes saving in these countries.

In addition to its saving displacement effect, some argue that aid has also other negative fiscal effects in recipient countries. The argument is that governments would relax attempts to raise their own revenue, especially tax revenue, when they are sure of getting foreign assistance. Griffin (1970) argues that aid eases the pressure on recipient countries so that governments feel less of a need to make an effort of their own. On the other hand, aid flows can also enlarge the size of the government by increasing the ability to raise its total expenditure in the economy (Remmer, 2004). According to Remmer, this would frustrate the emergence of an indigenous entrepreneurial class; aid thus crowds out private investment.

Similarly Bauer (1971) and Friedman (1958) have argued that poverty is the result of a harmful political regime that introduces distortional policies for the benefit of narrow political elite. And, according to them, foreign aid would sustain governments in their pursuit of economically counterproductive policies. When the pursuit of such policies worsens the economic performance of an aid recipient, Bauer and Friedman noted that, the country may qualify for still more aid because its situation is deteriorating. Therefore, Bauer (1971) has strongly argued that, aid, far from being necessary to rescue poor societies from a vicious circle of poverty, is far more likely to keep them in that state.

In sum, according to the supplemental view, foreign aid is perceived as an exogenous net increment to the capital stock of the recipient country. Thus, the role of foreign assistance is to ease the saving constraints by providing investible resources to supplement domestic efforts. On the other hand, the displacement view suggests that foreign aid displaces domestic saving and investment by financing government consumption. The implication of the displacement view is that aid necessarily leads to a direct fall in domestic saving level, so setting in motion a vicious rather than a virtuous circle; a decline in saving rate causes a decline in investment, hence leading to a lower growth rate. Accordingly, empirical findings are found to be inconsistent and fragile. Some studies concluded that foreign aid, because of its negative saving effect, undermines growth. However, others have refuted such findings and found a strong and positive relationship between aid and growth.

2.2.2 The Theory of Fiscal Response and Fungibility of Aid

An important complicating factor, which has not been explicitly accounted for in the gap literature, is the fiscal behavior of aid recipient governments. According to McGillivray and Morrissey (2001), the deficiency of the aid-growth literature is that it fails to explicitly recognize that aid is given primarily to the government, and hence any impact of aid on the economy will be mediated by government behavior. As noted by the displacement theory, foreign aid has a significant effect on the fiscal behavior of aid recipient governments. It is, in particular, of considerable interest to understand how aid inflows affect government expenditure and financing patterns. Thus, following the argument by the radical literature of displacement theorists, two distinct but inter-related strands of the literature have attempted to deal with these issues, both having the concept of aid fungibility as a central issue.

The first approach is explicitly concerned with the fungibility of aid with regards to government spending patterns. Studies of fungibility are concerned with identifying whether aid that is intended by donors to be spent on a particular expenditure item, such as health or education, is in fact allocated to that area or not. This is often referred to as

categorical fungibility, as the issue is the allocation of aid to other expenditure categories. The other literature, called ‘fiscal response’ literature, adopts a more theoretical approach and attempts to analyze how aid affects various categories of expenditures and financing sources. The fiscal response literature explicitly models the impact of aid and how it is mediated by public sector behavior.

2.2.2.1 The Fungibility of Aid

Following the revisionist view,¹⁶ the problem of fungibility of foreign aid has attracted the attention of many development researchers (Heller, 1975; Pack and Pack, 1990 & 1993; White, 1998; Devaranja and Swaroop, 1998; Feyzioglu *et al.* 1998 etc).¹⁷ The term fungibility is used to describe the degree to which resources ostensibly allocated for one purpose may in effect free up resources for other purposes. For instance, donor willingness to fund projects in certain sectors may allow governments in times of fiscal stringency to sustain funding in other sectors that are considered politically sensitive and unattractive to donors (Wilkes, 2001). More importantly, White (1998) elaborates the definition for fungibility by distinguishing between aggregate and categorical fungibility. According to White, the former occurs when the aggregate category (say, government capital expenditure) does not rise in a one-for-one manner with an aid flow whose intended purpose is to increase that aggregate. On the other hand, categorical fungibility occurs if the inflow increases any expenditure item within the aggregate other than those intended by the donor (White, 1998:92).

Due to the problem of aid fungibility, the link between aid and the recipient’s budgetary allocation is not straightforward (Devaranja and Swaroop, 1998). For example, if a

¹⁶ Griffin(1970) and Griffin and Enos(1970), by looking at the relationship between aid and domestic saving , attacked the optimistic view of aid proponents such as Rosenstein(1961) and Rostow(1963) and Chenery and Strout(1966) by analyzing the way aid may be used fungibly for unintended purposes.

¹⁷ According to the view of displacement theory and most of these studies, aid is said to fungible at aggregate level if

$$\frac{\Delta I_g}{\Delta A} < 1; \frac{\Delta G_c}{\Delta A} > 0 \text{ and } \frac{\Delta T}{\Delta A} < 0 . \text{Where } I_g \text{ is government investment expenditure; } G_c \text{ is government consumption}$$

expenditure; T is tax revenue; and A is foreign aid.

government would have undertaken a donor-financed project in the absence of that financing, then it could be possible to say that donor funds simply relaxed the government's budget constraint to finance something else.

This can be illustrated graphically as follows.

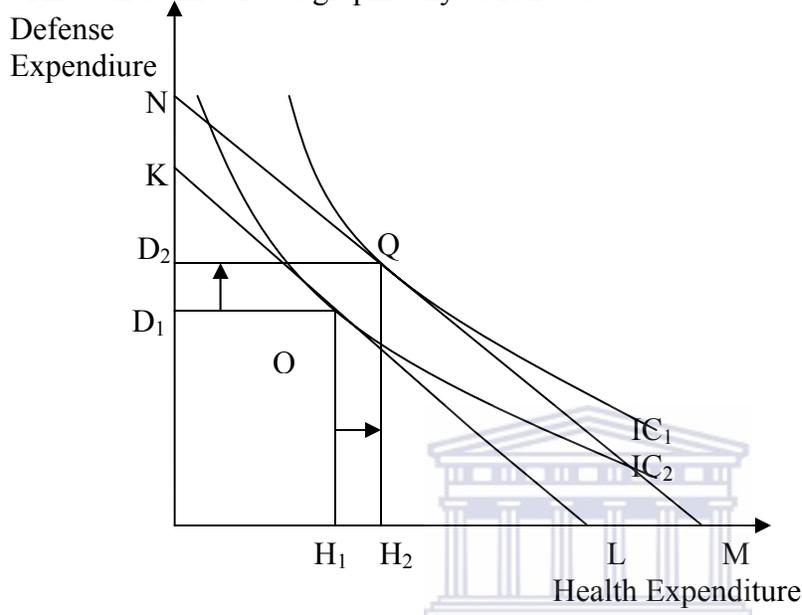


Figure 2.1. Categorical aid fungibility

Source: The author's own graph based on the analysis by Devaranjan and Swaroop (1998:79)

Suppose, the recipient government has preferences for spending its budget on military and the health sector, with indifference curves as shown in figure 1. In the absence of foreign aid, the government's budget constraint is KL; and assuming standard preferences, the consumption bundle is at point O, with expenditure on Health equaling $L-H_1$. Now, suppose a donor gives a quantity of aid, equal to LM, intended for health projects. This shifts the budget constraint out to MN. As discussed by supplemental aid theory, there is no fungibility in the two-gap models. Thus, it is assumed that aid is used to increase investment on health only, whilst expenditure on defense at period t remains unchanged at point O; i.e. expenditure on aid increases by the amount equivalent to the level of aid inflow (Chenery and Strout, 1966).

In contrast, and as done by Griffin (1970), White (1992) argued that aid will in reality be treated like any other income and shared between consumption and saving according to their respective marginal propensities. Fungibility studies, therefore, are interested in identifying by what amount health expenditure will rise. According to the fungibility literature, donation to the health sector will move both defense and health sector expenditure to Q and health sector investment will be less than LM, the intended amount of expenditure by the donor. This implies, according to the fungibility literature, that part of the aid intended for health sector financing will be diverted to finance the military sector.

As shown in the figure, even if the donor can ensure that the specific funds given reach their intended destination, the net change in health spending will be less than the amount of aid. As a result, there is no one-to-one relationship between aid and expenditure on health; making aid fungible. This is because aid simply pushes out the budget constraint of the recipient, who resolves its utility maximization problem and chooses a budget bundle such as point Q. In addition, according to the literature on fungibility, even if all the aid money goes to the health sector, some money previously allocated to the sector will be (in this case) shifted to military expenditure.

2.2.2.2 The Theory of Fiscal Response

The Fiscal response literature has examined the change in the fiscal behavior of aid recipient governments for every unit of aid flowing officially in to the country. Although it mainly focuses on assessing the impact of foreign aid on the revenue and expenditure pattern of the public sector, it also deals with fungibility problems in the budget process.

Similar to the analysis of consumer behavior in microeconomics, the literature on fiscal response assumes that public sector decision-makers tried to maximize utility from various types of expenditures subject to a budget constraint. In the literature, the two most important components of public expenditures are recurrent expenditure and capital expenditure (also called government investment). However, further decomposition of these expenditures is used in some earlier studies such as Heller (1975) and Mosley *et al.*

(1987).¹⁸ In much of the fiscal response literature, it is assumed that public officials are faced with the task of allocating resources among the two types of expenditure subject to assumed budget constraints. In the literature, public decision-makers are further assumed to behave as if they were a single individual with a well-behaved, homothetic preference map and utility function, like in (1) below.

$$U = F(I_g, C_g, T, B, A) \dots\dots\dots 1$$

Where I_g represents public investment, also called capital expenditure; C_g consumption in the public Sector called recurrent expenditure; B is the flow of public borrowing from both domestic and foreign sources; and A is foreign aid (Heller, 1975: 437; Mosley *et al.*, 1987:628).

The fiscal response literature relies on more formal modeling in order to identify how aid inflows may result in changing government fiscal behavior that could undermine or promote the intended growth effects of aid (McGillivray and Morrissey, 1999). A number of studies on this subject has appeared following the seminal paper by Heller (1975), such as Mosley *et al.* (1987), Gang and Khan (1991), Binh and McGillivray (1993). In the fiscal response literature, it is argued that governments try to maximize the utility function by attaining some target levels both for expenditures and revenues. Thus, the standard point of departure with regard to a government utility function is to set a target value for aid inflow. In earlier works, such as Heller (1975) and Mosley *et al.* (1987), aid inflows have traditionally been included in the utility function as an exogenous variable (on the ground that aid levels are supply determined). However, Franco-Rodriguez *et al.* (1998) modified the original utility function of Heller (1975) by including aid as an endogenous variable.

2.2.2.2.1 Fiscal Response Model – With Exogenous Aid

The first theoretical model in the literature of fiscal response to foreign aid is the one developed by Peter Heller in 1975, and latter adopted by Mosley *et al.*(1987), Gang and Khan (1991) and others. The model focuses on the interactions among several categories

¹⁸While Heller (1975) decomposes recurrent expenditure in to civil and social consumption, Mosley *et al.* (1987) further divided current expenditure in to developmental and non developmental.

of public expenditure and revenue. Heller built the model on the assumption that public sector decision makers try to maximize their utility taking into account, (i) alternative uses of public resources such as expenditures for economic growth, for provision of current social and economic services, and for the maintenance of political order and stability; (ii) the distribution of total output between the private and public sector; (iii) alternative modes of domestic financing such as borrowing and taxation; and (iv) alternative types of external assistance, such as grants and loans. Accordingly, the fiscal response model developed by Heller (1975) considers a utility function similar to (1) above.

In the fiscal response model by Heller (1975: 429-445) and Mosley *et al.* (1987:616-641), policymakers are assumed to act rationally to maximize their utility by setting and attaining targets for expenditures, tax and non-tax revenue and borrowing, not for aid. Accordingly, the utility function in (1) can be written in the form of quadratic loss function as;

$$U = \alpha_0 - \frac{\alpha_1}{2} (I_g - I_g^*)^2 - \frac{\alpha_2}{2} (C_g - C_g^*)^2 - \frac{\alpha_3}{2} (B - B^*)^2 - \frac{\alpha_4}{2} (T - T^*)^2 \dots\dots\dots 2$$

Where the asterisks denote exogenous target levels of the endogenous variables and $\alpha_i > 0$ for $i = 1 \dots 4$. It is clear from (2) that government maximizes its utility if it achieves all targets, the maximum unconstrained value being α_0 . Also, as $\alpha_i > 0$ the principle of diminishing marginal utility is ensured for all levels of I_g , G , T and B . What the government now wants to do is maximizing U subject to the budget constraint that expenditures cannot exceed the sum of all revenues. The fiscal response model by Heller (19975) considers tax revenue as endogenous and foreign aid as exogenous to the public sector.¹⁹ Moreover, the model assumes that aid cannot be used directly for public consumption expenditure, at least *ex ante*, and no relaxation of borrowing effort by the

¹⁹According to Heller (1975), increases in the tax burden T become increasingly difficult for the public decision maker to espouse, both because of the increased administrative difficulty of collection, and because of the economic cost and political resistance engendered in countries at low income levels. Of primary importance is the assumption that the choice of tax rate is a policy instrument available to public decision makers, so that T is endogenous. On the other hand, the model assumes that aid recipient governments are not in a position to increase significantly the level of capital inflows beyond that actually offered. Therefore, capital inflows to the public sector from abroad, whether public or private, bilateral or multilateral, grants or loans, are assumed to be exogenous to the public sector.

government. As a result, foreign aid is believed to finance government investment. In the theoretical model of Heller (1975), unlike borrowing and tax revenue, foreign aid is treated as an exogenous policy variable and excluded from the loss function (2). Therefore, Heller’s theoretical model considers the following constraints (Heller,1975: 439).

$$I_g = B + (1 - \rho_1)T + (1 - \rho_2)A \dots\dots\dots 3$$

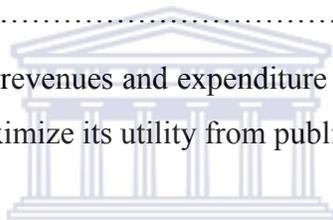
$$C_g = \rho_1 T + \rho_2 A \dots\dots\dots 4$$

Where ρ_1 and ρ_2 are between 0 and 1, and ρ_2 is a measure of the proportion of aid that goes to government consumption. In other words, it a measure of aid fungibility, assuming that aid is only given for development purposes.

The sum of (3) and (4) gives;

$$I_g + C_g = B + T + A \dots\dots\dots 5$$

Equation (5) shows that all the revenues and expenditure components should be balanced so that the government can maximize its utility from public spending.



2.2.2.2.2 Fiscal Response Model – With Endogenous Aid

Franco-Rodriguez *et al.* (1998) modified the Heller (1975) type model in to a distinctive feature of fiscal response model by endogenizing the aid component of the utility function.²⁰ Franco-Rodriguez *et al.* (1998) noted that aid disbursement is influenced by recipients and, therefore, it should be considered as a government policy variable. As a result, foreign aid has been included in the utility function, and equation (2) is modified as;

$$U = \alpha_0 - \frac{\alpha_1}{2} (I_g - I_g^*)^2 - \frac{\alpha_2}{2} (C_g - C_g^*)^2 - \frac{\alpha_3}{2} (B - B^*)^2 - \frac{\alpha_4}{2} (T - T^*)^2 - \frac{\alpha_5}{2} (A - A^*)^2 \dots\dots 6$$

Where A represents actual disbursements and the target A^* can be represent commitment by donors.

²⁰ According to Franco-Rodriguez *et al.* (1998), governments have a target for aid revenue, and this expected revenue is incorporated into their fiscal planning. In other words, when determining revenue and expenditure allocations, governments take aid revenue in to account.

The modified utility function is acknowledged and has been used by several studies, such as Swaroop *et al.* (2000), McGillivray (2002), McGillivray and Ouattara (2003), Njeru (2003) and Camara (2004). The studies have used the model as a theoretical background for their study on fiscal behavior of the public sector in different aid recipient countries. Accordingly, Picking-up on the aid-endogenised model of Franco-Rodriguez *et al.* (1998), McGillivray and Morrissey (2001) attacked the theoretical model of Heller (1975) on two grounds. The first is regarding the interpretation given to ρ_2 in (3 and 4) above, which is taken to represent the extent of fungibility of aid in much of the fiscal response literature. In Heller's (1975) theoretical model it is implicitly assumed that donors grant aid for investment purposes only (and that all investment expenditures are captured in I_g). Hence, any aid allocated to G is an *ex post* measure of fungibility (i.e. $\rho = 0$ *ex ante*). However, McGillivray and Morrissey argue that, since there are elements of G which donors would be willing to support, $\rho_2 > 0$ *ex ante*; and the estimated value of ρ_2 is a measure of maximum fungibility (McGillivray and Morrissey, 2001:48).

The second problem mentioned by the authors is that (3 and 4) over-constrains the model, i.e. not necessarily allowing the government to reach α_0 , even in the case where revenues are sufficient to meet all targets. According to them, although total revenue may be sufficient to meet total expenditure (5), the α s constrains allocation so that specific expenditure targets in (2) cannot be met. McGillivray and Morrissey have suggested, thus, a single constraint like (5), which will always ensure that the model can attain α_0 when revenues are sufficient to meet each target.

Moreover, McGillivray and Ouattara (2003) argue that donors commit a certain amount of aid to recipients each year, and it is ultimately up to recipients to determine how much of that commitment is disbursed (actually spent) in the year. Recipients do have a large degree of choice over the amount disbursed, and hence allocate among expenditure categories. Consequently, it is appropriate to treat disbursed aid as an endogenous variable.²¹ Given this reasoning, McGillivray and Ouattara further suggested that:

²¹ However, the authors acknowledged, since the level of aid is determined by donors purely on the basis of supply-side criteria, the theoretical treatment of aid as exogenous from the perspective of recipients.

Under-spending an aid commitment in any given year is undesirable as it implies an inability to utilize all aid (limited absorptive capacity) and may result in decreased commitments in subsequent years. Overspending is also undesirable as, in practice, if disbursements exceed commitments it means either delayed spending of past commitments (suggesting limited absorptive capacity) or, more often, that emergency aid was granted during the year (thus, it is a proxy for an adverse shock, such as famine)(McGillivray and Ouattara,2003: 72).

Based on this, it is then assumed that the government maximizes utility function (6) subject to (5) and (7):

$$C_g \leq \rho_1 T + \rho_2 A + \rho_3 B \dots\dots\dots 7$$

Where T represents tax , B is both domestic and foreign borrowing, and A is foreign aid; and ρ_1 , ρ_2 , and ρ_3 are the proportion of taxes, foreign aid and borrowing allocated to government consumption, respectively.

Consequently, given that the model contains two categories of expenditures, recurrent and capital expenditures $(1 - \rho_1)$, $(1 - \rho_2)$ and $(1 - \rho_3)$ are the proportions of tax, aid and borrowing, respectively, directed towards public investment. McGillivray (2000) suggests that the rationale for the inequality written in (7) is that there are external constraints that limit the manner in which the public sector in developing countries allocates revenues. The actions of donors or domestic interests cause the values of the ρ s in (7) to be imposed on those involved in setting targets and allocating revenue, with there being no guarantee that targets can be met even though revenues may satisfy (5). In other words, as in Franco-Rodriguez *et al.* (1998) argued, on the assumption that (7) is binding (the possible value of C_g is upper bound), these external constraints prevent the attainment of α_o . This is because, according to Franco-Rodriguez *et al.* (1998), one or more expenditure targets cannot be met even if total revenue equals total expenditure. On the other hand, McGillivray and Morrissey (2001) suggest that if (7) is not binding, utility is maximized subject to only (5) and the government can attain α_0 .

So far, the fiscal response models showed how public decision makers adjust and maximize their expenditure in response to aid inflows. However, similar to expenditure responses, the fiscal response literature has also tried to explain how revenue effort of aid recipient governments is affected by aid inflow. The literature shows that taxes could either increase or decrease in response to aid inflows. The first model developed in this area tends to conclude that the increase in government spending is likely to be smaller than the increase in aid. Thus, assuming domestic borrowing does not decline, aid can lead to a reduced tax effort (Heller, 1975). On the other hand, some part of the literature points out the theoretical scenarios under which this assumption might not hold. For example, White (1994) finds that whether or not aid adversely affects tax revenues depends, *inter alia*, on the impact of aid on private investment.²²

Analogous to the utility function based model of Heller (1975) and Franco-Rodriguez *et al.* (1998), Gupta *et al.* (2003) have developed a theoretical framework to analyze a possible effect of foreign aid on tax revenue. By assuming total government expenditure in stead of the decomposed expenditures,²³ Gupta *et al.* (2003) consider equation (5) as the only budget constraint. Accordingly, differentiating equation (5) with respect to A yields;

$$\frac{\partial G}{\partial A} = \frac{\partial T}{\partial A} + \frac{\partial A}{\partial A} + \frac{\partial B}{\partial A} \dots\dots\dots 8$$

To give the theoretical explanation for the impact of aid on tax revenue effort, Gupta *et al.*(2003) assumes that aid comes in the form of budget support. This is because, according to the authors, if aid is tied to projects, it would require generation of counterpart funds for implementation of projects.²⁴ Based on the assumption, the authors suggest three different scenario under which the government could respond to an

²² According to White (1994), in some countries, the dampening effect of aid on revenues could be part of a strategy to return resources to the private sector to accelerate economic growth. In these cases, it would be important that the reduction in the tax burden is realized through measures that improve the efficiency of the tax system (e.g., through a reduction in tax rates), rather than reduced efforts to ensure tax compliance.

²³ In the fiscal response literature, $G=I_g+G_c$; where G is total expenditure.

²⁴ In that case, $\partial T/A \partial >-1$

exogenous flow of aid. These are: (i) reducing tax effort, (ii) increasing total expenditures, or (iii) adjusting domestic borrowing downward in order to meet the budget constraint

In the first scenario, the government chooses to pass the benefit of higher aid inflows to the private sector by reducing the tax effort. At the extreme, the government could decide to reduce this effort by the full amount of aid while holding aggregate public expenditures and borrowing constant.²⁵ This would imply the following condition:

$$\frac{\partial G}{\partial A} = 0, \frac{\partial T}{\partial A} = -1, \text{ and } \frac{\partial B}{\partial A} = 0 \dots\dots\dots 9$$

Under the second scenario, where expenditures increase in response to an increase in aid, tax effort may either increase or decrease depending on the form aid takes, and on the magnitude of the response of expenditures to aid. If the increase in expenditures is smaller than the increase in aid, or $0 < \partial G / \partial A < 1$, holding domestic borrowing unchanged (i.e. $\partial B / \partial A = 0$), tax effort would decline.²⁶ If the increase in expenditure is greater than the increase in aid, i.e. $\partial G / \partial A > 1$, tax revenue should increase. This could happen if aid is provided primarily in the form of project assistance that requires matching government spending and when aid is not fungible. Finally, in the third scenario, Gupta *et al.* (2003) considered the condition where aid induces a decrease in domestic borrowing. The authors suggest that the government decides not to spend foreign aid, i.e. $\partial G / \partial A = 0$, and builds up deposits with the banking system, so as to release resources for the private sector. Thus, the argument persists that, viewed in terms of the government's budget constraint, the response of the tax effort to increased aid flows could be positive, negative, or zero.

²⁵ Adam, C.S. and O'Connell, S.A (1999) also noted that a similar result would arise when higher aid inflows promote rent-seeking behavior by domestic vested interests that begin to clamor for tax exemptions or a weakening of efforts to collect taxes due. In the extreme case, this behavior can cause the tax effort to decline by the full amount of aid inflows. They argue that when institutions are initially weak, foreign aid undermines institutional capacity building (i.e., revenue-raising capacity). As such, foreign aid eventually finances the whole public budget.

²⁶ This asserts the existence of fungibility of aid, a situation where recipients reallocate resources that would have been spent for purposes now financed by foreign aid.

Generally, in much of the literature, it is argued that when governments receive foreign aid from overseas, their fiscal behavior would be affected negatively or positively. The literature consists of theoretical models that explain the reality. In the literature, it is assumed that the fiscal response model allows governments to set revenue and expenditure targets, and attempt to raise and allocate revenues required to met these targets so as to maximize utility. The literature treated aid, like tax and borrowing, as one of the forms of revenue. However, the way it is treated differs from model to model. While earlier fiscal response models treated aid as an exogenous policy variable, and excluded it from the utility function, other newly developed theoretical models treat aid as one of the endogenous variables.

2.2.3 Empirical Findings on the Fiscal Response to Aid

The aid-saving debate has been the central focus of discussions in the displacement theory to address the issue of aid fungibility. The debate relies on the initial work of Griffin (1970), which suggested different avenues through which aid may lead to a decline in domestic saving. This is mainly through its effects on government expenditure patterns and revenue generation. The debate further benefited from Heller's (1975) utility maximization model and the later extension by Mosley et al. (1987).

After developing the theoretical model of fiscal response, Heller (1975) undertook a cross-country assessment of eleven African countries.²⁷ According to the empirical finding by Heller (1975), aid increases investment but simultaneously facilitates a reduction in the level of domestic taxes and borrowing. However, Heller noted that the magnitude of these effects and the precise response of public consumption to aid vary depending on the type of aid under consideration. According to Heller's investigation, grants have a stronger pro-consumption bias, whereas loans are more pro-investment. Moreover, the empirical finding does not support the oft-repeated assertion that a shift from bilateral to multilateral aid will induce a greater increase in investment, at least not for the

²⁷ They are Nigeria, Ghana, Zambia, Kenya, Uganda, Tanzania, Malawi, Liberia, Ethiopia, Tunisia, and Morocco.

Anglophone countries. According to the result, only negligible differences emerge in the pattern of expenditure and revenue changes induced by either type of aid.

Following the theoretical and empirical work of Heller (1995), Mosley *et al.* (1987) and a large number of other studies such as Pack and Pack(1990, 1993),Khilji and Zampelli, (1991), Gupta (1993), Franco-Rodriguez *et al.* (1998), McGillivray and Ouattara(2003), Gupta *et al.*(2003) assessed the possible impact of foreign aid on the revenue and expenditure pattern of recipient governments. However, the results obtained from different empirical studies are different depending on the number of countries under consideration, i.e. whether it is a cross-country assessment or a single country case study. This may imply that the true situation is only revealed in country specific studies.²⁸

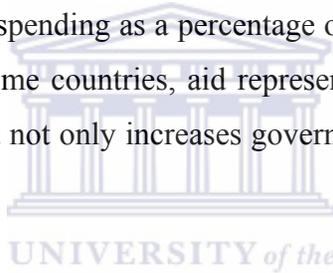
A study by Feyzioglu *et al.* (1998) using cross-country data from 14 developing countries found that aid is not fungible at an aggregate level in smaller samples, but increasing the number of countries makes aid fungible. Aid money increased government expenditures on a roughly one to one basis for the smaller samples. However, increasing the sample to 37 countries changed the results; a dollar's worth of aid led to significantly less than a dollar's worth of government expenditure. At sectoral levels, the study found that aid is fungible in the case of earmarked concessional loans for agriculture, education and energy, but not but not in the case of the transport and the communication sectors.

Moreover, Devarajan *et al.* (1998), in the work "What does aid to Africa finance", found that most aid inflows (90%) boosted government expenditure with no significant evidence of tax relief (pp.43). According to his findings, about half of the aid inflow is used to finance external debt service payments; one quarter financed investment and the other quarter offset current account deficits. Similar to Feyzioglu *et al.* (1998), Devarajan *et al.* (1998) also found a fungibility problem at the sectoral level. According to their empirical findings, aid is highly fungible in the health industry and agriculture sectors, while aid to the energy, transport and communication sectors is partially fungible.

²⁸ Donors give foreign aid to different countries for different reasons: economic, social, cultural, commercial and political. These reasons influence the impact of aid on the recipient expenditure pattern.

However, unlike the result by Feyzioglu *et al.* (1998), Devarajan *et al.* (1998) found aid to the education sector to be the least fungible.

By measuring government size as the total government expenditure to GDP ratio and aid dependence as the aid to GDP ratio, Remmer (2004) undertook a cross-country assessment for 120 countries from 1970 to 1999 to analyze the fiscal impact of foreign aid. The result shows that there exists a long run relationship between foreign aid and government expenditure. According to the empirical finding, holding other things constant, a one standard deviation increase in aid to GDP ratio will be translated over the long run in to a 2.9 percent increase in the government spending to GDP ratio. The result shows that this will be larger when the ratio of aid to government spending is larger; i.e. one standard deviation increase in aid to government spending ratio would lead to nearly a 18% increase in government spending as a percentage of GDP. Remmer (2004) argues that for middle and lower income countries, aid represents an important determinant of government expansion; and aid not only increases government spending but also reduces revenue generation.



In addition, another cross-country assessment by Gupta *et al.* (2003) of 107 countries covering the period 1970 to 2000 investigated whether the impact of aid on the revenue effort depends on the composition of aid, i.e. grants versus loans. The results indicate that concessional loans are generally associated with higher domestic revenue mobilization, while grants have the opposite effect. The effect is modest for the sample as a whole: a doubling of grants from an average of about 4 percent of GDP to 8 percent of GDP could decrease revenues by just 0.4 percentage points of GDP. This result speaks against efforts to increase the provision of grants to developing countries as well as the proposal to convert concessional loans into grants. According to the empirical finding from the assessment, the effect varies greatly depending on the level of corruption in the country. In countries plagued with high levels of corruption, any increase in aid would be fully offset by reduced revenue effort. Thus, according to Gupta *et al.* (2003), grants to these countries cannot be expected to increase the aggregate amount of resources

available to finance government expenditure; however, loans do not suffer from this drawback.

The difference in empirical findings among the various studies reviewed is also reflected in single country case studies. Using a time series analysis for Indonesia, Pack and Pack (1990) found that aid is used for the purposes intended by donors. The result shows that aid seems to have caused increases in domestic revenue and also a greater than proportional increase in both total and developmental expenditure, but not government consumption expenditure. At sectoral level, Pack and Pack (1990) noted that aid has led to higher expenditure on health and education. Gupta's (1993) empirical findings for India are also reasonably encouraging. From Gupta's finding, although a one unit increase in aid seems to lead to 0.73 unit increase in non-developmental expenditure, this increase in aid has led to an increase in development expenditure by 0.96 units. In contrast to Gupta (1993), however, Swaroop *et al.* (2000) found that aid doesn't affect any revenue or expenditure category in India, except non-developmental expenditure. They noted that foreign aid merely substitutes already earmarked government spending; the central government spends funds freed by aid on non-development activities. This implies that government expenditure choices are unaffected by external sources of finance.

On the other hand, Pack and Pack (1993) applied the same methodology, time series analysis, to the Dominican Republic and the result shows the existence of substantial diversion of foreign aid away from its intended purposes. According to this study, contrary to donor objectives, an additional dollar of foreign aid stimulates no net development expenditures, but decreases them by 5 cents per dollar of aid.²⁹ Similarly, a time series analysis by Khilji and Zampelli (1991) for Pakistan revealed that aid is highly fungible and has led to lower revenue. Like Khilji and Zampelli (1991), Franco-Rodriguez *et al.* (1998) assessed the fiscal impact of foreign aid in Pakistan using time series data from 1956 to 1995. The results suggest that both aid and borrowing are

²⁹ Accordingly, Pack and Pack (1993) argue that the more important foreign aid as a source of public revenues is, the greater the ability of donors to monitor changes in expenditure; and therefore, the more likely are the recipient's expenditures to reflect donor intentions.

allocated fairly evenly (about 50-50) between consumption and investment, whereas only some 15 per cent of tax revenue is allocated to investment. According to the result, most of these impacts of aid on government's fiscal behavior are negative. Thus, it is found that a one rupee change in the amount of aid disbursed results in a -1.97 change in consumption. Furthermore, confirming the usual concern in the fiscal response literature that aid may decrease tax revenue in recipient countries, each rupee change in aid money disbursed results in a -2.91 rupee change in taxation. And also its overall incremental effect on public expenditure was found to be negative. However, contrary to most of the findings, the regression result shows a slightly positive total incremental effect on investment (Franco-Rodriguez *et al.*, 1998: 1241-50).

Much of the literature reviewed so far focus on Asian countries, especially those country case studies. Although the result seems inconsistent with regards to the extent of the impact of foreign aid on different types of fiscal variables, most of the studies suggest that aid affects government fiscal behavior. In other words, foreign aid is found to be an important component of revenue to influence public spending decision making in recipient countries. Similarly, cross-country studies on African countries such as Heller (1975) and Devarajan *et al.* (1998) suggest that aid is used to finance consumption expenditure and to fill tax revenue gaps.

Most importantly, recent empirical studies on fiscal behavior of three African countries support the result obtained by earlier studies. A study by McGillivray and Ouattara(2003) using a data from 1975 – 1999 in Côte d'Ivoire shows that aid primarily goes to non-productive sectors. What makes this study different from others is that it divided total government expenditure into debt service expenditure and other government expenditures, summing up recurrent and capital expenditure together.³⁰ The result revealed that, in Côte d'Ivoire , a large share of both domestic revenue and foreign aid is used for debt repayment. Thus, contrary to the view of most studies on aid fungibility

³⁰ However, in most studies of fungibility and fiscal response , government expenditure is decomposed in to recurrent and capital, including debt service under the recurrent expenditure.

such as Griffin (1970), Boone (1996)³¹ and the World Bank (1998), which argues that foreign aid is used to finance government consumption, the empirical estimates show that debt servicing not consumption is the main destination of aid funds.

Moreover, in identifying the share of each revenue source allocated to debt servicing, McGillivray and Ouattara (2005) noted that around 29% of tax revenue and more than 60% of aid disbursements are used for debt repayments. However, it is observed that none of the borrowing is used for debt servicing. This finding is not consistent with earlier results of Pack and Pack (1993), who found that around 88 cents per dollar of aid are used for debt servicing in the Dominican Republic. Thus, both studies show that aid disbursement has a positive impact on debt servicing. In addition, Picking-up on the theoretical explanation of the impact of aid on tax revenue and borrowing by Gupta et al. (2003), McGillivray and Ouattara (2005) found that aid inflows discourage tax efforts and the government of Côte d'Ivoire substitutes borrowing for aid on a one-to-one basis (pp.57-126).

Another study of an African country is that by Njeru (2003) in Kenya. Using a time series data covering the period 1970 to 1999, Njeru (2003) concluded that there is a strong and positive relationship between total government expenditure and foreign aid; where a shilling increase in ODA leads to an 88 cents increase in government spending. Moreover, with regard to the fiscal impact on a disaggregated level of aid to project and program aid, the result shows that project aid significantly stimulates government expenditure on almost a 1:1 basis. But the effect of program aid is found to be insignificant. Likewise, by disaggregating expenditures into recurrent and development, Njeru (2003) found that aid is more fungible in the recurrent expenditure at about 59% as opposed to 19% in development expenditure (pp.3-45).³² The result concurs with most

³¹ In a study called '*Politics and the effectiveness of foreign aid*' Boone (1996) discusses the impact of a bad political regime and institutions on the allocation of aid resource for productive purposes. Boone used non-military aid flow as a proxy for foreign aid in a cross-country assessment of 96 countries (receiving less than 15% of their GNP) to identify whether foreign aid is used for investment or consumption. The regression result shows that foreign aid neither significantly increase investment nor benefit the poor; aid primarily goes to consumption by wealthy political elites, not the poor

³² This is because, according to Njeru (2003), project implementing agents in Kenya do not follow the clear distinction between recurrent and development expenditure modes of financing during the budgetary process as set by the Treasury.

studies on aid fungibility, which argue that foreign aid finances general government spending, and not the targeted development activities. Similarly, Camara (2004) used a time series analysis to comparatively assess the fiscal impact of project and program aid in Gambia, another African country. The result by Camara (2004) shows that the share of project aid and program aid directed to consumption is 38 and 39 percent respectively. Furthermore, the result reveals that about 68 percent of tax revenue and 40 percent of Government borrowing is used to support consumption.

Generally, empirical findings on the aid-fiscal behavior relationship show that aid positively affects government expenditure, i.e. both recurrent and capital expenditure. This implies that foreign aid is treated as part of total income so that it is allocated to both types of expenditure. Assuming that donors are not willing to finance any part of public consumption expenditure, *ex-ante*, this in turn implies the existence of a fungibility problem. However, although there may be conditions where donors finance some recurrent expenditure, it is unlikely that aid is donated for helping countries to service their debt. Thus, the results obtained by Pack and Pack (1993) and McGillivray and Ouattara (2003) from the Dominican Republic and Côte d'Ivoire respectively show that aid is purely fungible. Furthermore, despite the difference in the magnitude and extent of correlation, much of the literature shows that aid negatively affects tax revenue effort. This is consistent with the view of the Displacement theory of aid.

CHAPTER THREE

COUNTRY BACKGROUND

Ethiopia is found in the horn of Africa, which is the eastern-most part of the African landmass. The country is landlocked since 1993, when Eritrea got its independence and claimed ownership of the coastlines. Compared to its neighbors, even the rest of African countries, Ethiopia has a unique cultural and political history, and it rarely conforms to the stereotypes derived from Sub-Sahara African countries that experienced long periods of colonial rule. Unlike other African countries, Ethiopia has had no colonial experience, except the Italian short occupation from 1930-1935. As a result, Ethiopia had historically been somewhat isolated, having had relatively little interaction with the outside world. Thus, the country has had limited international trading relations and development cooperation with the outside world. This, coupled with internal problems,³³ has had an impact on the economic development of the country.

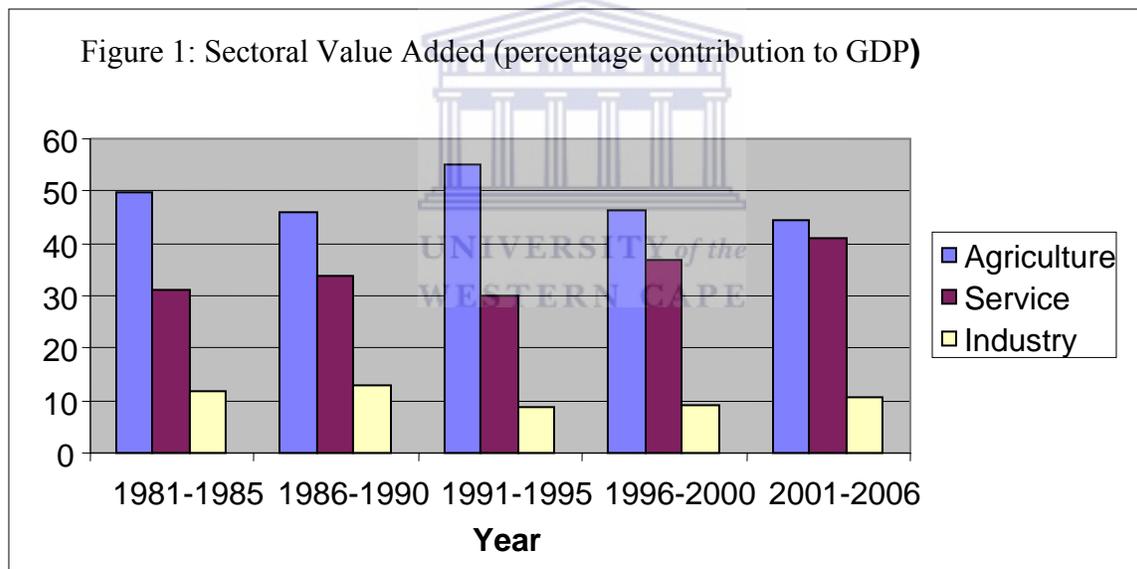
3.1 Macroeconomic Overview of Ethiopia

The economic system in Ethiopia has been highly influenced by the political system that the country experienced for the past four decades. The pre 1974 political economy of the country, generally, was based on a market oriented ideology that gave priority to the industrial sector. After the imperial regime was ousted by the military junta, in 1974, the macroeconomic policy was changed to a centralized and state led economic system. The socialist regime nationalized all private firms from the imperial era and focused on large scale and co-operative farming system where land was owned by the state. The down fall of the military regime in 1991 has changed the economy, once again, to its imperial root. The current ruling party, after assuming power in 1991, opted for a market oriented economic system. They introduced a series of macroeconomic reforms including privatization of some state owned firms. However, the government has resisted

³³ Ethiopia, despite the fact that it is one of the oldest independent nations with continues ancient civilization, has never experienced a democratic tradition in the political spectrum. As a political culture, Ethiopian rulers at different times resisted peaceful power transition, and this led to civil war and civil unrest. This affected the economy negatively.

privatizing some large-scale state owned firms and the land.³⁴ The land tenure system is still under strong control of the government.

Having passed through a variety of challenging situations, Ethiopia has remained one of the poorest countries in the world. Economic indicators show that the level of poverty is very bad even by Sub-Saharan Africa standards. According to a 2006 estimate, 44 percent of the population live in absolute poverty earning less than USD1 a day and around 81 percent of the population live below a poverty line of USD 2 a day; the per capita income is the lowest in the world, USD 130, and one-fifth of the Sub-Saharan Africa's average.³⁵ Ethiopia's poverty-stricken economy is based on a rain fed agriculture that suffers from frequent droughts and poor cultivation practices. This sector, being the backbone of the economy, contributes for almost half of the GDP, 60% of exports, and 80% of employment (Geda and Gedfe, 2005:63).



Source: the author's computation based on the data from Penn World Table (PWT) 6.1

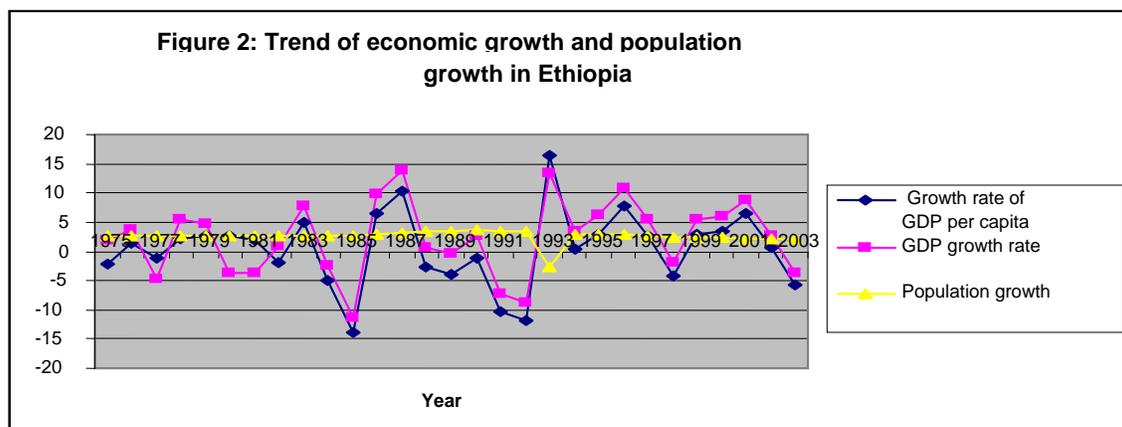
³⁴The private sector is not allowed to participate in the sectors, such as telecommunication, the airline, the post office, the electric power corporation. With regards to land, the ruling party claims that it has a genuine commitment to improve and uplift the life of the rural poor. The ruling party, thus, believes that this is the only way to ensure that all the rural poor has access to means of production, and would not be exposed to the exploitation by urban elites. However this might have a repercussion on the development of the industrial sector since investors can not use their land as collateral. The land tenure issue, therefore, has remained a big issue in the political debate between the oppositions and the ruling party. While the former argues for land privatization, the latter resists undertaking this reform. The ruling party considers land privatization to be a measure which would undermine the wellbeing of the life of the rural majority.

³⁵ World Bank 2007, Country Profile: Ethiopia ; <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/ETHIOPIAEXTN/0,,menuPK:295939~pagePK:141132~piPK:141107~theSitePK:295930,00.html>

The service and industrial sectors are the second and third most important contributors to GDP. This can be seen from the data in figure 1, above. As can be seen in the figure, the of the economy has been dominated by the agriculture sector for the past 25 years but recently the service sector's share of the GDP increased to more than 40%. The agriculture sector contributed the highest percentage in the year 1991-1995, (55%), but its contribution decreased to a historical low level of about 44% in the period 2001-2006.

Without any strong competition from the industrial sector, the trade-off in the sectoral contribution is between the service and the agriculture sector; service value added decreases when the agricultural value added increases and vice versa. For example, when the contribution of agriculture sector and the service sector decreased and increased respectively by around 10 percent from 1991-1995 to 2001-2002, the contribution of the industrial sector changed only by around 2 percent over the same period. The figure shows that the percentage contribution of the industrial sector has fluctuated within a narrow band around the 10% level.

Given this structure of the economy, the growth of the economy has been fluctuating from year to year. For example, during the military regime (1974/75 –1989/90) the GDP growth rate decelerated to on average to 2.3%, a growth rate below the estimated population growth of 2.9% (Geda, 2002:77). As a result, the per capita growth was negative (-0.4% per year). The overall performance of the economy for the period 1975-2003, is depicted in figure 2, below.



Source: Penn World Table 6.1 and WDI (various years, WORLD BANK CD-ROM)

As can be seen from the figure, the worst growth performance was experienced in 1985, when growth of GDP and GDP per capita had decelerated by around 11 and 13 percent respectively. However, in the following two years, 1986 and 1987, the economy registered a very good performance. As can be seen from the figure, especially in 1987, GDP and GDP per capita income grew at 13 percent and 10 percent respectively. Some factors can be mentioned as possible causes of the poor performance of the economy during the military regime. In the period 1975-1978, for example, the growth rate averaged 0.3% (the per capita income declined by 2.3% a year). The instability induced by the emerging new policies of the military government as well as the war with Somalia could explain a good part of this dismal growth performance. Similarly, the poor performance of the economy in 1984 and 1985 could be associated with the severe drought that the country had experienced in its history.

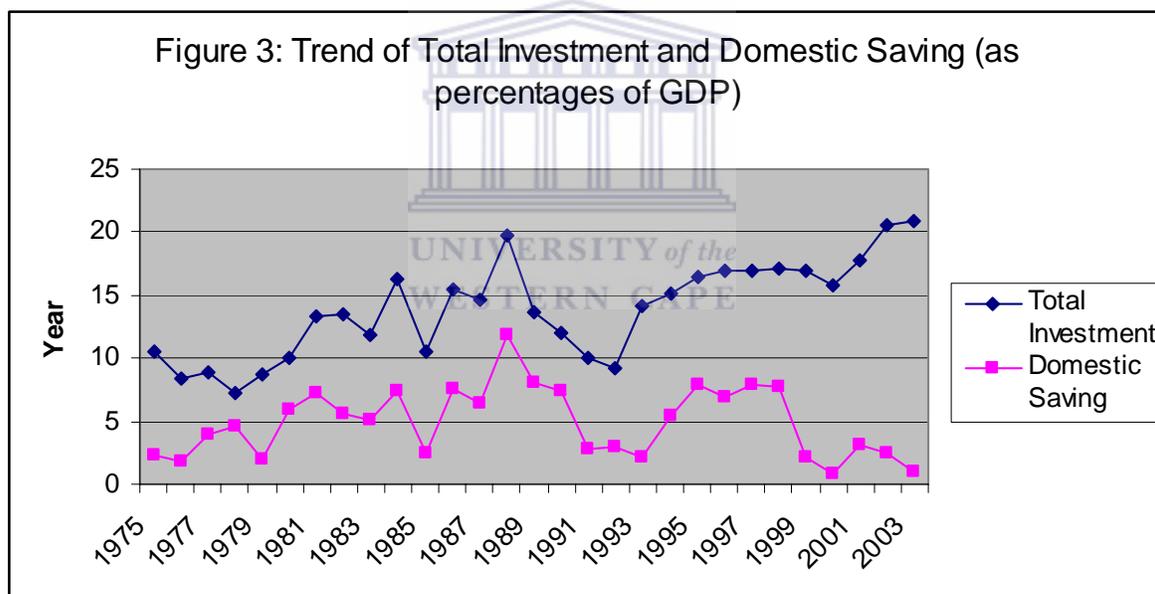
On the other hand, although there were fluctuations, the overall performance of the economy has improved in the post military regime phase. Except in the four periods, 1991, 1992, 1998 and 2003 when GDP growth had been negative by around 7.1, 8.9, 1.2 and 3.7 percent respectively, the economy registered positive growth rates for the rest of the period. The GDP growth rate had registered higher rates in 1993, 1996 and 2001, around 13, 10, and 9 percent respectively. Correspondingly, the data shows that per capita income grew in 1993 at the highest rate, 16.5 percent,³⁶ for the first time in almost two decades. However, like the fall of GDP growth rate in the above four periods, growth of per capita income had fallen by around 10 and 12 percent in 1991 and 1992 respectively, and by 4 and 6 percent in 1998 and 2003 respectively. That is, per capita income had registered negative values when its corresponding GDP growth decelerated.

Similar to their analysis of the different factors that influenced the performance of the economy during the military regime, Geda and Degefe (1998) have mentioned different possible causes for the ups and downs of the growth performance of the Ethiopian economy in the post reform period. For example, 1991 and 1992 were transition periods

³⁶ This is the period when population growth had decelerated by 2.8 percent. There is no clear evidence on the cause of the decline of the population growth at that time; it might be because of the Eritrean independence and the consequent change in the population statistics. Despite the real cause, however, the figure shows that population growth rate and per capita income are negatively related.

when the new ruling party was just busy sorting out some political issues, and thus, there was not any meaningful macroeconomic policy that could help the economy to perform well. The new government started implementing its policy reform in 1993, and the economy performed well in the following four years. On the other hand, the fall in the growth performance in 1998 could be associated with the devastating border war with Eritrea. Similarly, the poor performance in 2003 was due to the severe drought that the country experienced for the first time since 1984 and 1985.

Given the different factors that affected the performance of Ethiopian economy, saving and investment are the key variables believed to be a proximate source of growth (Geda, 2002). The following figure shows the trends in gross capital formation and domestic savings for the period 1975-2003.



Source: Penn World Table (PWT 6.1)

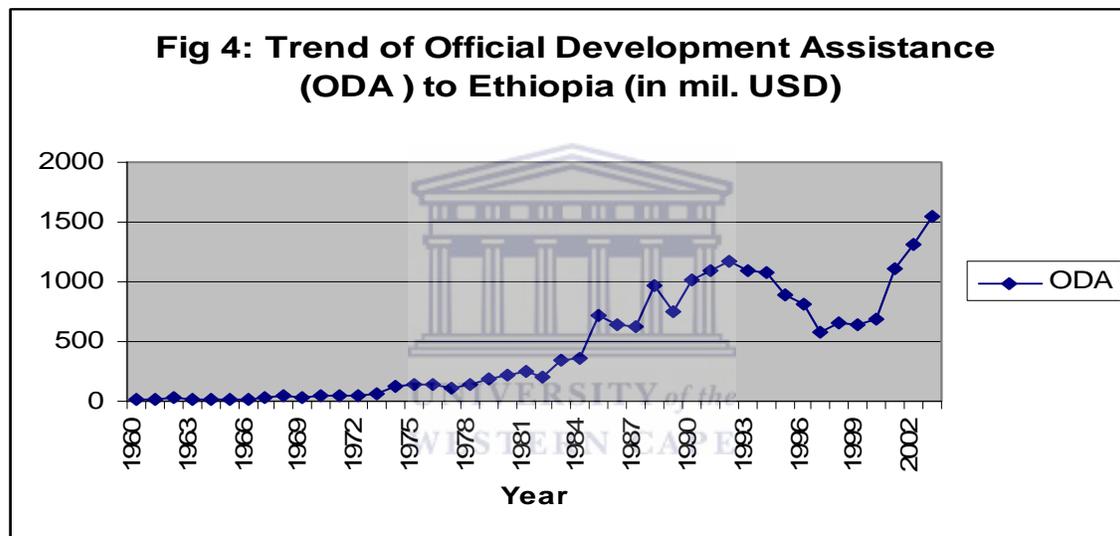
Like difference in the growth of the economy, difference in the investment and saving level is also apparent between the two regimes. As can be seen from the figure, there was ups and downs in the level of both investment and saving in the military regime. Moreover, the saving level had never reached 10 percent, except for in 1988 when it reached 11.8 percent. And it reached its lowest level 1.9 percent in 1976. The investment trend also shows that it had never reached 20 percent of GDP. Even, it exceeded 15

percent only in the three periods, 1984, 1986 and 1988. The poor performance of capital formation had worsened during the last period before the downfall of the military regime. This could be associated with shift of resources from capital expenditure to the defense sector. The figure shows a continuous downward trend of both variables, after they had reached the maximum level in 1988. The downward trend was reversed following the reform by the new government. Given 1991 and 1992 as transition periods, the level of investment has been increasing continuously since 1993, and it was above 20 percent in 2002 and 2003. Although public investment has remained crucial even after the reform period, the rise in the investment can also be associated with the active participation of the private sector (Geda, 2002).

In general, there are three important facts that emerge from the above figure. First, investment level in the post reform periods is much more than the investment level in the military regime. Second, domestic saving as a percentage of GDP under the military regime was larger than in the post reform periods. The third important point is that, comparing the resource gap between the two regimes, the difference between investment and domestic saving is much bigger in the post reform period than under the military regime. The military regime had experienced the highest gap, 8.7 percent, in 1984. The gap more than doubled in the post reform period, 18.2 and 19.9 percent in 2002 and 2003 respectively. Excluding the transition periods, 1991 and 1992, the annual gap between investment and domestic saving in the post reform period was an average of 12.8 percent while this annual resource gap averaged only 6.5 percent under the military regime. Regardless of the difference in the level of the resource gap between the two regimes, the important message of the data is that the country has been other sources of financing to fill the gap once the military regime was overthrown. Although the governments could use domestic and external borrowing as sources of financing the gap, it is to be expected that foreign aid could be also an important source of finance.

3.2 How large is Aid to Ethiopia?

Ethiopia, with no history of colonial relations with the western world, started receiving aid in the modern sense after it joined the World Bank in the late 1940s. Aid to Ethiopia could take two forms, humanitarian and developmental aid. Due to its economic reliance on the agriculture sector, which is highly exposed to the vagaries of nature, Ethiopia is one of the few countries that are receiving a substantial amount of food aid. The country had received a total of 3392 million USD in the form of food aid during the period 1996-2002(World Bank, 2004: 61). This is equivalent to one-third of the developmental aid (ODA) that the country received for this period.³⁷



Source: Based on data from WDI (World Bank CD-ROM)

As can be seen from figure 4, there had been a small and continues build up in the level of ODA until 1987, after which the aid level started fluctuating. The annual inflow of ODA to Ethiopia averaged \$ 36.77 million from 1960 to 1973 and this rose to \$ 406.96 million during the military regime (from 1974- 1990). This shows that the annual inflow of ODA during the military regime was 11 times more than the annual ODA inflow during the last 15 years of the imperial regime. Some argue, however, that such a big difference in the ODA level between the two regimes was not because that the military regime had got much more international political support than the imperial regime.

³⁷ This is based on the data in figure 4, from WDI. Since this paper is interested only on assessing the growth effect of ODA, food aid will not be considered as part of the discussion.

Rather, it was because of the general increase in the aid level to all recipient countries (World Bank, 2004).

The military government was perceived by most donors as being on the “wrong” political side, being an ally of the Soviet Union. As a result, western donors, especially bilateral donors, were interested to give more of humanitarian and less developmental aid; thus a substantial portion of developmental aid was flowing from multilateral sources. This was reflected in the share of bilateral aid as percentage of the total. From 1974 to 1979, the share of ODA that was channeled through bilateral sources averaged 49 percent; but this share declined to an average of 40 percent from 1980 to 1990 (Geda and Degfe, 1998:66).³⁸ It is believed, therefore, that the aid inflow would have been much more than depicted by the figures had it not been for the military junta’s rejection of western oriented ideologies (Furtado and James, 2007).

Despite the decline in the level of aid inflow in the late 1990s, the average annual inflow of ODA continued rising after the downfall of the socialist regime in 1991.³⁹ With an average annual inflow of USD 975.82 million (for the period 1991-2003), the level of ODA inflow increased continuously until 1995, then started declining and reached USD 578.51 million 1998 the lowest level of aid the new government received ever since it came to power.⁴⁰ However, this was nevertheless more than the average annual aid inflow during the military regime. During the military regime, for example, the annual inflow of ODA only exceeded USD 500 million from 1984 onwards, and the average annual inflow for the entire period was well below this amount.

³⁸ The last ten years of the military regime were when the government refused to align its economic and political policies to the west and it was the period of an intensive civil war between the government and resistant liberation army.

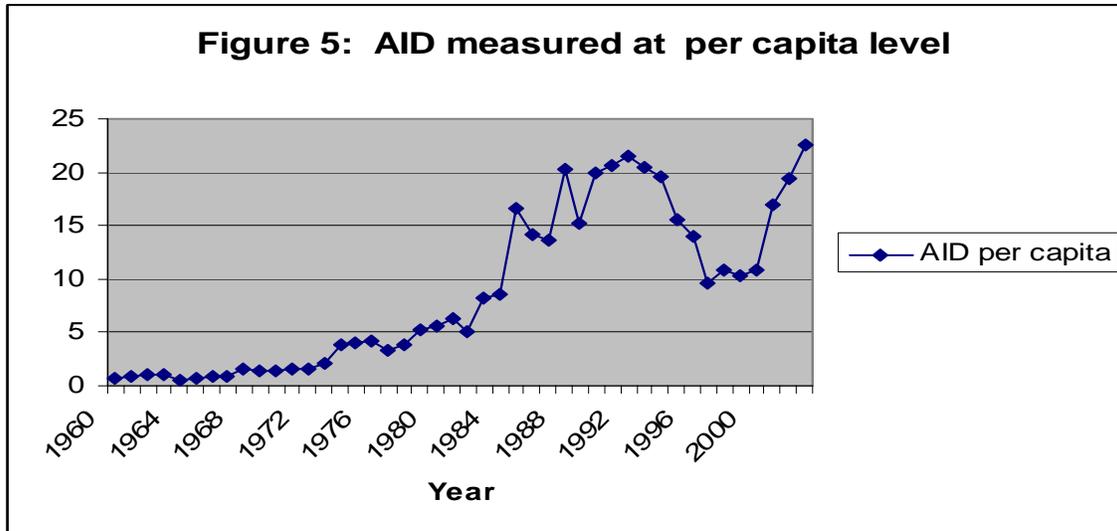
³⁹ As mentioned before, the new government initiated market based structural reforms focusing on achieving sustainable economic growth and medium term financial viability that are perceived to be essential for poverty reduction. In its development agenda, which concentrates on the improvement of social welfare, the government recognizes that poverty reduction is not possible without sustained economic growth. Different donors have showed more interest to give more development assistant for the new government than for its socialist predecessor.

The overall decline in the level of foreign aid in the late 1990s was associated with the breaking out of the border war with Eritrea. Donors felt uncomfortable with the war, and most bilateral donors withheld the aid they promised to the government. For example, the average share of bilateral aid in the period 1991 to 1997 amounted to 60.65 percent of total ODA inflow; and this share fell to 40.75 percent during the war with Eritrea (World Bank, 2004: 52). As a result, most sectoral programs, especially the health and education sectors were left unfunded. This damaged the relationship between donors and the Ethiopian government; the government considered most of the bilateral donors as unreliable partners. Although the war ended in 2000 and donors made a slow return, the share of bilateral aid remained low until 2003, amounting to an average share of 40.45 percent (Furtado and Smith, 2007: 34).

However, regardless of decline in the relative share of bilateral aid, total aid from both sources has been increasing from year to year since 2000. This was mainly because of the new focus of the international development co-operation to achieve the stated Millennium Development Goals (MDG). This growth has been accompanied by a shift to new modalities, particularly untied budget support and HIPC relief assistance.⁴¹ As a result, average aid inflow had increased more than double in 2001, 2002 and 2003 compared to 1998 and 1999. This can be evidenced by the upward sloping curve of ODA in figure 4.

So far, ODA was measured in absolute terms. It is difficult, however, to tell exactly whether the amount is smaller or greater, in relative terms, than the amount of aid that other poor countries received over the same period of time. A good measure of aid for such comparison is to use relative terms either with respect to the population size or other macro variables, such as GDP, public expenditure and revenue.

⁴¹Budget support is part of the official development assistance. But what makes it different from other forms of support is that the aid is given to the beneficiary government without any pre-defined conditionality; thus the government has the discretion to treat the aid as its own revenue in the budget process. Donors reached a consensus to give direct budget support because they believed that it would make aid more effective by increasing partnership and sense of ownership of aid resources by recipients (Abrar & Mosley, 2005). Moreover, Ethiopia was acknowledged by the international donor community as a Highly Indebted Poor Country (HIPC) in 2000. Thus, the country got a total of USD 1500 million debt cancellation from 2001- 2004(MOFED, 2005: 22).



Source: the author's computation based on the data from WDI (Various years)

Figure 5 shows the annual inflow of foreign aid with respect to total population of the country. Although the level of aid inflow has been increasing continuously, the level of this aid is much lower in per capita terms than what most other developing countries had been receiving. The figure shows that the average annual aid per capita inflow during the last periods of the imperial regime, 1960-1974 amounted to USD 1.28 and this had increased to USD 9.30 and 16.33 during the military regime and for the period 1991-2003 respectively. In other words, the figure shows that annual inflow of aid per capita had never reached USD 2 from 1960- 1973. However, annual aid per capita inflow for Sub Saharan African countries had averaged USD 9 from 1960-1970; USD 23 from 1974-1990 and USD 49 since 1991 (CABRI, 2005:102). Moreover, the aid per capita for all least developing countries had averaged USD 21 from 1991-2000 (World Bank, 2004:49).

The lower aid per capita, relative to the aid that other poor countries received, can be explained by a number of different factors. First, unlike other developing countries, Ethiopia doesn't have a former colonizer that feels compelled to give bilateral support.⁴²

⁴² Historically, Ethiopia has been receiving the larger share of its bilateral aid from United States, Italy, Japan, and Canada, followed in almost equal shares by Germany, Norway, Ireland and the Netherlands (Furtado and James, 2007). The annual average inflow for the period 1997 to 2003 from the top three bilateral donors USA, Japan and Canada amounted to USD 133, 41 and 36 million respectively. This was followed by aid from Italy, Germany and Norway amounted to USD 33, 19.5 and 19 million respectively. Aid from Ireland and the Netherlands had amounted to USD 18.9 and 17.8 million respectively. Nevertheless, Ethiopia received a relatively smaller amount of aid from the

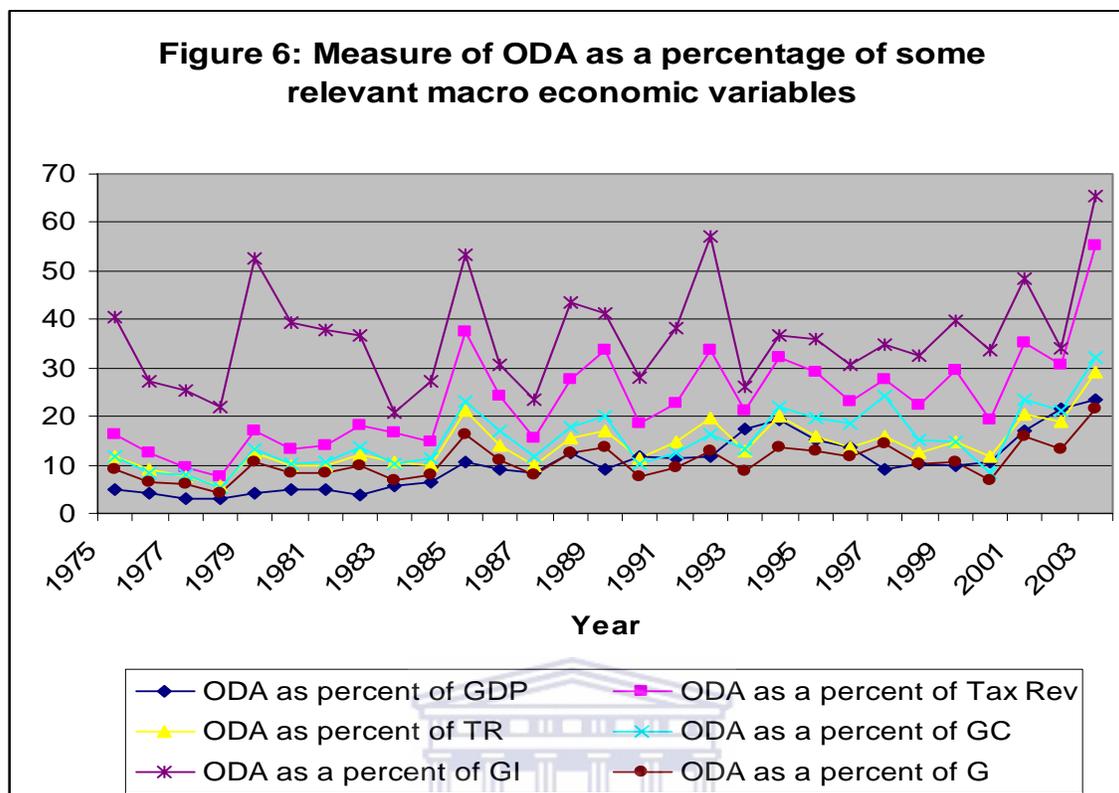
This can be confirmed by the generally lower level of bilateral aid relative to the multilateral aid, which is unlike the experience of most developing countries that have historical colonial relationship with major bilateral donors. Secondly, as discussed before, the political ideology of the military regime and the border war with Eritrea had contributed to the lower level of aid inflow in absolute terms, hence to lower aid per capita. The other most important reason could be the substantial amount of food aid that the country is receiving. For fixed aid budget donors, giving a large amount of food aid to Ethiopia would reduce the amount of developmental aid that the country would have got otherwise (World Bank, 2004).

Thus, by comparing the amount of aid per capita inflow and the level of poverty in the country, one may conclude that Ethiopia is treated unfairly in the arena of the international development co-operation. However, if one compares aid in terms of macro-economic variables, Ethiopia is doing much better. Since Ethiopia is one of the most highly populated countries in Africa, the aid inflow might have been absorbed by the population size. With an average growth rate of 2.77 percent since 1960s, the total population was around 51 million in 1990 and 66.7 million in 2001.⁴³ To compare the aid Ethiopia receives, it may be more appropriate to use economic measures than aid in per capita terms.

The magnitude of aid inflow measured as percentage of relevant macro parameters is presented in figure 6. Measured as a proportion of GDP, aid increased from an annual average of 6.3 percent in the late 1970s and 1980s to 12.9 percent in the 1990s. The percentage had increased substantially in the period 2001 to 2003, with annual inflows of 17, 21.6 and 23 percent of GDP respectively. Similarly, foreign aid as a proportion of total government revenue had increased from 11.8 percent in the late 1970s and 1980s to 15 percent in the 1990s, and to 22.8 percent from 2000-2003.

three top historical colonizers of the third world UK, France and Spain, amounting to USD 14, 5.6 and 0.3 million respectively. In countries, these are the countries giving substantial amounts of bilateral aid to most developing countries in Africa, Asia and Latin America (World Bank, 2004:72).

⁴³ The author's computation, based on the data from WDI(various years, WORLD BANK CD-ROM)



Source: the author's own computation ⁴⁴

The relative magnitude of aid with respect to tax revenue had also increased significantly. Starting from an annual average inflow of below 20 percent until mid-1980s, aid as a percentage of tax revenue had increased to more than 30 percent in the late 1980s and 1990s. The proportion had reached 55 percent in 2003.

Aid as a percentage of other fiscal variables such as total government expenditure and its components had increased from decade to decade. For example, the annual average inflow of ODA measured against total government expenditure had increased from 9 percent in the late 1970s and the 1980s to 11.8 percent in the 1990s and 16.8 percent in the period 2000-2003. Similar increases had been registered with regard to ODA as a percentage of government consumption and government investment. ODA as a percentage of government investment had increased from annual average of 34 percent in

⁴⁴ These percentages were calculated based on the data from WDI and MOFED (Various years). The variables are defined as follows: GDP is Gross Domestic product; Tax Rev is tax revenue; TR is total revenue excluding grants; GI is government investment; GC is government consumption and; G is total government expenditure (GC+GI).

the late 1975 and 1980s to 36.6 percent in the 1990s, and to 49 percent from 2000 -2003. The highest percentage of annual inflow, 65 percent, was registered in 2003. Likewise, the annual average inflow of ODA as a percentage of government consumption expenditure had increased to more than double, from 12 percent before 1990 to 26 percent in the period 2000 to 2003. This was after a small build up in the 1990s, averaging 16 percent.

The relative measure of foreign aid with respect to the aforementioned macro variables sends two important messages. First, despite the fluctuation in the level of foreign aid as a percentage of the variables, the overall figure shows that aid inflow has increased for the past three decades. Secondly, the relative size of ODA with respect to total government expenditure and revenue shows the degree of dependence of the government on aid resource to finance its expenditures. For a given amount of expenditure, if the government fails to collect its own revenue, it would need substantial amounts of foreign aid to fill its resource gap.⁴⁵ This suggests that the government has no option but to reduce its investment expenditure at the time when donors decide to give less aid and no other sources of financing (Geda and Degefe, 1998).

Generally, the trend of aid inflow shows that Ethiopia has been receiving foreign aid for many years. Ethiopia is also one of the few countries that have been receiving large amount of food aid up to the present. The official development assistance to the country comes both from bilateral as well as multilateral sources. Data presented above shows that, unlike other countries, bilateral development co-operation is relatively less important in Ethiopia, with a substantial share of the official assistance being channeled through multilateral sources. Evidences show that Ethiopia is receiving much less aid per capita than the average that poor countries are receiving. However, the amount seems large enough when measured against other macro parameters.

⁴⁵ The government first allocates the available revenues to recurrent expenditures, then to capital expenditures, if there is any surplus.

3.3 The Composition of Government Expenditure and Revenue

3.3.1 Government Expenditure

During the study period, 1975–2005, the mean total government expenditure as a proportion of GDP was 28.50 percent. The total budgetary expenditure comprises two main components: recurrent expenditure and capital expenditure (also referred as development expenditures). The capital expenditure comprises the total of expenditures from all the development activities, mainly economic and social development, undertaken by the ministries. During the study period, as can be seen from table 1, the development expenditure accounted for about 31 percent of total government expenditure; and is the most vulnerable to budget reductions (Geda and Degfe, 2005). This implies, as discussed before, that developmental budget is reliant on donor funding.

Table 6. Composition of Government Expenditure (in percent)

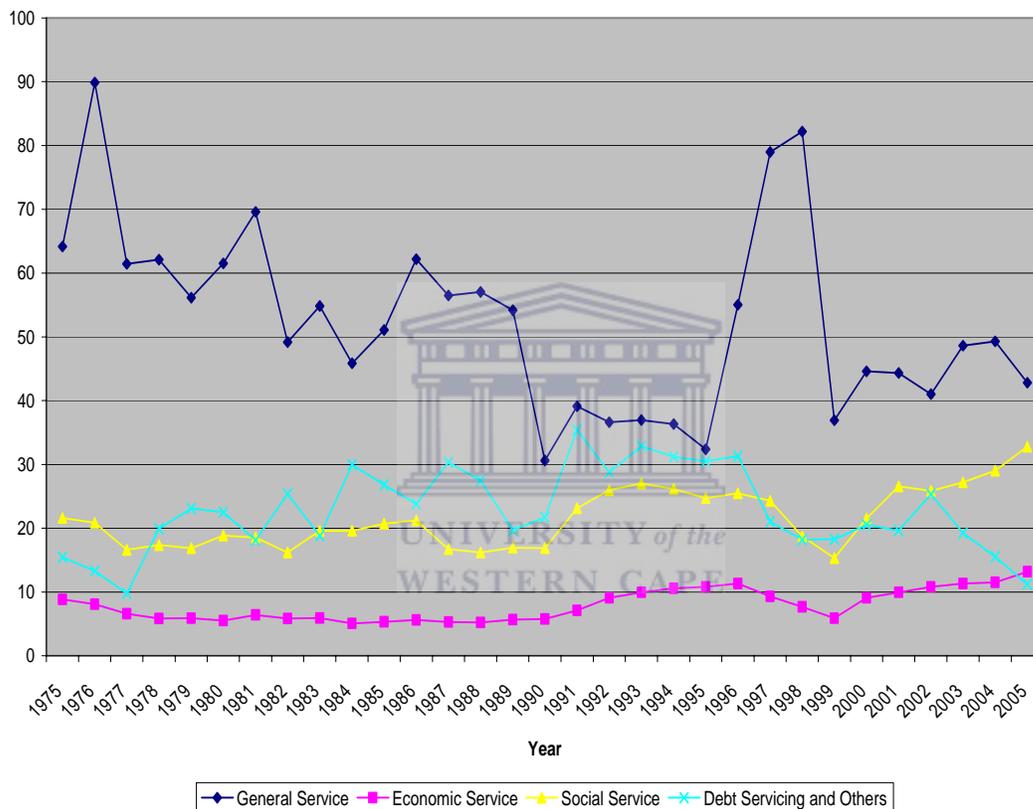
Year	1975-79	1980-84	1985-89	1990-94	1995-99	2000-05
Recurrent Expenditure	78.44	71.78	68.65	69.18	66.27	60.67
Capital Expenditure	21.56	28.22	31.35	30.82	33.73	39.33
Total Government Expenditure	100	100	100	100	100	100

Source: 1. The author's own computation based on the data from MOFED (Various years)

The recurrent expenditure contains expenditures on general services, economic services, social services and debt servicing. The lion share of total government expenditure goes to recurrent expenditure; and it accounted for about 69 percent of the total during the period 1975-2005. Looking at the percentage share of each sub category, figure 2 shows that expenditure on general service was the highest followed by debt servicing and expenditure on social services. Expenditure on economic services was the lowest during the whole study period. As can be seen from the same figures, however, debt servicing had fallen below the expenditure on social service after 2000. This might be for two reasons. First, the general increase in social service expenditure since 2000 could be because of efforts towards the achievement of one of the Millennium Development Goals (MDGs), with respect to improving the social sector. Second, the decline in debt

servicing expenditure relative to social servicing expenditure might be due to the debt relief granted by the international community. Ethiopia has been identified as one of the Highly Indebted Poor Countries (HIPC) in 2001. As a result of this, the country has got debt cancellation from several donor countries and organizations; and this decreased the cost of debt servicing.

Figure.7 Composition of Recurrent Expenditure(in percentages)



Source: The author’s own computation based on the data from MOFED (Various years)

Expenditure on general services mainly includes the budget expenditure on national defense, expenditure on justice and other recurrent expenditures, which government departments uses for day-to-day activities. In the general service expenditure, the lion share goes to the defense sector. For example, during the Derg regime, from 1975-1990, about 75 percent of the recurrent expenditure on general government service was for defense. The share, although lower than during the Derg regime, is still dominant. After the fall of the military government, the share of defense expenditure from general service expenditure averaged 55 percent; i.e. it fell by 20 percent after the 1991 revolution. The

share of defense expenditure had been significant even with respect to total recurrent expenditure; the share was 44 percent during the Derg regime and it fell to 25 percent during the period 1991-2005.⁴⁶

Generally, one can categorize the expenditure account of the Ethiopian government into recurrent and capital expenditure. During the study period, the average recurrent expenditure accounted for about 61 percent of the total government expenditure. This expenditure account consists of expenditures on general government services, economic services, social services and debt servicing. On the other hand, the capital or developmental expenditure account consists of those expenditures mainly on economic and social development activities. In the recurrent expenditure, the largest share is accounted to the general government services.

3.3.2 Government Revenue

As can be seen from the table below, the revenue of the Ethiopian government is composed of recurrent revenue, which includes tax and non-tax revenue, external assistance (ODA) and borrowing. Tax and non-tax revenue, followed by borrowing and ODA, contributed for the largest share of government revenue in the country during the study period. Being the poorest country in the world that relied on a subsistence economy, tax and non-tax revenue accounted only for 23 percent of GDP⁴⁷.

Table 7. Composition of Government Revenue

Year	1975-79	1980-84	1985-89	1990-94	1995-99	2000-05
Tax and Non-tax revenue	74.8	87.3	72.4	53.7	68.8	59.8
External Assist.	4.2	3.4	8.1	9.9	11	17.7
Borrowing	21.0	9.3	19.5	36.4	19.2	25.5
Total	100	100	100	100	100	100

Source: The researcher's own computation based on the data from MOFED(Various years).

⁴⁶ Computed using the data from MOFED(various years)

⁴⁷ Computed based on the data from WDI and MOFED

The above table also shows that the inflow of external assistance has been increasing continuously. During the first decade of the military regime, the percentage share of external assistance was much lower than both the recurrent revenue and borrowing; however, it started with a small build up since the late 1980s. On the other hand, the percentage contribution of tax and non-tax revenue was larger during the military regime than after the 1991 revolution. However, the variation in the percentage share of budget financing through borrowing had been moving within a narrow band throughout the study period. The borrowing component of government revenue shows that the budget deficit had persisted despite a series of fiscal reforms by the new government to achieve a balanced budget.

In sum, the study shows that Ethiopian authorities have three different sources of revenue to finance their expenditures. These sources of revenue are tax and non-tax revenue, foreign assistance and borrowing. Although, there is a variation in the percentage contribution of each form of revenue, the average figure shows that the lion share of government revenue comes from tax and non-tax revenue. Although Ethiopia is the one of the poorest countries in the world and one could expect the government's capacity to raise its own tax revenue is curtailed due to the poor economy, the larger share of the government internal revenue comes from taxation, especially from income and import taxes.

CHAPTER FOUR

DATA AND RESEARCH METHODOLOGY

4.1 Data

The data used in this paper has a quantitative nature and collected from secondary sources. It is also a time series data covering the period 1975 to 2005. The choice of the period of study is based on data availability.⁴⁸ The values of each variable are expressed in millions of Ethiopian Birr at constant price 2000. The researcher used a technique of desktop approach to obtain the data from different publications and documents. The budgetary data were collected from annual recurrent and development expenditure estimates and budget reports by the government. In this regard, an important source of data is the annual publication by the Ministry of Finance and Economic Development (MOFED) on “Negarit Gazeta”.⁴⁹ Thus, the time series data on capital expenditure, recurrent expenditure and tax and non-tax revenue were obtained from MOFED data base of various years.

Data on borrowing is obtained as a residual calculated from the difference between total expenditure and the other sources of revenue, i.e. tax and non-tax revenue and foreign aid; this is a standard practice in the fiscal response literature.⁵⁰ Data on Gross Domestic Product (GDP), domestic saving, Private investment, import and foreign aid were obtained from World Development Indicator (WDI) various years. Based on the definition in chapter two, foreign aid refers to the Official Development Assistance (ODA) that includes both concessionary loans and grants transferred from official bilateral and multilateral sources. However, due to inconsistency and missing values in some years, it was not possible to obtain ODA in its disaggregated form as loan and grant.

⁴⁸ What makes time series study very difficult is that, there has to be a consistent data with out any missing value in a single year; otherwise it would be difficult to estimate the missing value and make give analysis about the actual figure.

⁴⁹ Negarit Gazeta is just a news paper by the government, which contains only government proclamations, legislations and amendments of different policies and laws. Accordingly, the ministry discloses all the information with regards to the annual budget process of the government.

⁵⁰ Since concessionary loans are included in ODA, in this particular study, borrowing refers only to domestic borrowing.

Non-stationarity is an important problem that makes estimation and regression results spurious in a time series analysis. Thus, before undertaking different correlation and regression tests, the time series value of each variable was tested for stationarity using the Augmented Dickey-Fuller (ADF) test. The test result revealed that some of the variables were found to be stationary at their level, while others not. The Unit-Root test showed that only data on foreign aid and domestic saving were stationary at their level at 5 percent level of significance. However, the data on recurrent expenditure, capital expenditure, tax revenue as well as borrowing were found non-stationary. As a result, adjustment was taken on the data by considering their first differences to make them stationary; and they become stationary at 10 percent level of significance after taking their first difference.

4.2 Model Specification

Given equation 1, 5, 6 and 7 in chapter two as pillars in the fiscal response model, two different groups of equation were derived in order to assess the direct and indirect impact of foreign aid on government fiscal behavior in Ethiopia. The first group represents structural equations and the second group represents the reduced-form equations. Moreover, in order to derive the structural equations, as commonly done in the fiscal response literature, the first step is to use a Lagrangian system of utility maximization by combining the objective function(6) and the two constraint equations (5 and 7) as follows;

$$L = \alpha_0 - \frac{\alpha_1}{2}(I_g - I_g^*)^2 - \frac{\alpha_2}{2}(C_g - C_g^*)^2 - \frac{\alpha_3}{2}(T - T^*)^2 - \frac{\alpha_4}{2}(A - A^*)^2 - \frac{\alpha_5}{2}(B - B^*)^2 - \lambda_1(I_g + C_g - T - A - B) - \lambda_2(C_g - \rho_1 T - \rho_2 A - \rho_3 B) \dots \dots \dots 10$$

Where λ_1 and λ_2 are the Lagrange multipliers

Since it is all about the problem of utility maximization, taking the first derivative of the Lagrange (L) with respect to each endogenous variable and the Lagrange multipliers will give us a series of first - order conditions. These are;

$$\frac{\partial L}{\partial I_g} = -\alpha_1(I_g - I_g^*) + \lambda_1 = 0 \dots\dots\dots 11$$

$$\frac{\partial L}{\partial C_g} = -\alpha_2(C_g - C_g^*) + \lambda_1 + \lambda_2 = 0 \dots\dots\dots 12$$

$$\frac{\partial L}{\partial T} = -\alpha_3(T - T^*) - \lambda_1 - \lambda_2 \rho_1 = 0 \dots\dots\dots 13$$

$$\frac{\partial L}{\partial A} = -\alpha_4(A - A^*) - \lambda_1 - \lambda_2 \rho_2 = 0 \dots\dots\dots 14$$

$$\frac{\partial L}{\partial B} = -\alpha_5(B - B^*) - \lambda_1 - \lambda_2 \rho_2 = 0 \dots\dots\dots 15$$

$$\frac{\partial L}{\partial \lambda_1} = I_g + C_g - T - A - B = 0 \dots\dots\dots 16$$

$$\frac{\partial L}{\partial \lambda_2} = C_g - \rho_1 T - \rho_2 A - \rho_3 B = 0 \dots\dots\dots 17$$

Given the above first order equations, the following structural equations were derived, therefore, from a simultaneous solution as follows;

$$I_g = (1 - \rho_1)\phi_1 I_g^* + (1 - \rho_1)\phi_2 C_g^* + (1 - \rho_1)[1 - (1 - \rho_1)\phi_1 - \rho_1\phi_2]T^* + [(1 - \rho_2) - (1 - \rho_1)(1 - \rho_3)\phi_1 - (1 - \rho_1)\rho_2\phi_2]A + [(1 - \rho_3)(1 - \rho_1)(1 - \rho_3)\phi_1 - (1 - \rho_1)\rho_3\phi_2]B \dots\dots\dots 18$$

$$C_g = \rho_1\phi_1 I_g^* + \rho_1\phi_2 C_g^* + \rho_1[1 - (1 - \rho_1)\phi_1 - \rho_1\phi_2]T^* + [\rho_2 - \rho_1(1 - \rho_2)\phi_1 - \rho_1\rho_2\phi_2]A + [\rho_3 - \rho_1(1 - \rho_3)\phi_1 - \rho_1\rho_3\phi_2]B \dots\dots\dots 19$$

$$T = \phi_1 I_g^* + \phi_2 C_g^* + [1 - (1 - \rho_1)\phi_1 - \rho_1\phi_2]T^* - [(1 - \rho_2)\phi_1 + \rho_2\phi_2]A + [(1 - \rho_3)\phi_1 + \rho_3\phi_2]B \dots\dots\dots 20$$

$$A = \phi_3 I_g^* + \phi_4 C_g^* - [(1 - \rho_1)\phi_3 + \rho_1\phi_4]T + [1 - (1 - \rho_2)\phi_3 - \rho_2\phi_4]A^* - [(1 - \rho_3)\phi_3 + \rho_3\phi_4]B \dots\dots\dots 21$$

$$B = \phi_3 I_g^* + \phi_6 C_g^* - [(1 - \rho_1)\phi_5 + \rho_1\phi_6]T + [(1 - \rho_2)\phi_5 + \rho_2\phi_6]A \dots\dots\dots 22$$

Where

$$\begin{aligned} \phi_1 &= \frac{\alpha_1(1 - \rho_1)}{\varphi_1} & \phi_2 &= \frac{\alpha_2\rho_1}{\varphi_1} & \phi_3 &= \frac{\alpha_1(1 - \rho_2)}{\varphi_2} \\ \phi_4 &= \frac{\alpha_2\rho_2}{\varphi_2} & \phi_5 &= \frac{\alpha_1(1 - \rho_3)}{\varphi_3} & \phi_6 &= \frac{\alpha_2\rho_3}{\varphi_3} \end{aligned}$$

And where; Where;

$$\begin{aligned} \varphi_1 &= \alpha_1(1 - \rho_1)^2 + \alpha_2\rho_1^2 + \alpha_3 & \varphi_2 &= \alpha_1(1 - \rho_2)^2 + \alpha_2\rho_2^2 + \alpha_4 \\ \varphi_3 &= \alpha_1(1 - \rho_3)^2 + \alpha_2\rho_3^2 + \alpha_5 \end{aligned}$$

Solving the structural equations from 18-22 resulted in to the following reduced-form equations, where each endogenous variable is expressed in terms of the exogenous variables represented by the target variable. Accordingly;

$$I_g = \theta_1 I_g^* + \theta_2 C_g^* + \theta_3 T^* + \theta_4 A^* \dots\dots\dots 23$$

$$C_g = \theta_5 I_g^* + \theta_6 C_g^* + \theta_7 T^* + \theta_8 A^* \dots\dots\dots 24$$

$$T = \theta_9 I_g^* + \theta_{10} C_g^* + \theta_{11} T^* + \theta_{12} A^* \dots\dots\dots 25$$

$$A = \theta_{13} I_g^* + \theta_{14} C_g^* + \theta_{15} T^* + \theta_{16} A^* \dots\dots\dots 26$$

$$B = \theta_{17} I_g^* + \theta_{18} C_g^* + \theta_{19} T^* + \theta_{20} A^* \dots\dots\dots 27$$

Where the θ s are combinations of ρ s from equation 7 and α s from the utility function written in (6)

The composition of those coefficients is presented in the annex. And from the estimation of each θ we could deduce the total impact of aid on the exogenous fiscal variables.

4.3 Estimation Technique

One of the constraints of the fiscal response model is how to obtain the target variables. These targets are not generally published and it is difficult to get them from official sources. In view of this problem, thus, the established practice in previous empirical studies is to approximate the targets through various estimation techniques. Before estimating a series of regression equations, therefore, the first step is to estimate the target for Recurrent Expenditure (C_g), Capital Expenditure (I_g), and taxation and other recurrent revenue (T). To obtain the target variables, the usual practice in the fiscal response literature is to regress the value of the actual variables on a vector of exogenous regressors, and use the fitted values as approximations of the targets. However, there is no consensus on what type of variable should be used as a regressor. Different studies, therefore, have used different proxies to get the fitted values (see, Heller, 1975; McGillivray and Ouattara, 2005; Camara, 2004).

This study adopted the approach used by Heller (1975) and Mosley *et al.* (1987) to choose exogenous variables. It is assumed, therefore, that the target value for Recurrent Expenditure I_g^* is related positively to the level of output in the economy in the previous period and negatively to the private sector investment. The usual argument is that the target value of government Investment I_g^* is derived from a target rate of growth of the economy; and public investment is planned to supply the 'residual' needed to drive the actual growth rate up to its target level. It is also considered that the government invests more at the time when there is weak participation in the economy by the private sector, a substitution for private investment (Mosley *et al.*, 1987).⁵¹ On the other hand, the target value of Recurrent Expenditure C_g^* was derived from a linear regression on its value in the previous year. The rationale is that, as argued in much of the literature of the fiscal response model, large share of the recurrent expenditure is accounted for civil consumption expenditures, which are fundamental and continuous activities in the budget

⁵¹ It is also argued, however, that private and public investment would have positive relationship, especially when the latter spurs positive externality in the economy so that economic infrastructures become encouraging for the former. In this case they would be complement.

process. The government, therefore, sets the targets for this year based on the expenditure experience in last year

The target level of tax revenue T^* is derived from estimates of the two main bases for taxation, namely total monetary income and overseas trade in the form of import and export. However, in the case of Ethiopia the trade policy is towards encouraging export, and it is expected that tax from this sector has little contribution to government revenue. Rather, tax from import of goods and services accounts for the largest share of tax revenue. It is believed, therefore, that the government's expenditure program substantially affects the level and composition of imports in a given period.

Furthermore, the target for foreign aid is set equal to the commitment value. This is also a common practice in the fiscal response literature (McGillivray and Ouattara, 2003). The rationale behind this approach is that recipient governments bargain based on the commitments made by donors. During the bargaining process between donors and the government, it is believed therefore that, the latter would try to convince the former to release the amount of aid committed. It is commonly argued that overshooting the target is unlikely, as this would imply that the government could spend more money than it has been allocated. It is also assumed that government will not undershoot this target, as donors may not release the full amount of these commitments. What is generally accepted, therefore, is that governments would rationally attempt to get all commitments to be disbursed (Camara, 2004).

Finally, it is assumed that, *ex ante*, the borrowing target is equal to zero. Similarly, it is considered in this study that the Ethiopian government does not target for domestic borrowing; rather it strives to avoid it and use borrowing as the last resort for deficit financing.

Accordingly, the value of target variables were obtained from the following regression equations and an autoregressive dynamic model (ARDM) was used to estimate the equations.

$I_{gt}^* = 0.67Y_{t-1} - 0.53I_{pt}$	28
(0.08) (0.09)	
$C_{gt}^* = 0.84C_{gt-1}$	29
(0.05)	
$T_t^* = 0.66Y_t + 1.03M_{t-1}$	30
(0.09) (0.06)	

Where Y is GDP, I_p is private investment, M is import; the subscript shows time period, both current and lagged by 1 year; and the values in the parentheses show the standard errors.

Once the values of the target variables were estimated, the next step was the estimation of the structural and reduced form equations. The structural equations, as commonly done in the fiscal response literature, were estimated using the Non-Linear Three Stage Least Squares (NL3SLS) method. As argued in much of the literature, see also Franco-Rodriguez *et al.*,(1998) and Camara(2004), this method is appropriate given that the system is simultaneous and that it contains cross-equation restrictions with respect to the ρ and ϕ parameters. It is noted, therefore, that NL3SLS technique takes into account these restrictions and provides more efficient estimates using all the information available.

CHAPTER FIVE

ESTIMATION RESULTS AND REGRESSION ANALYSIS

Three different groups of estimations were considered to assess different impacts of foreign aid in the revenue-expenditure process of the Ethiopian government. Results obtained from the estimation of the structural and reduced-form equations are summarized and presented in table 3, 4 and 5.

5.1 Measuring the Allocation of Aid Resource

As can be seen from table 3, the values of the coefficients of the structural equations have the required range and sign. In the case of ρ s, all are within the theoretical range, between 0 and 1, implying that only the available amount of each revenue is dispersed into recurrent and capital expenditures.

Table 8. Estimation of Coefficients of the Structural Equations

Coefficients	Estimates	P-Values
ρ_1	0.705	0.02
ρ_2	0.352	0.009
ρ_3	0.277	0.012
ϕ_1	0.331	0.000
ϕ_1	0.231	0.054
ϕ_2	1.087	0.111
ϕ_3	0.555	0.010
ϕ_4	1.755	0.765
ϕ_5	2.876	0.401
ϕ_6	0.011	0.000

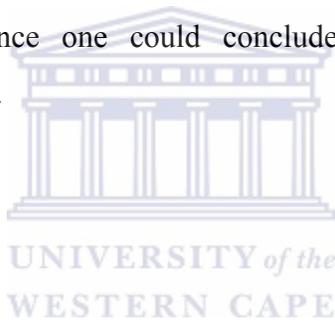
Note: as can be seen from the table all values of the parameters, except for ϕ_4 , are statistically significant and different from zero.

The theoretical model of fiscal response to aid also assumes that each ϕ has a positive sign. Here, although ϕ s do not have direct economic interpretation, they are useful to determine the parameters of the structural equations when combined with ρ s. Thus, from table 3, it is only the values of ρ s that have a direct economic interpretation. The empirical estimation revealed that ρ_1 , ρ_2 and ρ_3 have a value of about 0.71, 0.35 and 0.28 respectively. Based on the theoretical model, the estimation result implies that about 71 percent of tax and non-tax revenue, 35 percent of foreign aid and 28 percent of borrowing are forwarded to government consumption. This implies that the remaining share of each type of revenue goes to capital expenditure.

From the result, while large share of tax and non-tax revenue is used to finance the recurrent expenditure, only a small percentage of the revenue from domestic borrowing is allocated to this type of expenditure. This is small compared to the empirical finding by Franco-Rodriguez *et al.*(1998) in the case of Pakistan and Camara(2004) in the case of Gambia, where about 54 percent and 39 percent of borrowing is used to finance recurrent expenditure activities in the respective countries. This implies, therefore, that Ethiopian authorities use borrowing as a last resort to finance their recurrent expenditure.

Similarly, as opposed to the displacement view that believes each dollar of foreign aid goes to government consumption, the empirical finding in table 3 shows that more than half of the aid inflow is used as a disbursement on capital expenditure, not for consumption expenditure. This doesn't mean, however, that there is no fungibility problem. As already discussed in chapter two, the value of ρ_2 has two different economic interpretations in the fiscal response literature. In the world of Heller (1975) and other similar studies, the 35 percent of aid allocated to recurrent expenditure is considered purely as a measure of aid fungibility in Ethiopia. However, Franco-Rodriguez *et al.* (1998) and most recent studies consider it as an indicator of maximum fungibility. Based on the argument by these studies, therefore, the 35 percent could not be necessarily a measure of aid fungibility in the country, since donors could give some amount of aid to finance certain type of recurrent expenditures.

In this specific study, however, the 35 percent of aid allocated to the recurrent expenditure could be considered as an indicator of fungibility problem in Ethiopia given the following two important conditions. First, Official development Assistance (ODA), as the name implies, is given only for development activities. Accordingly, the Ethiopian government receives aid on condition that it would use the resource for the development of economic and social infrastructures in the country; and donors are interested to give aid only for such activities not for consumption. Accordingly, any positive value for ρ_2 will show fungibility of aid resource. Second, looking at the expenditure account of the government, larger proportion of the recurrent expenditure is on debt servicing and general government services, which again the lion share goes to defense. It is less likely, therefore, that Ethiopian authorities would get foreign assistance to finance their consumption expenditure; hence one could conclude that there is aggregate aid fungibility problem in Ethiopia.



5. 2 Direct Fiscal Impact of Aid Inflow

Taking into account estimations of the parameters of the structural equations, it is possible to tell about the direct incremental impact of foreign aid on different fiscal variables. Table 4 shows how big or small is the effect of a unit increase in aid inflow on different types of revenue and expenditure of the government. The table shows also the direct incremental impact of borrowing on government expenditure and revenue accounts.

Table 9 Direct Incremental Impact of the Compositions of Government Revenue

Impact	Coefficient	Estimated value	P-Values
A on C_g	$[\rho_2 - \rho_1(1 - \rho_2)\phi_1 - \rho_1\rho_2\phi_1]$	0.276	0.000
A on I_g	$[(1 - \rho_2) - (1 - \rho_1)(1 - \rho_2)\phi_1 - (1 - \rho_1)\rho_2\phi_2]$	0.677	0.011
A on T	$-[(1 - \rho_2)\phi_1 + \rho_2\phi_2]$	-0.012	0.006
A on B	$[(1 - \rho_2)\phi_5 + \rho_2\phi_6]$	-0.849	0.001
B on C_g	$[\rho_3 - \rho_1(1 - \rho_3)\phi_1 - \rho_1\rho_3\phi_2]$	-0.026	0.542
B on I_g	$[(1 - \rho_3) - (1 - \rho_1)(1 - \rho_3)\phi_1 - (1 - \rho_1)\rho_3\phi_2]$	0.665	0.097
B on T	$-[(1 - \rho_3)\phi_3 + \rho_1\phi_2]$	-0.098	0.000
B on A	$-[(1 - \rho_3)\phi_3 + \rho_3\phi_4]$	-0.013	0.000
T on A	$-[(1 - \rho_1)\phi_3 + \rho_1\phi_4]$	-0.081	0.072
T on B	$-[(1 - \rho_1)\phi_5 + \rho_1\phi_6]$	-1.631	0.058

The sign and magnitude of the estimated values in table 4 show that foreign aid has bigger positive impact on government capital expenditure and smaller positive effect on recurrent expenditure. The incremental effect shows that an increase in aid disbursement by 100 Ethiopian Birr is associated with an increase of recurrent expenditure and capital expenditure by Birr 28 and 68 respectively. This confirms, although still there is an indication of aggregate aid fungibility, that the Ethiopian government uses larger share of the aid inflow for development purpose. The incremental effect of aid inflow on tax and

borrowing shows that an inflow of 1 Birr in the form of foreign aid is associated with a reduction of tax and borrowing by 1 cent and 85 cents respectively. With respect to borrowing, the result seems to send a message that, in Ethiopia, foreign aid is used as a substitute for domestic borrowing. Similarly, the direction of the association between foreign aid inflow and tax and non-tax revenue seems to conform to the usual argument of the displacement view that aid inflow creates disincentive to raise tax revenue by aid recipient governments. The magnitude of this impact, however, is small enough to support the theoretical argument. Thus, it is better to say, in Ethiopia, taxation effort is not responsive to aid inflow.

Looking at the direct incremental impact of borrowing on government expenditure, the empirical finding in the case of Ethiopia shows that an increase of borrowing by 100 Birr brings about a reduction in recurrent expenditure by 2.6 Birr and increase in capital expenditure by about 67 Birr. This shows the consistency of the estimation result to the findings in table 3; and it confirms that Ethiopian authorities borrow from domestic resources for deficit financing arising from capital expenditure not consumption expenditure. With regards to the impact of borrowing on taxation effort and aid inflow, the result revealed that an increase in domestic borrowing is loosely associated with a reduction in both tax revenue and aid inflow. That is, an increase of borrowing by 100 Birr leads to a reduction of tax and aid inflow only by 9.8 and 1.3 Birr respectively. Similar result was obtained with respect to the incremental impact of taxation on foreign aid inflow. Table 4 shows that an increase of tax and non-tax revenue by 1 Ethiopian Birr is associated with a reduction of aid by 0.08 Birr. The incremental impact, however, is big on borrowing; an increase of tax and non-tax revenue by 1 Birr leads to an increase of borrowing by 1.60 Birr. This shows that every effort to increase tax revenue is offset by a decrease in borrowing.

5.3 Total Fiscal Impact of Aid Inflow

As discussed in detail in the theoretical literature and in the model specification process, the parameters of the structural equations do not show the indirect impact, and therefore total impact, of aid inflow on fiscal variables of the government. Rather the values of

these parameters show only direct and partial effect of aid inflow on the government fiscal behavior. Therefore, it is necessary to take into account the estimated values of the parameters of the reduced-form equations to identify the total fiscal impact of aid inflow in Ethiopia.

As can be seen from table 5, the values of ϕ_4 and ϕ_8 shows that a 1 Birr increase in aid commitment leads to a 0.20 and 0.03 Birr increase in capital and recurrent expenditure respectively. This implies that, in Ethiopia, foreign aid has positive incremental impact on total government expenditure. On the contrary, the same amount of increase in aid commitment results in a reduction of tax and not-tax revenue by 0.09 Birr. Similarly, every inflow of Birr in the form of aid commitment is associated with a reduction of domestic borrowing by an amount equivalent to 0.40 Birr.

Table 10. Estimates of total impact of aid on fiscal aggregates

Impact	Coefficient	Estimated Value	P-Value
A^* on I_g	ϕ_4	0.211	0.009
A^* on C_g	ϕ_8	0.029	0.023
A^* on T	ϕ_{12}	-0.086	0.001
A^* on A	ϕ_{16}	0.853	0.876
A^* on B	ϕ_{20}	-0.403	0.000

Given the empirical results in table 5, two important economic interpretations can be given to the total impact of aid inflow on government fiscal variables. Firstly, the increase in total government expenditure on one hand and a reduction in government tax and non-tax revenue on the other hand will lead to a reduction in government saving. The estimation result on the total fiscal impact of aid inflow in Ethiopia, therefore, seems to send an important message that foreign aid has a crowding-out effect on public saving. However, the reducing total impact of aid inflow on tax and borrowing shows that, ceteris paribus, aid inflow has a crowding-in effect on private saving. This is because a reduction in tax rate means an increase in the level of disposable income, and this would increase the saving rate of consumers and business firms. Similarly, a decrease in domestic

borrowing by the government would lead to an increase in the availability of finance in the credit market so that the private sector would get enough borrowing, this would increase private investment, hence saving. As a result of these different effects of aid on private and public saving, it is difficult to tell in precision about the total impact of aid on aggregate domestic saving in Ethiopia. However, at this level, it is clear that the result doesn't support the displacement view that aid always supplants domestic saving. The conclusion on the aid-saving nexus depends on the dominance of either of the effects of aid. If the increasing effect of aid on private saving is greater than its decreasing effect on public saving, the net effect will be an increase in total domestic saving; otherwise domestic saving will be crowded-out.

With regards to the impact of aid commitment on actual disbursement of the resource, the evidence shows that around 85% of aid commitments to Ethiopia were disbursed. This seems the case that Ethiopia authorities are good at insisting donors to release the amount of aid they promise to give to the government. This result also sends an important message with respect to the aid absorptive capacity of the country. As opposed to a report by IMF (2005),⁵² the empirical finding in table 5 shows that every increase in aid commitment by donors is associated with a proportional increase in the actual disbursement of aid on governmental expenditures, especially capital expenditure.

⁵² In a cross-country analysis of the impact of aid on fiscal aspects of recipient countries, the International Monetary Fund(IMF) noted that Ethiopia couldn't absorb aid resource ; rather the country took the opportunity to build its foreign exchange reserve(IMF,2005:73)

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Foreign aid is considered as an important source of finance to the very poor countries of the world. There is a big controversy, however, on its effectiveness in bringing economic and social development in recipient countries. Although earlier debates, in the 1960s and 1970s, on the economics of aid were about the goodness or badness of aid per se, recent studies have shifted to the identification of factors that influence aid effectiveness in achieving the intended development goals. In this regard, scores of determinant factors have been mentioned so far in the aid effectiveness literature. Although much of the literature on aid effectiveness give emphasis to factors related to geographical, social and political issues; this study has focused on the fiscal impact of aid.

To assess the impact of aid on public fiscal behavior in Ethiopia, thus, the paper used a time series analysis based on a data covering 1975-2005. A theoretical fiscal response model was specified to lay the ground for empirical estimation. The model captured the concept of utility maximization by the government from its expenditures given the budget constraint in the form of foreign aid, tax and non-tax revenue and domestic borrowing. Aid was considered as one of the endogenous fiscal variables that the government has decision power on actual disbursement. Afterwards, structural and reduced-form equations were derived using the theoretical fiscal response model; and NL3SL was employed to estimate the parameters of the two sets of equations.

As a result, three different sets of parameters were estimated. The first belongs to those which show the share of each revenue source that goes to recurrent and capital expenditure accounts of the government. Under the study period, the result revealed that tax and non-tax revenue is the most important source of recurrent expenditure followed by foreign aid and borrowing. That is, while about 71 percent of tax and non-tax revenue is used to finance recurrent expenditure, only 35 and 27 percent of aid and borrowing, respectively, used to finance the recurrent expenditure.

The other sets of parameters were those showing the direct incremental and therefore partial, impact of aid on the different fiscal variables. The values of the parameters show that foreign aid has positive incremental effect both on recurrent and capital expenditure; but the marginal increment is much bigger on the latter. The direct incremental effects of aid on borrowing and tax and non-tax revenues, however, are negative; with stronger effect on the latter. The estimation result revealed that borrowing has strong incremental effect on capital expenditure and weaker negative effect on recurrent expenditure. It was also discovered that an effort on raising tax and non-tax revenue by 1 Birr results in a reduction of domestic borrowing by 1.60 Birr.

The third group of estimated parameters represents the total, both direct and indirect, impact of foreign aid on government expenditure and revenue. Consistent with the partial impacts, the total impact shows that aid has a positive incremental effect on both forms of government expenditure, hence on total expenditure. Similarly, the total incremental impact on the two forms of revenue was also consistent with the direct impact. Therefore, the empirical finding on fiscal impact of aid in the case of Ethiopia can be generalized as: (1) aid is pro government investment, but with little aggregate fungibility; (2) aid has positive impact on total government expenditure; but has weaker decreasing effect on taxation; (3) aid seems to crowd-out public saving, but crowd-in private saving ; (4) aid and borrowing can be considered as an alternative source of finance; hence (5) aid has a significant fiscal impact in Ethiopia.

6.2 Recommendation

Compared to the argument by the displacement view and many other empirical findings, the result obtained in Ethiopia is encouraging : i) almost two-third of the aid resource is allocated to capital expenditure; ii) aid has weaker negative effect on taxation effort; and iii) it discourages domestic borrowing by the government. Therefore, development activities would be undertaken more effectively if donors increase the amount of aid released. As discussed in chapter three, aid inflow in Ethiopia is marked by volatility, and the government is uncertain whether donors will respect their promise or not. This will have a negative effect on development plans and aid management. Thus, donors should be reliable partners to the government and their assistance has to be

consistent so that the government able to manage the budget process. However, equally important, the government also has to reduce its reliance on aid as a source of revenue by building a capacity to raise its own revenue so that it will have strong resource base and will not face financial problem if aid inflow stop.

With respect to future studies, it would be important if future researches replicate the methodology used in this study on disaggregated data. If any mechanism to overcome the problem of data availability , it would also interesting to assess the fiscal impact of disaggregated aid, such as in to its loan and grant components ; and other forms of aid , such as project aid and programme aid. Similarly, considering a more detailed and disaggregated data on public expenditure and revenue would also shed more light on the understanding of how policy makers make their public sector decisions given aid inflow.



REFERENCES

- Adam, C.S. and O'Connell, S.A (1999) Aid, Taxation and Development in Sub-Saharan Africa; *Economics and Politics*, Vol. 11, No.4, pp. 225-253.
- Alesina, A. and Dollar, D. (2000) Who Gives Foreign Aid to Whom and Why? *Journal of Economic Growth* Vol.5, No. 3, pp.33-63.
- Bauer, P. T. (1971) Dissent on Development: Studies and Debates in Development Economics; London, Weidenfeld and Nicolson
- Binh,, T.N. and M. McGillivray (1993) 'Foreign Aid, Taxes, and Public Investment: A Comment', *Journal of Development Economics*, Vol. 41, No.1, pp.173–6.
- Boone, P. (1996) Politics and the Effectiveness of Foreign Aid; *European Economic Review*, Vol. 40, pp. 289-328.
- Burnside, C. and Dollar, D. (2000) Aid, Policies, and Growth; *American Economic Review*, Vol. 90, No.4, pp. 847-869.
- CABRI (2005) Managing Complexity: From Fragmentation to Co-ordination, Budget Reform Seminar, 30 November-2 December, Maputo
- Camara.M(2004)The Impact of Programme versus Project Aid on Fiscal Behavior in The Gambia “ Implications for Aid Flows Supporting the PRSP”, Unpublished Masters thesis, The Netherlands, Institute of Social Studies.
- Chenery, H.B. and Strout, A.M. (1966) Foreign Assistance and Economic Development; *American Economic Review*, Vol. 56, No.4, pp.23-79
- Collier, P. and Dehn, J. (2001) Aid, Shocks, and Growth; *Policy Research Working Paper*, No. 2688, World Bank, Washington
- Dalgaard, C-J; Hansen, H and Tarp, F (2004) On the Empirics of Foreign Aid and Growth; *The Economic Journal*, 114, No.5, pp.191-216
- Djankov, S., Montalvo, J. and Reynal-Querol, M. (2005) Does Foreign aid help? *Cato Journal*, Vol. 26, No.1, pp.1-28
- Devarajan S. A.S. Rajkumar and V. Swaroop. (1998)What does aid to Africa finance? AERC/ODC project on Managing a Smooth Transition from Aid Dependence in Africa, Washington, D.C.
- Devarajan, S. and Swaroop, V. (1998) The Implications of Foreign Aid Fungibility for Development Assistance. Development Research Group, World Bank.
- Franco-Rodriguez, S., M. McGillivray and O. Morrissey (1998) Aid and the Public Sector in Pakistan: Evidence with Endogenous Aid; *World Development Review*, Vol.26, pp.1241–50.
- Feyzioglu, T., V. Swaroop and M. Zhu (1998) A Panel Data Analysis of the Fungibility of Foreign Aid; *World Bank Economic Review*, 12 (1): 29–58.
- Friedman, M. (1958) Foreign Economic Aid; *Yale Review*, Vol. 47, No.4, pp. 501-516.
- Furtado, X. and Smith, W. (2007) Ethiopia: Aid Ownership and Sovereignty; *Global Economic Governance Working paper* , No.07/28 .pp 1-45.
- Gang, I. and H.A. Khan (1991) Foreign Aid, Taxes and Public Investment; *Journal of Development Economics*, Vol. 34, No.1,pp. 355–69.
- Geda, A. (2002) Macroeconomic Performance in Post-Reform Ethiopia; *Journal of Northeast African Studies*, Vol. 7 ,No. 2, pp 1-67

- Geda, A. and Degefe, B. (1998) Managing Transition from Aid Dependence in Ethiopia, Paper presented at the Workshop on Managing Transition from Aid in Africa, 03-04 December, Nairobi, Kenya
- Geda, A. and Degefe, B. (2005) Explaining African Growth Performance: Explaining African Economic Growth Project: The Case of Ethiopia; *African Economic Research Consortium (AERC) research paper*, No 26/2005.
- Griffin, K. (1970) Foreign Capital: A Reply to Some Critics; *Bulletin of the Oxford University Institute of Economics and Statistics*, Vol. 32, No. 2, pp. 156-161.
- Griffin, K. and Enos, J. L (1970) Foreign Assistance: Objectives and Consequences; *Economic Development and Cultural Change* , Vol.18, No. 3, pp.313-27.
- Gupta, K. (1993) Sectoral Fungibility of Foreign Aid in India; mimeo, University of Alberta.
- Gupta,S., Clements,B., Pivovarsky,A. and Tiongson.E.R(2003) Foreign Aid and Revenue Response: Does the Composition of Aid Matter? *IMF working paper*, No.3 ,pp 3-27
- Healey J.M. (1971) *The Economics of Aid*; London, Routledge and Kegan poul ltd
- Heller, P.S. (1975). A Model of Public Fiscal Behavior in Developing Countries: Aid, Investment, and Taxation. *American Economic Review*, Vol. 65, No.3,pp.429-45.
- IMF (2005) The Macroeconomics of Managing aid inflows: Experiences of low-income countries and policy implications: IMF Policy Development and Review Department, August 2005.
- Khilji, N. and E. Zampelli (1994) The Fungibility of US Military and Non-military Assistance and the Impacts on Expenditures of Major Aid Recipients; *Journal of Development Economics*, Vol. 43, pp.345–62.
- Maizels, A. and Nissanke, M. (1984) Motivations for Aid to Developing Countries; *World Development*, Vol.12, No.9, pp.879-900.
- McGillivray, M. (1994) The Impact of Foreign Aid on the Fiscal Behavior of Asian LDC Governments: A Comment on Khan and Hoshino (1992); *World Development*, Vol. 22, No.12, pp. 2015–7.
- McGillivray, M. (2000) Aid and Public Sector Behavior in Developing Countries; *Review of Development Economics*, Vol.4 , No.2, pp. 156–63.
- McGillivray, M. and O. Morrissey (eds) (1999) *Evaluating Economic Liberalization* London: Macmillan.
- McGillivray, M. and O. Morrissey (2001) *Fiscal Effects of Aid*, Helsinki: World Institute for Development Economics Research; *WIDER Discussion Paper* , No.61, pp.2-54
- McGillivray, M. and Ouattara, B. (2003). *Aid, Debt Burden and Government Fiscal Behavior in Cote d'Ivoire*; Centre for Research in Economic Development and International Trade (CREDIT), University of Nottingham.
- MOFED (2005) Ethiopian Budget Proclamation; No.05/ 205, Addis Ababa
- MOFED (various years) Data set; *Negarit Gazeta*, 1974-2003, Addis Ababa
- Mosley, P., J. Hudson and S. Horrell (1987) Aid, the Public Sector and the Market in Less Developed Countries; *Economic Journal*, Vol.97, No.387, pp.616–41.
- Njeru (2003) The Impact of foreign aid on public expenditure: The case of Kenya; *Moi University; AERC Research Paper*,No.135.

- Pack, H. and J.R. Pack (1990) Is Foreign Aid Fungible? The Case of Indonesia; *Economic Journal*, Vol.100, pp.188–94.
- Pack, H. and J.R. Pack (1993) Foreign Aid and the Question of Fungibility; *Review of Economics and Statistics*, Vol.75, pp.258–65.
- Rahman, M.A. (1968) Foreign Capital and Domestic Savings: A Test of Haavelmo's Hypothesis with Cross-Country Data", *Review of Economics and Statistics*, Vol. 50, No.1, pp.413-426
- Reddy, S. and Minoiu, C. (2006) Development Aid and Economic Growth: A Positive Long-Run Relation; *DESA Working Paper*; No. 29, Columbia University, New York.
- Remmer, K (2004) Does Foreign Aid Promote the Expansion of Government? *American Journal of Political Science*, Vol.48, No.1, pp. 77-92
- Rosenstein- Rodan, P.N. (1961) International aid for underdeveloped countries; *Review of Economics and Statistics*, Vol.43, No.2, pp 123-176
- Rostow, W.W. (1963) *The Economics of take-off in to Sustained Growth*; London, Macmillan Printing Press.
- Rubinson, R. (1977) Dependence, Government Revenue, and Economic Growth, 1955-1970: Cross-national Analysis; *American Sociological Review*, No. 42, pp. 611-23.
- Swaroop, V., Jha Shikha and Rajkumar, A.S. (2000) Fiscal effects of foreign aid in federal system of governance: The case of India; *Journal of Public Economics*, Vol. 77, No. 20, pp. 307–330.
- World Development Indicators (Various years) WORLD BANK [CD-ROM] The World Bank, Washington, DC
- Weiskopf, T. (1972) The Impact of Foreign capital Inflow on Domestic Savings in Underdeveloped Countries; *Journal of International Economics*, No.21
- White, H. (1992) The Macroeconomic Impact of Development Aid: A Critical Survey; *Journal of Development Studies*, Vol. 28, No. 2, pp. 163-240
- White, H (1994) Foreign Aid, Taxes and Public Investment: A Further Comment; *Journal of Development Economics*, Vol. 45, pp.155-163.
- White, H. (1998) Aid and Macroeconomic performance theory: Empirical evidence and four country cases; New York :st. martin's press
- Wilkes, J. (2001). Programme Aid: What do we need to learn? *Background Paper* Evaluation Department (EvD) of the DFID.
- World Bank (1998) *Assessing Aid: What Works, What Doesn't, and Why*; New York, Oxford University Press.
- World Bank (2004) *Ethiopia Public Expenditure Review, the emerging challenge: Medium-Term Trends and Recent Developments in Public Spending*, Country Department for Ethiopia, Report No. 29338-ET

Internet Source

More definitions on foreign aid are available online at ;
www.iie.com/publications/chapters_preview/321/1iie2911.pdf and
www.academicdb.com/ is true definition foreign aid 18776/

Information on DAC is available online at;

www.oecd.org/department/0,2688,en_2649_34447_1_1_1_1_1,00.html

DAC's Official definition on aid is available at;

<http://stats.oecd.org/glossary/detail.asp?ID=1891>

Definition on budget support is available at;

http://www.transparency.org/global_priorities/aid_corruption/corruption_aid/budget_support_programme_aid

More information on Ethiopia, Country profile, is available at;

<http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/ETHIOPIAEXTN/0,menuPK:295939~pagePK:141132~piPK:141107~theSitePK:295930,00.html>

The data from Penn World Table 6.1(PWT 6.1) is available online at;

<http://www.bized.co.uk/dataserv/penndata/pennhome.htm>



Appendices

Appendix A. First order equation from the maximization of the utility function

$$\frac{\partial L}{\partial I_g} = -\alpha_1(I_g - I_g^*) + \lambda_1 = 0 \dots\dots\dots 1$$

$$\frac{\partial L}{\partial C_g} = -\alpha_2(C_g - C_g^*) + \lambda_1 + \lambda_2 = 0 \dots\dots\dots 2$$

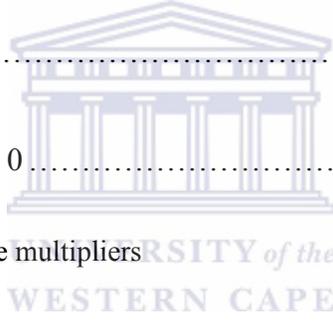
$$\frac{\partial L}{\partial T} = -\alpha_3(T - T^*) - \lambda_1 - \lambda_2 \rho_1 = 0 \dots\dots\dots 3$$

$$\frac{\partial L}{\partial A} = -\alpha_4(A - A^*) - \lambda_1 - \lambda_2 \rho_2 = 0 \dots\dots\dots 4$$

$$\frac{\partial L}{\partial B} = -\alpha_5(B - B^*) - \lambda_1 - \lambda_2 \rho_2 = 0 \dots\dots\dots 5$$

$$\frac{\partial L}{\partial \lambda_1} = I_g + C_g - T - A - B = 0 \dots\dots\dots 6$$

$$\frac{\partial L}{\partial \lambda_2} = C_g - \rho_1 T - \rho_2 A - \rho_3 B = 0 \dots\dots\dots 7$$



Where λ_1 and λ_2 are the Lagrange multipliers

Appendix B. Estimation of parameters measuring total fiscal impact of aid inflow

$$\theta_1 = \left[\frac{1 - \rho_3}{\alpha_1(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_2 = \left[\frac{\chi_3 - \rho_2}{\alpha_1(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_3 = \left[\frac{\chi_3 - \rho_1 \chi_2}{\alpha_1(\chi_1 \chi_2 - \chi_2^2)} \right]$$

$$\theta_4 = \left[\frac{\chi_3 - \rho_2 \chi_2}{\alpha_1(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_5 = \left[\frac{\chi_3 - \rho_3 \chi_2}{\alpha_1(\chi_1 \chi_2 - \chi_2^2)} \right] \quad \theta_6 = \left[1 - \frac{(\chi_3 - \rho_2) + (\chi_1 - \rho_2)}{\alpha_2(\chi_1 \chi_3 - \chi_2^2)} \right]$$

$$\theta_7 = \left[\frac{(\chi_3 - \rho_2) + \rho_1(\chi_1 - \chi_2)}{\alpha_2(\chi_1 \chi_3 - \chi_2^2)} \right]$$

$$\theta_8 = \left[\frac{(\chi_3 - \chi_2) + \rho_2(\chi_1 - \chi_2)}{\alpha_2(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_9 = \left[\frac{\chi_3 - \rho_1 \chi_2}{\alpha_3(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_{10} = \left[\frac{(\chi_3 - \chi_1 \rho_2)}{\alpha_3(\chi_1 \chi_3 - \chi_2^2)} \right]$$

$$\theta_{11} = \left[1 - \frac{(\chi_3 - \chi_1 \rho_2) + \rho_1(\chi_1 \rho_1 - \chi_2)}{\alpha_1(\chi_1 \chi_3 - \chi_2^2)} \right]$$

$$\theta_{12} = \left[\frac{(\chi_3 - \rho_3 \chi_2) + \rho_2(\rho_1 \chi_1 - \chi_2)}{\alpha_3(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_{13} = \left[\frac{\chi_3 - \rho_2 \chi_2}{\alpha_4(\chi_1 \chi_3 - \chi_2^2)} \right]$$

$$\theta_{14} = \left[\frac{(\chi_3 - \chi_2 \rho_2) + (\rho_2 \chi_1 - \chi_2)}{\alpha_4(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_{15} = - \left[\frac{(\chi_3 - \chi_2 \rho_2) + \rho_1(\rho_2 \chi_1 - \chi_2)}{\alpha_4(\chi_1 \chi_3 - \chi_2^2)} \right]$$

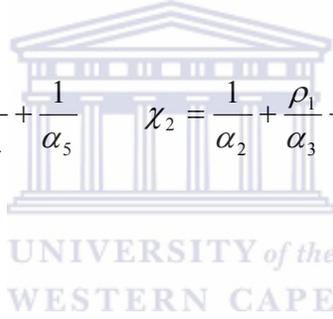
$$\theta_{16} = \left[\frac{1 - (\chi_1 - \rho_2 \chi_2) + \rho_2(\rho_2 \chi_1 - \chi_2)}{\alpha_4(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_{17} = \left[\frac{(\chi_3 - \rho_3 \chi_2)}{\alpha_5(\chi_1 \chi_3 - \chi_2^2)} \right]$$

$$\theta_{18} = \left[\frac{(\chi_3 - \rho_3 \chi_2) + (\chi_3 \rho_1 - \chi_2)}{\alpha_5(\chi_1 \chi_3 - \chi_2^2)} \right] \quad \theta_{19} = \left[\frac{(\chi_3 - \rho_3 \chi_2) + \rho_1(\rho_3 \chi_1 - \chi_2)}{\alpha_5(\chi_1 \chi_3 - \chi_2^2)} \right]$$

$$\theta_{20} = - \left[\frac{(\chi_3 - \rho_3 \chi_2) + \rho_2(\rho_3 \chi_1 - \chi_2)}{\alpha_5(\chi_1 \chi_2 - \chi_2^2)} \right]$$

Where $\chi_1 = \frac{1}{\alpha_1} + \frac{1}{\alpha_2} + \frac{1}{\alpha_3} + \frac{1}{\alpha_4} + \frac{1}{\alpha_5}$ $\chi_2 = \frac{1}{\alpha_2} + \frac{\rho_1}{\alpha_3} + \frac{\rho_2}{\alpha_4} + \frac{\rho_3}{\alpha_5}$ and

$$\chi_3 = \frac{1}{\alpha_2} + \frac{\rho_1^2}{\alpha_3} + \frac{\rho_2^2}{\alpha_4} + \frac{\rho_3^2}{\alpha_5}$$





UNIVERSITY *of the*
WESTERN CAPE