THE RELATIVE ROLE OF FOREIGN AID AND DOMESTIC RESOURCE MOBILIZATIONS AS A STRATEGY TO BOOST ECONOMIC GROWTH OF DEVELOPING COUNTRIES: THE CASE OF ETHIOPIA

By

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Abstract

This thesis tried to examine the relative role of aid and domestic resources in boosting economic growth of developing countries with particular reference to Ethiopia. There are wide empirical debates on effectiveness of large aid flows, particularly, to low income countries related to inefficient allocation and vulnerability to corrupt uses, and sustainability. It was noted that volume of savings in developing countries was too low on account of low income and it has been justified that domestic saving should be supplemented by foreign resources. Ethiopia has been among top aid receiving countries that accounts about 14% of Gross National Product (GNP) in foreign aid in recent years. It has been much greater than total domestic savings, while flow of foreign private capital is very low.

This study used both descriptive and econometric analysis in two parts. The econometric analysis is based on annual data that extends from 1970 to 2011 on real per-capita GDP, aid, domestic savings, human capital and other relevant variables. The test and estimation of level (long-run) relationships between economic growth, domestic saving and aid is made with Auto Regressive Distributed Lag (ARDL) co-integration techniques of Pesaran and Shin (1998), and Pesaran *et.al* (1999, 2001).

Domestic resource mobilizations from private savings, and tax collection effort had often been weak and somewhat stagnant through time, except for the last two years. The result shows strong positive effects of aid and domestic savings on economic growth in long-run. The domestic resource mobilization has higher positive impact on growth than aid. Coefficient estimate for aid turns negative, though statistically insignificant, in growth equation when investment level is explicitly controlled. This further confirms some presence of absorptive capacity constraints associated with spending large aid money.

Moreover, the short run effect of aid on growth is negative while that of domestic saving is positive but insignificant.

It is suggested to diversify investment sources into more FDI, domestic capital market developments and better management and coordination of aid efforts to reap from benefits of various investment activities. Such efforts require building stronger institutional rules, human capacity and specific incentive instruments for mobilizing resources from domestic and foreign private sectors. Further researches can focus on the determinants of domestic savings and flows of FDI.

CHAPTER 1: INTRODUCTION

1.1. Background of the study

This paper analyzed the relative role of foreign aid and domestic resource mobilizations in boosting economic growth of Ethiopia using quantitative estimation methods.

Ethiopia has been one of the fastest growing economies in Africa since the last 8 years starting from 2004, witnessing average annual real GDP growth rate of 11.4 % till the year 2010/11 (MoFED, 2011, African Economic Outlook, 2011). Although growth remains still strong as of 2011, Ethiopia is facing challenges from socio-economic instability and macroeconomic management problems. High poverty rate, low human development, high unemployment and political instability have long been problems to Ethiopia. Head count poverty rate still stands at 32.3% in 2009/10 (African Economic Outlook, 2011). The UN Development Assistance Framework (UNDP, 2011) reported that the pressures of poverty and lack of employment opportunities are provoking a "huge increase in migration in and from Ethiopia, in particular by the youth." Besides these basic development challenges, short-run macroeconomic management difficulties are widely observed associated with rising level of inflation (African Economic Outlook, 2011).

The macroeconomic challenges of high inflation, large budget deficit in turn can have perverse effects on long run growth, mainly through its effect on real interest rate. Higher

inflation than nominal interest rate means that the real rate of return on private savings is negative which can have undesired consequences on rate of national savings. Savings, will be discouraged, which would theoretically can promote inefficient allocation of resources away from productive investments towards holding unproductive speculative assets, thus ultimately lowering growth potential of economy.

The country is currently facing very high and rising inflation rate since 2004/05 and running high expansionary fiscal activities. Despite the government's effort to contain inflation below 10%, through use of monetary policy tools, it has been on escalating move by a double digit since 2003/04, and become intense since 2007/08, reaching its highest level of 36.4% in 2008/09. Lower domestic resource mobilizations still remain the main challenges despite the government's tight monetary and careful fiscal policies that were aimed to boost domestic revenue and lower domestic borrowings (MoFED, 2011).

Tax, of different forms, constitutes the main source of public revenue in Ethiopia. The tax revenue, for example, accounts for 79% of total government revenue in 2004/05 (MoFED, 2005). However, in spite of a decade long *Tax policy reform* efforts underway with support of IMF, the country's tax revenue performance had been poor throughout time in last 5 years ending 2010/11. According to Ministry of Finance and economic Development of Ethiopia (MoFED) (2011), tax revenue to GDP ratio had been 10.6% in 2006/7; 8.6% in 2008/9; slightly rose to 11.3% in 2009/10 and stood at 11.5% in 2010/11. These figures are still the lowest as compared to other countries of similar economic positions. According to World Bank report (2011), domestic tax revenue in proportion to national income, was one of the lowest as compared with that of average Sub-Sahara

African countries, low income countries and world average tax rate. Tax revenue in Ethiopia has started slightly rising only since 2010/11, after long years of stagnation and sometimes down trends (MoFED, 2011).

Ethiopia has long been reliant on foreign borrowings with low level of domestic resource mobilization rates in addressing the wider socio economic issues. Ethiopia is the second top recipient of net official development assistance (ODA) next to Afghanistan among the 43 fragile states as of 2008 (OECD, 2011). The country for example, received net ODA to GNP inflows of 13.4% in 2009 as compared to the 9.4% for the average low income countries and the 4.9% for Sub-Sahara Africa in the same year (World Bank, 2011).

There is also a growing concern that foreign currency inflow would facilitate a high capital flight through illegal ways, topping up the problem of currency crisis and slowing down economic development. According to a recent report, developing countries had been facing drastically rising illicit financial flow out of their boundaries over the last decade ending 2009, mainly due to increased corruption, kickbacks, and trade mispricing (Global Financial Integrity, 2011).

The importance of foreign aid had been justified on premises of 'financing-gap' model where it is supposed to fill the gap in investment need and domestic savings, demand for imported goods, or human skill training needs of developing countries in the short run. The long run effectiveness of foreign aid would depend on the extent to which overall resources are used for further productive uses (Were, 2001)

Existing literature stressed the policy challenges associated with huge flows of official development assistances as well as the efficient management of funds flowing from diversified sources in to low income countries. As pointed out by Montel (2003), the challenges faced by aid recipient countries include: the inefficient uses of borrowings, weak management of resources, possible undesired macroeconomic consequences of capital inflow and importantly, challenges of mitigating its vulnerability to illicit capital flight and financial crises.

There is also a growing concern on effectiveness of foreign aid, due to the existing complex architecture of aid delivery, fragility, and low human capacity of recipient governments to plan and coordinate the different sources of aid so as to reduce wasteful duplication of efforts (Kharas, 2007).

Besides domestic fiscal difficulties, mainly poor tax administration, Ethiopia has been implementing the often quoted 'ambitious' Growth and Transformation Plan (GTP) (2010 -2015) that is "geared towards fostering broad-based development in a sustainable manner to achieve the MDGs" (World Bank, 2013), by aiming to double the national income within five years ending 2015. The plan envisions high annual real GDP growth of 11.2 % (medium growth scenario) or 14.9 percentages (high scenario) to achieve a goal of doubling the real GDP by the end of 2014/15 and becoming middle income country by 2022/3. The base line income growth, macroeconomic conditions, and resource allocations were based on the achievements in five years of predecessor program named '*Plan for Accelerated and Sustained Development to End Poverty*' (PASDEP) during (2005/6-2009/10). There is a desperate need of financing the required large

investments. The estimated amounts of required annual financial resource flows are specified in terms of average growth rates of each variable in each growth case scenarios. Under base and high growth scenarios adopted, the economy is projected to grow under certain required rates of growth in investment, government expenditures, inflow of foreign savings and domestic household savings (MoFED, 2010).

Issues of high aid dependence, sustainability, and possible perverse macroeconomic challenges need close scrutiny to find way out through effective mobilization of domestic resources in the development activities. Empirically understanding the extent to which foreign aid impacts on Economic Growth and its relative significance as compared to alternative domestic resource mobilizations is very important for informed decision making.

1.2. Statement of the Problem

Aid is only one part of the resources that need to be mobilized in the development effort of low income countries. The increased reliance on domestic financial and all available resources should be the way out for self- sustained growth and prosperity. The possible sources of growth driving formulations are increased government revenues, foreign direct investment, domestic saving mobilizations and remittances.

It is becoming common understanding that there is a need to go beyond aid in fragile and highly aid dependent countries to harness the full range of resource flows to take advantage of their potential contributions to development results. Most of the economies

in LDCs do not efficiently mobilize their domestic financial resources. According to Walle (2008), Sub-Saharan Africa (SSA) countries are still receiving large development assistances that exceed foreign private capital inflows. The study found that it was due to less developed banking and other financial institutions. Commercial banks, insurance companies and microfinance institutions (MFIs) are the few dominant in mobilizing resources in most African countries including Ethiopia.

Ethiopia was among the seven countries selected in the UN Millennium Project (2005) to develop large investment plans for MDG achievements (UNDAF Country Team for Ethiopia, 2011). The large infrastructure and industry development projects which were initiated under the "*Growth and Transformation Plan*" (2010-2015) are the biggest of their kinds ever commenced in the country. A lion's share of funds are planned to be raised from foreign sources as well as from domestic issuance of financial instruments (MoFED, 2010). Emphasis to domestic resource mobilization initiatives can be important in promoting self-reliant economic activity which would play key role in determining the sustainability of future developments.

The challenges of high foreign resource inflows are associated with inflationary pressure, weak domestic saving mobilization, less emphasis to private sector developments and postponed reforms of financial institutions.

IMF and World Bank particularly, are questioning the country's ability to achieve steady growth and stable economy due to consequences of high and rising inflation associated

with increased financial injections would exacerbate the macroeconomic instability and possibly "curb down economic growth" (McGregor, 2011).

Regarding sources of financing investments, the plan indicated long term strategy to be adopted for financing growth plan. There is an intention to increase household savings in order to match the targeted growth rate in investment and reduce resource gap by end of the period. There is also clear plan to increase reliance on annual foreign borrowings which are often unpredictable and out of the country's control. Nevertheless, the plan merely puts both options to use as the possible alternatives and encouragement of saving is merely implied in macroeconomic policy objectives. Long-term perspective on domestic resource mobilizations may need to exist that this study is intended to clarify on its relative significance.

However, there appears to be hasty and simple conclusions about the implications of choice of each strategy on income growth or distributions by merely referring to the short run dynamics of reliance on either foreign savings or domestic savings or tax bases (see for example, Engida, et al, 2012).

At this point there should be a clear understanding of how each option is significant in a long term development process. Laying strong institutional basis as well as appropriate policy strategy is necessary not only to pursue the current desperate investment needs, but also to sustain long run economic development that in turn depends on today's choice of financing strategies.

This study tries to answer the following main empirical questions:

➢ What are the nature, compositions, trends and mechanisms of recent aid delivery system in Ethiopia?

➢ What is the relationship between foreign aid and economic growth in Ethiopia?

➢ What is the main channel through which aid contributes to per-capita output growth for the Ethiopian economy?

➢ What are the relative significances of foreign aid and domestic saving in effectively boosting economic growth in long-run?

➢ How is it possible to make better use of large aid to augment domestic resource mobilization capacity without eroding repayment capacity of associated debt?

1.3.   Objectives of the Research

The study is intended to analyze the role and relative contributions of foreign aid and the domestic resource mobilizations in the long-run economic growth process of Ethiopia.

The research tried to address the following specific objectives

➢ To examine the nature, compositions and trends of recent aid, its sector based allocation and delivery system in Ethiopia

➢ To analyze the relative significances of foreign aid and domestic resource mobilizations, particularly, gross domestic saving in effectively boosting economic growth of Ethiopia

➢ To identify the main channel through which aid contributes to per-capita GDP growth

➢ To analyze both long run and short run relationships between foreign aid, domestic savings and economic growth and the possible effect of aid on domestic saving in Ethiopia.

➢ To suggest appropriate policy tools for effective utilization of potential domestic resources through improved aid allocation in growing resource constraints for development goals.

1.4.   Significance of the Study

The study is intended to analyze the role of foreign aid in the economic growth of Ethiopia and makes comparative analysis to the alternative domestic sources of funding developmental investments through mobilization of domestic resources. The study could be used as input by government policy makers in devising strategies for better and efficient utilization of both external and domestic financial resources available to them in the achievement of long term goal as stipulated in Growth and poverty reduction agendas.

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Making an exhaustive analysis of the growth contributions of the different forms of foreign sources of finance and domestic capital resources will help to make appropriate move forward in ensuring better mobilization, allocation, and help resolving some of the side effects associated with use of foreign aid through appropriate macroeconomic management tools.

The study can also contribute to our empirical understandings of aid effectiveness and its role in supporting economic growth of highly aid dependent countries with economic and institutional developments challenges.

1.5. Scope of the study

The study analyzes the role of foreign aid to the economic growth of Ethiopia and makes comparative analysis to the other important domestic sources of funding development activities. To understand how foreign aid affects growth, the channels through which external resources can possibly affect GDP would be explicitly controlled in the general growth model. These variables include investment expenditure, gross domestic savings and level of macroeconomic management variables (trade openness, inflation).

 Foreign aid, domestic savings would be augmented to growth model and fitted using time series econometric techniques.

The time series data from 1970-2011 has been used based on availability of data. This period incorporates the early times when the country begun receiving foreign aid.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

There is very large body of literature on development aid and its impact on growth and poverty reduction effort in recipient countries. The studies developed into wider scopes and different phases. Particularly, the macroeconomic impact of foreign aid had entailed series of debates and policy orientations towards selection of recipients and mechanism of its delivery. Empirical literature had subsequently provided useful policy implications by applying various approaches from methodological perspectives.

This chapter focused on review of wider literature on macroeconomic impact of aid and issues of domestic resource mobilizations, particularly in Ethiopia. The early economic rationale for giving aid and main definitions of development aid and other foreign capital inflows are highlighted. Detailed review of literature on aid, economic growth and public capital formation then follow in some sections.

Proponents of aid claim that achievement of certain desired investment and economic growth targets need to be supplemented with large aid. On the other hand, it is argued that aid entails some macroeconomic challenges in weak institutions which in turn may lead to underdeveloped domestic resource mobilization efforts. The issues of macroeconomic challenges in large foreign capital inflows are subsequently considered. Further analysis on aid effectiveness and recent development efforts in Ethiopia are

provided separately in subsequent sections. The implications for fiscal policy directions towards resource mobilizations are implied in the analysis. Finally, extended conclusion on the reviewed literature is forwarded.

2.1. Basic doctrines and Rationales for giving Aid

The importance of capital in production for the progress of any economy is very clear and it had often been considered as one of main driving source of growth and has long been recognized to explain much of differences in income level of countries.

Recent theoretical researches have recognized difficulty of explaining world development patterns with use of standard one-sector tools of economic analysis. Such analyses had counterfactual implications of convergence in economic growth and income levels of economies due to access to capital and technologies under condition of increased national saving rates (Azariadis, and Drazen, 1990). However, the observed world development patterns were not the case as many developing countries had been falling behind in economic progress. To the contrary was the fast growth experience of many East Asian countries since 1960s, which has attracted new development theories to explain factors accounting for such diverse economic performances (Ray, 1998; Azariadis, 2006).

Unlike the standard factor price equalization theory of international trade or the neoclassical convergence hypothesis of economic theories, there remains a persistent poverty in many of developing countries (Bowles *et al*., 2006). Much development

challenges had been common problems, particularly to most Sub-Saharan African Countries(SSA) despite large foreign official resource inflows for over half a century (Moyo, 2010). To explain such particular disappointing development realities in many low income countries, recent researches in development theories have developed many explanations for the reasons why economies may fail to prosper or left in persistent poverty conditions. The so *called threshold models* of poverty is one of the main explations widely recognized in development literature. It expalins the critical threshold that may arise when large investments are constraints to be on cycle of higher self-enforcing growth and savings paths. The second explanations for persistent poverty is related to weak institutions related to property rights, and bad socio-economic policies as a result of social interactions and political forces (Bowles *et al.*, 2006).

To achieve better economic progress, a continuous improvement in productive capacities has been found very crucial. Financing key development structures had been constraining many poor economies due to insufficient domestic resources mobilization and balance of payments constraints to import capital and intermediate goods.

The gap between required investments and available domestic resources had been one main argument in the *Harrod –Domar* type of the 'financing gap' models widely used in practice by International Financial Institutions (IFIs) such as IMF and World Bank (Easterly, 1997).

In the these type of models, capital requirements for target income growth is calculated based on measure of capital output ratio in economy (ICOR), and compared against likely

availability of savings, and the difference is termed as 'saving- investment gap'. At the same time, projections of import demand and export supply would be made by taking account of all available information on likely need for imported capital and intermediate goods, world market condition, and domestic income. The difference between projected import demand and export is termed as 'trade gap'. From simple national income identity, it would be easy to see that both types of resource gaps are the same at the end. This model was the widely applied framework than any other models in macroeconomic impact of aid literature in the past and its more practical version is still in use by World Bank/IMF (see, Wijinbergen, 1986; Easterly 2004; Ranaweera, 2004).

The basic growth equation behind this *financing gap model* was due to Evsey Domar (1946) and Harrod (1939) which subsequently coined in to well-known concept of 'two-gap' models by the then World Bank economists (White, 1992). This model clearly elaborated that high level of saving and investment were the main driving forces for high economic level through industrialization. Shortage of capital has been considered as the main constraint in growth of developing countries and could be filled by borrowing internationally (White, 1992). Therefore, lack of sufficient domestic financing capacity has been among the main reasons for favoring continuous flow of official resources to fill the 'financing gap' in less developed countries. The use of this framework has been still influential paradigm among international financial institutions and policy makers in policy dialogue on foreign aid (Easterly, 1997; Ranaweera, 2003).

This main argument in the literature of development assistance had dominated the academic and policy making in aid to recipients, particularly those in Sub-Sahara Africa, despite less appealing experiences of these countries in overall economic performances ex-post (Easterly, 2006; Moyo, 2010; Seriex, 2011).

The remaining sections are organized as follows; the definition of concepts related to Official Development Assistance (ODA), its commitments, net flows are higlighted in section 2, followed by review of various macroeconomic aspects of aid effectivess, domestic resource mobilizations and empirical studies on aid –growth relationships.

2.2.   Definition of Concepts in foreign Aid

Studies on role of foreign financial flows to recipient countries are wide and divergent in empirical conclusions partly owing to specification differences and data (Doucouliagos and Paldam, 2008).

As suggested in Harms and Lutz (2004), taking a separate perspective on different types of aid is important to reach informative conclusion from studies that try to identify macroeconomic effects of aid on economic growth. Thus, it is necessary to define various terms used to represent foreign 'aid' or financial inflows; vis-à-vis aid disbursements, external debt, net transfer and official development assistances (ODA) due to varying financial *terms* and economic implications. The failure to clearly identify the concepts may pose difficulty of understanding conclusions in studies.

The tasks and need for defining 'aid' concepts in general is recognized as complex and very important (Sindzingre, 2012). Particularly, quantitative analysis of macro-economic impact of aid is deemed to need a careful identification and use of appropriate data with respect to foreign aid inflows.

I rely on OECD's glossary of statistical terms and external debt statistics of the Inter-Agency Task Force on Finance Statistics (2003)[1] as being adopted in IMF, OECD and World Bank. The concepts are similar to those used for compiling data on international financial transactions by International aid agencies and other institutions.

The 'flows' on external debt or loans are often termed as International financial Flows (IFFs) that occur during certain period of time like a year, and add on to total external debt position of a aid recipient thus forming financial repayment obligations that a receiving country has to make in the future.

Flows of International financial resources from rich to poor countries are further categorized as official flows and non-official (Private) flows. Official flows are flows from a bilateral government or multilateral official agencies to a recipient country. It includes official development assistance (ODA) and other official flows (OOFs), together are often simply termed *foreign aid*. ODA is the sum of loans, grants, and technical assistances provided by developed countries' international development agencies and multilateral donors to developing countries on DAC list of aid recipients to help promote

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[1] Inter-Agency Task Force on Finance Statistics is International Working group on external debt statistics adopted jointly by World Bank, IMF, BIS, Eurostat, Common wealth Secretariat, OECD, Paris Club, UNCTAD (2003)

developments. The flows of official financial assistance need to meet three important criteria to be considered as ODA. First, the flow is from the official sector (bilateral or multilateral agencies); secondly the purpose has to be supporting economic development in recipient countries; and the final criterion is that the resource transfer is at concessional financial terms (contains not less than 25% grant element) (IMF, 2006; and OECD, 2006). Any official flow that do not meet two of the above three criteria either because the flows are not for development purpose or with a less than 25% grant element are considered as other official flows (OOFs). Commercial credits (export credits, and non-ODA loans by governments), military aid are excluded (OECD, 2006).

Other Official Flows (OOFs) on the other hand, are "transactions by the official sector with countries on the List of Aid Recipients which do not meet the conditions for eligibility as Official Development Assistance or Official Aid, either because they are not primarily aimed at development, or because they have a Grant Element of less than 25%" (OECD, 2002).

The second type of 'flows' is the non-official flow- called private flows to recipient country. These include the foreign Direct Investment, and portfolio investments by private investors, private bank loans, short term export- import credits, and charity by NGOs. However, most NGO activities are financed by official donor agencies' regular budgets, and thus, already included into Official Development Assistances.

Gross External debt position of a country is viewed as the 'stocks' of financial resources owed to foreign economy by debtor country at a given time and represents outstanding financial liabilities to recipient economy. It is widely used to manage debt sustainability, cash flows and to judge creditworthiness of borrowers particularly since the debt crisis of 1980s and recent global financial crises (IMF, 2003:1). Some of measurements and monitoring of flows on external debt are those by World Bank in its *Debtors Reporting System* (DRS)*, the Joint IMF- World Bank's Public Sector Debt Statistics (PSD),* Inter-Agency Group on Economic and Financial Statistics (IAG)[2] are among efforts to this issue (IMF, 2012). Debtors' credit reporting system (DCRS), for example, distinguishes between external debt flows and stocks of the reporting debtor countries to assess their credit worthiness (Gobal Development Finance, 2012).

Some components of ODA flows are not part of this External debt stock data. These are full grants and technical co-operations that do not entail obligation of repayment.

2.3.   Aid, Domestic Saving and Economic Growth

The importance of national savings in promoting economic development have been well documented and recognized in literature as one of key factors in growth and progress of social developments (Azariadis, 2006).

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[2] *IAG* is a group of the following six institutions: The Bank for International Settlements (BIS), European Central Bank (ECB), Eurostat, the International Monetary Fund (IMF), Organization for Economic Co-operation and Development (OECD), United Nations (UN), and the World Bank (WB). It was established in 2008 to handle financial data: For more information see IAG Web site at:
 http://www.principalglobalindicators.org/about_iag.aspx.

Most studies employed simple regression analysis within Harrod-Domar type of GDP growth equations in which rate of capital formation is replaced by its components of domestic saving and 'foreign savings' and regressed on economic growth. Growth of gross domestic product (GDP) had been defined as a function of aid, gross domestic saving and other private capital inflows.

$$Y = f(S_d, A, F) \quad \text{... (2.1)}$$

Y is gross national or gross domestic product (GDP or GNP) as dependent variable; S_d is aggregate domestic saving (National income less total consumption expenditure); A is aid and F represent foreign private capital inflows (investment). These relationships are implied from the linear models of Harrod –Domar in which national output growth is proportional to change of capital stock (see White, 1992; Hansen &Tarp, 2000), thus:

$$\frac{\Delta Y}{Y} = \frac{\Delta K}{Y} . v \text{.. (2.2)}$$

Where, Y is output and K is capital Stock; Δ shows change (hence the ratios are growth rates in corresponding variables), v is a constant defined as inverse of incremental Capital Output ratio (ICOR).

The early thinking was that aid serves as increment to the capital formation by helping to bridge domestic 'investment- saving gaps' with other private capital inflows:

$$\Delta K = S_d + A + PF \text{.. (2.3)}$$

Where, ΔK is change in capital stock; S_d is aggregate domestic/national savings, A is foreign official aid and PF is other private capital inflows. However, the point of debate that later continued in both empirical and theoretical studies is the type of relationship between inflows of various foreign capital and domestic saving represented as follows[3]:

$$S_d = s\mathbf{Y} + \sigma A \text{ ……………………………………………...…….. (2.4)}$$

Where, Y is aggregate domestic product; A is foreign aid or capital - depending on how 'foreign savings' are defined across studies; *s* is marginal propensity to save from income in simple Keynesian aggregate saving function (**0**< *s*<**1**); **σ** is some constant (with absolute value between 0 & 1) that defines relationship between domestic saving and foreign aid inflows. This parameter has been point of debate in empirical studies of macroeconomic impact of aid literature. Hansen & Tarp (2000) call these group *first generation* empirical studies which were popular until early 1990s. The argument has been that foreign capital flows 'crowd-out' some domestic saving mobilizations in either private or public sectors for many reasons, so that **σ** in equation (2) is negative.

Consecutive researches on determinants of gross national savings have broadly specified the above model including demographic factors as explanatory variables (see, Baharumshah *et al*., 2002). In general, the basic empirical studies regarding effect of foreign aid had the same motive to prove the negative correlation suggested by 'saving

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[3] Detailed mathematical account of the models in proponents of 'Two-gap' framework and their early empirical applications is provided in Howard White, 1992

displacement' hypothesis (Hazari, 1976). However, later empirical studies, specifying more complete model, reported only small negative (mostly insignificant) correlations between foreign aid (A) and domestic savings, still supporting presence of moderate level switching in aid funds (Synder, 1990).

One group of study focused on how governments respond to large aid inflows through budgetary adjustments and efficiency of resource allocations [4] (Lipton, 1986; White, 1992; Thanoon and Baharumshah, 2003;)

Ouattara (2009), using panel dataset of 97 countries, suggested that only project aid flows were exerting a negative effect on domestic savings. It also confirmed the regional differences in impact on domestic savings of other forms of aid, highlighting importance of regional/country based studies in macroeconomic effects of aid.

In the next few sections, we will make a summary of studies on relationships between aid and economic growth, aid quality issues, and domestic resource mobilizations.

2.4. The Role of Aid in Economic Growth

The relative availability of capital resources, skilled manpower, and natural resources has been thought to be the factors determining the comparative advantage to any society. The

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[4] See for example, Lipton, 1986 who makes some reference to empirical studies on this regard. See also, Thannon& Baharumshah, 2003 who found significant growth contribution of Private capital inflows (FDI and short term flows) in Malaysian economy since 1980s, with an additional finding that both forms of private inflows displace national savings in the long run. This evidence is among the studies with robust dynamic econometric analysis supporting the 'crowding -out' effect hypothesis for private inflows.

capacity to maintain large proportion of GDP towards investments to accumulate capital base has long been recognized as engines to growth of an economy (Azariadis, 2006). The behavior of economic agents, particularly individuals and governments are important to determine path of national savings that in turn reflects potential capacity of future investments by domestic economic agents.

One main explanation for the fact that many developing countries are in *poverty trap*[5] situation is the concept of *coordination failure* that has gained wider popularity in development literature (Meblum, Moene, and Torvik, 2006). This has been developed in so called 'big push' theory.

2.4.1. Big Push and Scaling up Aid to Lower Income Countries

The low level of income and savings in developing countries means that they have been unable to undertake sufficient development projects for the successful progress in living standards by their own resources. For this reason, many developing countries had to look for foreign aid as the main sources of addressing various development needs.

Theory of "big push" is the main driving argument in effort for scaling up aid. The Economist (2011) explains this as follows: "In development, it seems, you cannot do anything until you can do everything, … even the simplest activity requires a network of

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[5] Meblum, Moene, and Torvik (2006) define poverty trap as a bad socio economic equilibrium outcome in a situation where there also exists a good equilibrium , and which is difficult to escape once fallen in the situation.

other activities and that individual firms cannot organize such a large network, so the state or some other giant agency must step in".

This main logic for massive inflow of aid to poor countries is to address desperate capital needs of these countries to come out of *poverty trap* with support of aid financed *big push* in investments and ultimately promote self-sustained development. This flow is expected to continue until sufficient domestic saving could be generated so that aid would be discontinued (Easterly, 2006).

Hans & Lutz (2004:11) argue that the overreliance on the hypothesis of big push might have resulted in over riding of domestic policy matters and less realizations of the expected outcomes from massive resource inflows.

White (1992) provided a common view of aid –growth linkages in more comprehensive approach than earlier studies where econometric and analytical methods used were less convincing. Hansen and Tarp (2000) categorized the empirical cross-country studies on aid effectiveness into three generations based on the respective analytical frameworks.

The first generation studies largely relied on Harrod –Domar type of model for empirical estimations in which aid was perceived as exogenous increment to capital stock adding equivalent increase in total savings for a dollar flow of foreign aid.

The empirical work on first generations of' two-gap' model continued till early 1990 with much focus and debate on how aid affects savings (Hansen & Tarp, 2000). In summary

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of 41 aid-saving regression studies, they found that there is negative aid –savings relationship suggesting a less than one to one translation of aid to investment.

Second generation studies are categorized based on the focus of aid impact from aid-savings to aid growth impacts mainly through investment channels.

The testable hypothesis on role of aid in growth through the investment channels, as done in most of second generation studies is represented as follows (reviewed by Hansen & Tarp, 2000; Harms & lutz, 2004):

$$i_t = \alpha_0 + \alpha_1 A_t + \alpha_2 pf + \alpha_3 s_{dt} + u_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.5)$$

$$g_y = \beta_0 + \beta_1 i_t + \beta_2 X_t + e_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.6)$$

Where, g_y= growth rate in aggregate output(Y); i_t= investment rate(I/Y); A = foreign aid (as ratio of Y); PF=foreign private capital inflows, s_d= is domestic saving rate (Sd/Y); X is set of other control variables that affect growth rate of output; u_t, e_t are error terms in the simple regression estimation. The coefficients α_1 and β_1 are estimates of a unit increamental impact of foreign aid (A) on investment and impact of investment rate on output growth rates respectively. Foreign capital and domestic savings, from behaivoral investment equation (2.5), would replace investment variable in growth equation (2.6). Therefore, the coefficient of aid in investment equation (α_1)is replaced by β_1^* in new equation (2.7), and other coefficients in new output growth equation are denoted by β_2^* for Pf_t , β_3^* for S_{dt} , and β_4^* for X_t as follows:

$$y_g \; = \; \beta \, _0^* + \; \beta_1^* A_t \; + \beta_2^* pf_t + \beta_3^* s_{dt} + \beta_4^* X_t \; + \; e_t^* \dots\dots\dots\dots\dots\dots\dots.(2.7)$$

Where, $\beta_0^* = \beta_0 + (\beta_1 \alpha_0)$; $\beta_i^* = \beta_1 \alpha_i$ for i = 2, 3 and $\beta_4^* = \beta_2$. All variables are as defined before.

Now this model of two gap approach, if the case holds, implies that 'aid adresses saving constrained growth' in developing countries recieving aid by filling investment gap and that inturn spurs groowth in a Harrod-Domar type of linear capital output relationships:

$$Y \; = \frac{1}{c} . \; K \; \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(2.8)$$

The above relationship is similar with equation (2.4). Here, Y=aggregate output(GDP), c= increamental capital output ratio (K/Y) which is assumed to constant in the two gap-approach, K is level of capital accumulated. Expressing output in gowth rates, we arrive at the following basic Harrod –Domar investment growth relationship:

$$\frac{\Delta Y}{Y} = \frac{1}{c} . \; \frac{\Delta K}{Y} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..\dots(2.9)$$

The left side is rate of change in output (economic growth), and change of capital can be approximated by annual amount of net investment (I) (gross investment after amount of capital depreciation rate of δ is accounted for). The estimations made on equation (2.6) types of empirical studies are derived from linear output growth equation in (2.9).

Three major criticisms of two gap model were identified by Harms & Lutz(2004). One is related to the assumption of fixed prices and static behaivor of economic agents including

government during foreign aid inflows. Second criticism is the assumption of constant capital-output ratio in analysis of investment. Third important issue not addressed was related relationship between aid and investment in which aid will likely not translated to investment by full amount of aid. Genneral government expenditure pattern may be changed with inflow of aid than directly using all aid in investment.

In general, a cross country studies have failed to provide conclusive results on how aid affects growth, savings and investments in particular, at least until 1990s.

Other important economic factor ignored in most previous studies is the role of incentive mechanisms in affecting investment decision and economic activities (Easterly, 2006; Hans & Lutz, 2004).

The *third generation* studies are represented by studies that recognize the role of policies and institutions, and aid delivery system itself in determining effectiveness of aid in economic growth. These new studies are largely connected with findings of Burnside and Dollar (1998) and some other earlier studies such as Hadjimichael *et al*.(1995). These groups of studies extended over the earlier two generations of studies to consider new growth theories by recognizing policies and institutions as major determinats of economic performances. Hansen & Tarp (2000) call these studies that followed above line as 'third generation studies' in macroeconomic impact of aid literature.

The commonly shared advances in *third generation* studies were reviewed with respect to four major analytical and methodolical aspects. Large panel dataset with many years and countries was much relied on. Secondly, distinict analytical approches supported by new

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developments in growth theories were utilized, such modelling policy and institutional quality indicators in the regression analysis. Third was the endogenity consideration for aid and other relevant variables in reduced form growth equations; Lastly, economic impact of aid is considered non-linear in such studies. The use of policy conditionalities through interaction terms with aid is considered as one approach to capture non-linearity of aid in grwoth specificatios (Hansen and Tarp, 2000).

Burnside & Dollar (1997) studied panel data of 56 developing countries using growth equations in which index of policy variables (fiscal balance, inflation and trade openess) was used as one explanatory variable in 'modified neoclassical' growth models. However, unlike most studies in standard growth estimation (see Levin & Renelt, 1992; Barro, 1991), the empirical analysis of Dollar (1999) and Burnside (1997) emphasized on role of policy, aid and their interaction in affecting economic growth. Their result suggested a robust positive impact of aid in presence of good trade, fiscal and monetary policies and no impact in absence of favourable policies in developing countries.

Growing numbers of studies on effectiveness of aid are inspired by findings on policy and institutional conditionality of aid effectiveness and such studies started gaining popularity among researchers, donor agencies, World Bank and others. In a review of the book published by World Bank (1998), *The Economist* (November 14, 1998) concluded that aid would have significant positive effect if allocated to 'right countries'. The right countries are those with high poverty level and 'good policies' (including 'low inflation,

small budget deficits', trade openness, 'strong rule of law', and efficient 'bureaucracy').

Broader survey of literature on macroeconomic impact of aid by Hansen & Tarp (2000) showed a generally positive impact of aid on economic performances in developing countries irrespective of their policy environments. The view on policy conditionality of aid effectiveness was however challenged by Easterly (1999) who could not find any significant effect of policy conditionality in his study of similar countries with more extended dataset.

2.5. Role of Aid in Public Investment Expenditure

Foreign aid in low income developing countries are often received by public sector for spending on physical infrastructure or developing human and institutional capacities. Aid could also be channeled directly to specific projects or as budget support to some broadly defined development programs of recipient economy. In either case, it is supposed to strengthen the productivity of economy of recipient country.

As argued by Kalaitzidakis & Kalyvitis (2008) an increase in ratio of public investment within foreign loan co-financing scheme can increase proportion of resources devoted to total public investments more easily in fixed tax rate regime. It will also increase ratio of public capital stock relative to private capital with positive implication on private sector productivity and economic growth. In their model, government can affect economy in two different ways when manipulating tax rate. Increased tax can distort marginal private capital productivity, while the increased public investment through taxation will improve

labor productivity including the private sector itself. However, the effect of taxation is non-linear as popularized by Barro (1990), where productivity raising effect of tax will overwhelm its negative impact at lower marginal tax rate and distortive effect takes its weight after certain optimum taxation rate.

Studies on optimal taxation and public expenditure are growing with developments of modern growth theories emphasizing role of public sector to private sector productivity and long term growth (see King & Rebelo, 1990; Glomm & Ravikumar, 1994). Augmenting public expenditure into production function, both theoretical and empirical studies have shown the importance of optimal fiscal policy tools in influencing income growth for small open economies.

Public goods and re-distributional taxation model by Tamai (2010) reveals that optimal taxation rate is non zero and it affects efficiency of public goods as compared to balanced growth models. This woulld work since higher saving behaivor of households results in lower willingness to contribute to redistributional taxation. A further distinction between types of taxation tools appears to have differential impacts on the incentive mechanisms.

Similar studies show that lump sum taxes do often have less or no distortive impact on incentive to save and capital formation, while positively contributing to public revenues (Anagnostopoulos & Qian Li, 2013). This is an interesting observation if it holds true in aid recipients with its policy implications for domestic resource mobilisation efforts.

The extent to which aid is systematically used for productive capital formation, an issue of 'fungibility' of aid resources, have been popularly taken as other possible explanations for differences in return to aid (Heller, 1975; Mosley,1980; Pack & Pack, 1993). Arguments and empirical evidences in above studies suggest that aid can increase public consumption by inducing governments to either squander domestic resources for consumption, when aid is conditioned, or to reduce 'tax effort'. Particularly, studies had found some evidences for African countries including Ethiopia, in this respect (Heller, 1975).

Furthermore, study by Mosley, *et. al.* (1987) distinguishes between two level impacts of aid on recipient's economy. These include the 'direct' leverage to economy through the projects financed by aid money, and indirec effect on spending pattern of public sector by providing opportunity to reshuffle overall spending plan by recipients. The latter impact is what commonly referred as 'public fiscal response' to aid.

In more similar fashion, it has been empirically found that aid has not been adding to capital formation on a one- to- one basis. Despite common understanding on enormous developmental roles of public investment on dams, roads, institutional capacity and human capital, empirical studies have consistently casted doubt on whether aid is actually contributing much to these activities (Easterly, 2001, 2006; Moyo, 2010).

The well-established aid to growth links through its investment channel of the 1950s and 1960s continued to face empirical challenges since early 1970s when the long perceived

positive links of aid and investment turned to pessimism. We can identify three main *ceteris paribus* (priori) assumptions on which the early 'orthodoxy' of aid and growth thoughts was built. The first presumption was that aid would translate directly to the necessary investment activities on public projects such as economic infrastructures.

The second assumption was based on the premise that capital accumulation is fundamental for developing countries and growth is considered *proportional* to ratio of investment in GDP. This assumption is the simple Harro-Domar equation with constant *Incremental Capital output ratio* (ICOR). This constant incremental contribution of capital [through increased aid] on output, were heavily criticized recently and empirical validity has been questioned, at least in short-run, be it in neoclassical or endogenous growth frameworks. Such assumptions in most of the early arguments for the models linking aid to growth through investment were main points for their less credibility (Easterly, 2001; Ranaweera, 2004). Similar point could be made regarding overemphasis of capital accumulation as main growth driver with 'aid driven investments'.

Although, the significant role of physical capital formation in growth and development is largely shared among economists, the notion of physical capital formation as "sufficient" condition is challenged and elaborated in subsequent development theories, where investment led *take-off* is not as likely to succeed as had been perceived. Rather, capital accumulation was recognized only as '*necessary*' condition, and not sufficient condition, (Amartya Sen, 1983, Easterly, 2006).

According to influential works of Nobel Prize winner Sen (1983), some of the real 'bottlenecks' to developing countries are lack of efficient enterprises, and weak capacity of people (health, literacy, longevity, education and social inclusions). This clearly implied the need to emphasize social change as main component of development process to any development effort by enabling people's capacity and their 'entitlements' to output in economy.

Since then, much focus shifted to distributional role of economic activity for broader development goals by focusing on social sector developments (education, health, others) as main driving horse.

2.6. Aid and domestic resource mobilizations

Mosley (1980) found important interrelationships between aid, economic growth and domestic resource mobilizations in his study of 83 developing countries in 1970s. He found that high aid recipient countries had weakening 'tax efforts' as well as low growth performances while low aid receiving groups were those country groups that registered more than average growth performances and rising 'tax efforts'. It was argued that efforts to build developmental budget from local resources would have likely prevented the possibility of diverting developmental aid in to recurrent expenditures. This argument considers aid inflows as income over which recipients would be able to plan as part of the resources at their disposal.

In this respect, the increased domestic 'tax efforts' in recipient countries have twofold benefits by properly channeling foreign aid to developmental purposes and enabling the economy to build own capacity to reinforce its sustainable progress and to gradually lean away from aid dependence. This may explain much of the empirical negative correlation results between aid and domestic resource mobilizations.

Monterey Consensus (2003) has echoed that official development assistance would complement domestic resource mobilization efforts, and paves way for capacity to attract private investments by building infrastructure and human capacity in least developed countries including Africa. Among suggestions put forward for domestic resource mobilizations were administration of "equitable and efficient tax systems", as well as improvements in public spending mechanisms to ensure that it does not 'crowd out' private investment ('medium-term fiscal frameworks').

More specifically, the high level consensus by international leaders recognized:

".....the need to strengthen and develop the domestic financial sector, by encouraging the orderly development of capital markets through sound banking systems and other institutional arrangements aimed at addressing development financing needs, ...… that encourage and channel savings and foster productive investments" (Monterrey Concensus, 2003: pp.8).

Moreover, official development assistance is recognized to raise capacity of mobilizing sufficient domestic resources in recipients mainly by enhancing human capital and export performances.

"ODA can help a country to reach adequate levels of domestic resource mobilization over an appropriate time horizon, while human capital, productive, and export capacities are enhanced." (IBID: pp.14).

The recommendations of Millennium project (2005) advisory group also emphasized [in second recommendation] the need for increased domestic resource mobilizations and public investments, besides scaling up of aid.

The limited productive capacity of individuals in poor countries (inadequate human capital, low infrastructure and core social, political and economic rights) were considered as key factors for low progress in these countries (UN Millenium Project, 2005).

2.7. Aid and Macroeconomic Management Challenges

The macroeconomic management challenges associated with large foreign capital inflow to recipients' economies has become other issue in aid literature. This aspect of aid has been wide in nature and could be sizable in consequence when domestic economy's capacity to absorb large aid inflow is weak. Possible challenges of aid include the pressure on export competitiveness through real exchange rate appreciation, increase in domestic prices and decrease in real interest rate, crowding-out private investment, and making monetary and fiscal policies less effective.

One criticisms of two-gap model was its inadequate integration of modern international economics and role of relative prices [and real exchange rate] in analysis of aid effectiveness for medium to long-term scenarios (Feldestein and Horioka, 1980; Wijinbergen, 1986). It may, however, be plausible to assume wage-price rigidities in short run macroeconomic settings as in Wijinbergen (1986) which may not necessarily holds in long term perspective.

Second challenge with unpredicted aid flows are related to its proper use for well-planned and priority areas. If the aid is used merely for unproductive uses, financing consumption budgets or on less productive targets, the borrowing may become less effective or sometimes a counterproductive. It is argued that inflow of foreign capital may add to difficulties of poverty reduction efforts if it immediately raises the consumption of the host country through a process that Azariadis(2006) called impatience of households. This would happen, when recipient countries increase current consumption by borrowing against future income that can ultimately results in decline of consumpton and capital ownership due to loan repayment costs when past loans had not financed productivite activities.

Despite some improvements in debt sustainability of many aid dependent countries, a list of countries named heavily indebted poor countries (HIPCs) had been in difficulties of servicing large external debts owed to borrowers. The 33 countries out of the initially 42 HIPCs classified countries, that also included Ethiopia, were from Sub-Saharan Africa (Were, 2001).

The above discussed argument of macroeconomic challenges of large foreign aid inflows is captured by the fiscal theory of state. It closely correlates the sources of revenue with a country's historical development performances mainly due to "…. the impact of resource distribution on bargaining power within the states" (Hoffman, 2002). This framework has been looking at how high foreign aid impacts institutional developments.

A cross sectional study on certain group of South and South East Asian countries proved that aid affects behavior of governments in receiving countries on fiscal policy decisions and hence resource allocations– consumption, public investment and taxation. It is also identified that both grants and loans had different types of effects on investment and taxation (Khan and Hoshino, 1992). Similar study by Salih (2012) on East African countries, suggested that aid tended to reduce tax efforts of governments while increasing both investment and current expenditures of public sector.

Studies have also showed that "...providing aid to central governments facilitates the maintenance of patronage-based political systems" (Hoffman, 2002). Hoffman (2002) contemplated the probable reason for the contradicting conclusions of different empirical study results were due to assumptions of direct effect of aid on investment and growth.

The third possible challenge associated with foreign aid is that increased demand pressure from spending of foreign aid will likely 'crowd out' private sector in accessing enough funds for investment from financial institutions. This happens when government has to use domestic currencies exchanged for foreign currency from domestic banks and financial institutions, then affecting interest rate in domestic capital markets, when all aid

has to be spent and in addition to maintaining exchange rate *[Brownbridge and Tumusiime- utebile, 2007].*

Nowadays, there is a growing consensus that aid by itself cannot lead to development. What matters most is how aid and other efforts can affect trade, Investment, and job creations, altogether activities that support private sectors, improvement in income distributions and poverty reductions.

2.8. Aid Coordination issues: Towards Better aid delivery System

Current architecture of development assistance is substantially changed and practically complex than the traditional thinking and aid delivery system of concessional resources to aid recipients. New aid tools emerged including budget support, debt relief, south-south cooperation and private public partnerships. The growing number of new group of players in development cooperation are other additions to these realities in current development assistances, all together posing associated aid volatility, fragmentation, and unpredictability that significantly challenge aid effectiveness (Fengler & Kharas, 2010).

Third observation on inefficiency of current aid delivery system is concerned about the number of donors running own projects causing challenges to recipients' capacity to implement. "……one reason that aid bureacracy is so excessive is that multiple aid agencies are all trying to do everything, which means they are duplicating each other,….to take on multiple goals to satify on its own conistutuency" (Easterly, 2006:

pp.167). Each aid program also need to be prepared, negotiated, supervised and reported with further constraint on the limited human resources and increases transaction costs in recipient economies (Fengler & Kharas, 2010). Proliferations tend to increase transaction costs for implementation of aid projects due to establishment and parallel running of planning, management and reporting structures for each interventions (Aldasoro *et al.*, 2010).

Moreover, the often uncoordinated interventions of players in the development sectors have led to costly problems in low-income countries. According OECD (2011), aid loses up to 25% of its value when delivery is not well planned, unpredictable, and an additional 10% through fragmentation.

Besides efficiency costs associated with less coordinated aid schemes, studies also show the large gaps between political level commitments and donors' actual implementations in recent years. Study of Aldasoro *et al.* (2010), for data between 1995 − 2006, indicated persistent aid proliferations and a systematic decrease in aid coordination efforts by major donors, notably USA.

An illustrative case study by Alemu (2010) on aid to Ethiopian health sector indicates the increasing number of donors[6], and multi-projects owned by sigle-donors with diwindling share of each project, particularly since1999. Such aid proliferation could compromise on its efective use and may entail further management burdens.

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[6] The study shows that more than 30 bilateral & 14 multilateral donors, excluding International NGOS, were operating in Ethiopian Health sector alone as of 2006.

Following such growing complex nature of aid delivery system, many political level discussions and academic researches seem to have commonly seen the inevitable role of aid *quality* in determining its effectiveness.

The initiatives on aid effectiveness and problems of inefficiency of aid delivery systems have been underway since 2003 in Rome to Paris (2005), Accra (2008) to Busan (2011) and various aid quality indicators have been kept separately on aid statistics termed as programmable aid (Kharas and Unger, 2011).

The establishments of 'Paris-Club' declaration on aid effectiveness (2005) initiated a national and international level debt reporting systems including the Credit Reporting System (CRS) of OECD donors. Some empirical studies have echoed doubts on practical donor coordination, and harmonization that was stipulated in 'Paris declaration' (2005) and Monterrey Consensus (2002). Claessens *et al*.(2007) found that recipient country efforts related to PRSP and HIPCs are factors that affect both size and quality of aid delivery. Aid fragmentation or donor concentration has been approached from both donors and recipients' perspectives in empirical studies.

2.9. Recent Empirical Studies on Foreign aid and Economic Growth

Beginning from 1970s, a growing number of empirical studies have applied the available data on aid to prove theoretical predictions of the so called 'two-gap' models- linking growth linearly to capital formation (see summary by Mosley, 1980; White 1992).

However, later researches had argued that aid resources could have been used for public consumption purposes than forming increment to capital formation so that the negative coefficients reported in the regression of aid on economic growth and aid on savings had been provided some theoretical grounds (see Mosley, 1980).

In other subsequent study, Papanek (1973) on the other hand, reported a positive and significant partial correlation coefficient of aid on growth in cross sectional studies of developing countries during 1960s to 1970s. He supported aid effectiveness in increasing growth by considering a slightly different approach to specifications of relationships among growth, aid, private capital flows, and domestic savings. Both groups of study above, however, have been challenged on many aspects including data measurement, and model specification flaws in their studies of cross sectional data[7].

Researches then continued to make clear that 'effectiveness' of aid varies across different groups of countries under income, public budgetary structure and other socio-political

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[7] Useful summary of some of early empirical works on aid and saving relationships is provided by Paul Mosley (1980) and White (1992).

categories. A more vivid picture in this regard was variations in aid-growth relationships for different income groups of countries as well as donor groups as UK, French and Scandinavian countries (Mosley, 1980).

To this difficulty was that clear understandings of the complex relationships contained in determinants of economic growth have been enhanced only gradually through time. The developments in basic growth models ranged from classical Harrod -Domar type models, neoclassical theories of conditional convergence models of Solow-Swan and endogenous growth theories. The latter theories have been those emphasizing roles of education and Human capital (Lucas, 1988; Rebelo, 1991; Barro, Mankiw & Sala-i-Martin, 1992; Becker *et al.*,1994; Hedtrich, 2012); Public expenditure on infrustructure and technologies (ideas) (Romer, 1986; Barro, 1988; Jones, 1996; Jorgenson, 2005); good governance, policies and institutions (Easterly, 1992; Barro, 1991; North, 2003); and interaction of human capital with better institutions (Glaeser *et al*. 2004).

Sindzingre (2012), for example, observed that the debates since 2000s had emphasized detrimental impacts of increased aid inflows when policy making paradigms are weak, particularly, in African countries. Policy making difficulties in the face of large aid flows include programmatic use of resources, necessary policy adjustments and macroeconomic managements of aid (see, for example, Loots, 2006).

It has been specifically shown that, in countries with weak institutions, large aid inflows had reinforced poor governance by entrenching bad governments (see surveys in Loots,

2006; Booth, 2008). New insights have been provided on ways of framing 'efficient' modalities in international cooperation towards socio- economic development targets of Millennium Developments Goals (MDGs).

It was followed by the consensuses, in policy dialogues, that increased size and quality of aid to developing countries was needed to address financing needs (Monterey Consensus, 2002; United Nations, 2008). Among the initiatives were the UN Millennium Project (2002-2006) initiated by Kofi Annan and coordinated by Sachs (including diverse experts from different institutions and private sector) - that some consider it as 'aid for trade' (see Erixon & Sally, 2006); 'Millennium Villages projects'[8], adoption of New Partnership for African Development (NEPAD) and its collaboration with UN system (in infrastructure, governance, food security, peace & security, others) (United Nations, 2009). 'South – South Cooperation' with group of emerging economic powers- the BRICS (Brazil, Russia, China & South Africa) are also becoming important development partners, particularly with Africa by maintaining more trade and investment relationships, providing project aid, concessional credits and grants (Economic Commission for Africa, 2013).

Following international aid campaigns, major European Union (EU) donors have promised to reach 0.7% of their GNP for ODA by 2015 with new financing mechanisms,

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[8] The 'Millennium village project' was an initiative co-founded by Earth Institute at Columbia University, UNDP, & Millennium Promise headed by Professor Jeffrey Sachs to serve as 'workshop' for scaling up of integrated rural investments that has already benefited more than a half million people. It is community–led approach in an effort to address extreme poverty, disease & gender inequality in selected villages of 10 African countries including Ethiopia (see The Economist, Dec 03,2011, May 14, 2012 for more appraisal).

and some Scandinavian countries have already surpassed the target as of 2010 (EUROPEAID, 2013).

Beginning from around the turn of 2000s, many studies started considering overall economic growth and effectiveness of aid as functions of many interrelated factors. These factors are related to macroeconomic policies, political, institutional, and nature of aid delivery itself (Aldasoro *et al*., 2010), and the incentive mechanisms in aid allocation for donor and recipient governments (Chong *et al*., 2009; Loots, 2006).

Possible explanations for many of the past 'self-inconsistent' study outcomes underlying notion of 'negative or positive' effect of aid on recipients' socio-economic progress, could be attributed to some of the following reasons.

1)   Different aggregation biases in many studies that try to analyze diversified countries in single cross sectional type of analysis. Aid effectiveness could vary with countries' institutional performances (rule of law, effective property right and justice system), trade and investment policies, fiscal and macroeconomic environments. Well documented theoretical studies in Rebelo (1991) and Easterly (1992) argue that proper policies can affect growth in important ways such as reducing uncertainities to economy, influencing cross border migration decision of [skilled] labor, and influencing size and efficiency of investments in private sector. Empirical findings also confirm that set of 'good economic policy' indicators (including out-ward oriented trade regime, low price intervensions, low black market premiums, & absence of financial repression), large investment and better educational attainments jointly can significantly raise long-run economic growth.

2) Various aid modalities (with associated differential impacts), and measurements used to represent 'foreign savings' in empirical investigations. Ouattara & Strobl (2008), and Ouattara (2009), have found that various aid modalities (project, program, grants aid) had different impacts on both domestic savings and economic performances of recipients.

More over, Serieux (2011) indicated that use of net ODA as indicator of resource transfer in a number of studies would overestimate the actual transfer available for expenditure in recipients, particularly in SSA, due to presence of 'reverse flows'.

3) Difference in methodologies & econometric estimation methods used to establish statistical relationship between economic performance & aid flows and the advances in analytical tools through time has been making earlier studies less reliable.

Both donors and beneficiaries have recognized that sustainable growth and poverty eradication has not been achieved in most of the cases despite large foreign assistances.

Many countries in Africa have long way to achieve sustained growth expected to through large aid. Three defining characteristics of African economic growth were identified by Ndulu (2002) a study of growth determinants for 21 Sub-Saharan Africa countries and group of 22 developed countries. Africa's growth had been significantly slower for over three and half decades. Slightly less than half of differences in growth between the study groups were explained by lower human and physical capital accumulations and to greater extent is owed to slow productivity growth in Africa. Another important observation was a sharp fall in return to investments (the incremental capital output ratio) from as high as

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28% to 4% following massive aid inflows and the rising investment activities through early 1970s to 1980s.

Recent studies in general tend to have resolved the seemingly inconclusive controversies that existed in aid literature since 1960s within the so called '*micro-macro paradox'*, by providing a more case to case evidences for the effect of aid on economic performances. Many cross sectional, panel and time series empirical studies confirm such observations. Durbarry *et al*. (1998) support the view that foreign aid has strong positive impact on economic growth but conditional on macroeconimc environment, income level, size of aid and other geographical location of recipients.

Audu(2004) studied relationships between forign aid, economic growth and public investments in Nigeria using data on debt accumulations during 1970-2002 and applying cointegration methods. It showed positive effect of marginal debt accumulations and non-linear nature of the relationships between such increamental flows with growth and public investment.

Melese Gizaw (2005) tried to test the 'debt overhang' problem in Ethiopia, and concluded that external debt stock positively related with economic growth, but the effect of debt servicing was found to be negative . This effect was presumed to be through the indirect effect of crowding out of public investment.

2.10. Role of Policies and Institutions in Aid effectiveness

Changing state of emphasis on aid effectiveness literature has been realized around late 1990s. The new growing concensus had been that 'good policy matters in effectivess of aid in recipient economy with studies of Burnside and Dollar (1997) and 'money plus policy' became main view influencing policy makers (World Bank, 1998; Hansen & Tarp, 2000).

Rodrik (2000) in one of influential study argued that the strategy of sound institution building should primarily be based on "local knowledge" than focusing on 'best practices' or "blue-prints". This view is based on the growing evidence on importance of incentive mechanisms and participatory "local knowledge" based planning and proper institutions contrary to the top down type of policy prescriptions made before identifying what works better. This was In similar vein, Easterly (2004) distinguished between the problems of 'planners' and 'searchers' with dilemma of aid induced planning by donors without full knowledge of local situations and development needs of ultimate beneficiaries.

Butterfield (2008) introduced a new *ex-post* aid conditionality concept that is based on "outcome" as a tool to transfer aid on "pre-defined benchmarks". He argued that advantage of local knowledge by recipients would solve the information and incentive gaps. He considers that "prize money" is the best incentive approaches to reward those having direct control on policy outcomes.

Given Ethiopia's high reliance on few commodity exports (Coffee Arabica), unfavorable change in world prices of such commodities highly affects the country's overall terms of trade and export income. Cashin & Pattillo (2000) found that the 1986-87 drop in world price of coffee had resulted in large fall of terms of trade (about 40%) and subsequently fall in national income of about 6% for Ethiopia.

Aid effectiveness and good governance has received much attention in recent policy dialogues on concerns of properly channeling aid towards promotion of development particularly with regard to corruption, efficient delivery and proper macroeconomic policy responses. The Accra High Level Forum for Aid effectiveness was prime reflection of challenge (Kaufmann, 2009).

Commitment to transparency and good governance are important to aid effectiveness. This understanding has recently attracted attention of major donors when OECD, the major coordinating organization for international community's effort on aid, mandated the DAC to work on aid effectiveness by establishing international forum, and working party on aid effectiveness.

The works of Burnside & Dollar (1997) empirically showed that foreign assistance has significantly contributed to economic growth of developing countries with good policy as described by property right laws, low inflation, and open trade regimes. They pointed out that aid is often used for public sector at margin than financing specific development projects in weak policy environments.

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Hudson and Mosley (2001) empirically reconsidered the above well taken principle that 'good policies determine aid effectiveness'. Using simultaneous system of equations, their result suggested that 'good policy' is crucial in stimulating economic growth. More importantly, it was suggested that narrower view of 'good policy' as 'free market policy' seemed less important in affecting aid effectiveness and suggested their complex interaction with macroeconomic variables.

The Monterrey Consensus is largely based on the idea that foreign aid is provides a good return when extended to countries with better institutions. Nevertheless, there appears to be less selective allocation of bilateral aid. A Study by popular scholars- Dollar & Levin (2006) confirms the observation that most bilateral and multilateral aid had been non-selective to countries. More specifically, they documented that aid had significant negative correlation with rule of law during the 1980s.

2.11. Development Plan, aid and Resource Mobilizations in Ethiopia

The resource mobilization for social development works and infrastructure is very key issue for promoting economic and social development. These efforts include increased private investments, attraction of FDI, and increased productivity of agriculture and linkages between sectors. For example, the telecommunications industry in Sub –Saharan African countries has recently been investing large billions dollars boosting the number of mobile users, creating thousands of jobs and improving the ease of doing business across the board (OECD, 2011).

Management of businesses and effective enforcement of measures have been weak in Ethiopia for long time. This has been reflected in low performances of government revenue from formal economic activities.

In recognition of these growing concerns that left the government revenue in poor performances, the Ethiopian government recently tried to respond by issuing new customs proclamation (Customs Proclamation No. 622/2009) that calls for strong system of law enforcement and strong customs control through measures like export goods certification, appropriate customs valuation of imported and exported goods (Federal Negarit Gazeta, 2009).

The country has long been reliant on foreign borrowings with low domestic resource mobilization rates in the courses of poverty alleviations. Ethiopia was the second top recipient of net official development assistance (ODA) next to Afghanistan in 2008 (OECD, 2011).

Currently, there are huge financial resource requirements that have to be mobilized more steadily than ever before to fuel the development projects prioritized in 'Growth and Transformation Plan' (MoFED, 2010). Despite domestic fiscal difficulties, mainly poor tax administration, and low private sector savings, Ethiopia is nowadays on a high move to implement large and the often quoted 'ambitious' Growth and Transformation Plan (GTP) (2010 -2015) that is supposed to double the national GDP within five years by 2015 and to become middle income country within upcoming decade (MoFED, 2010).

Implementation of the GTP (2010-2015) is expected to be accomplished largely through huge investments in state industrial enterprises and construction of public infrastructures. The government needs to spend about 33 billion USD of public investments (Davidson-Bloomberg, 2011) with financial resources expected from domestic sources and foreign borrowings (aid) (MoFED, 2010). The planned investments by public sector during 5 years' plan represent an average annual capital expenditure of around 21% of the GDP (calculated on the basis of the GDP in 2011).

Foreign loan worth of about 2.1 billion USD was disbursed to the economy in 2010/11 - an increase by 36% from previous year (MoFED, 2011). Similarly, it is expected that foreign resource inflow will grow substantially in the future.

However, given low domestic saving rates, there are growing concerns and uncertainties regarding availability and effectiveness of ever growing foreign aid to continuously fuel the priorities of national interests. Large foreign aid inflows can also exacerbate the inflationary pressure and credit availability to private sector in conditions of poor macroeconomic management and under developed capital markets.

2.12. Conclusions

Recent theoretical researches have recognized difficulty of explaining the divergence in world development patterns with use of standard economic analysis, as many developing countries had been falling behind in progress while other groups experienced fast economic developments.

A continuous improvement in productive capacities has been found very crucial to economic progress. Shortage of capital to finance key development infrastructures had been considered the main growth constraint in many developing countries. Gaps between domestic saving and investment targets were then expected to be filled by borrowing internationally as implied in *two-gap model* (White, 1992). It remained major thinking in development assistances, despite less appealing ex-post economic performances of many countries, particularly those in Sub-Sahara Africa (Easterly, 2006; Moyo, 2010; Seriex, 2011). The concept of 'big push' for scaling up aid to address the MDGs was popularized on very similar rationales.

However, the basic premises of the 'financing gap' model have been put under serious criticisms particularly on its assumption of static behaivor of governments in response to foreign aid inflows. Important findings are that general government expenditure pattern would change with inflow of aid and will not be fully translated into investment on one-to-one basis. Important economic incentive factors that influence investment decision and economic activities were ignored in earlier studies.

New studies since Burnside & Dollar (1998) extended on earlier macroeconomic analysis of aid by incorporating policies and institutions as major determinats of aid effectiveness.

The extent to which aid is systematically used for productive capital formation, an issue of 'fungibility' of aid resources have also been popularized as other possible explanations for differences in return to aid (Heller, 1975; Mosley, 1980; Pack & Pack, 1993).

Generally, macroeconomic impacts of aid is viewed at two broad levels. Direct leverage to economy and 'indirect effects' due to macroeconomic management challenges and changing public sector's spending patterns of recipients (Mosley, *et. al.,*1987). Empirical evidences also suggest existence of some reduced 'tax effort' and squandering domestic resources for unproductive consumptions of aid flows in African countries (Heller, 1975).

It is also identified that aid flows can create undesired macroeconomic effects when poliy making environments are weak and unable to make necessary policy adjustments during aid exopenditures (Loots, 2006; Sindzingre,2012). Aid effectiveness could also vary with countries' institutional performances, trade and investment policies, fiscal and macroeconomic environments. Various aid modalities also had differential impacts on economic growth and public investments (Ouattara & Strobl, 2008; Ouattara, 2009).

Both donors and beneficiaries have recognized that sustainable growth and poverty eradication has not been achieved in most of the cases despite large foreign assistances.

Another important observation was a sharp fall in return to investments from as high as 28% to 4% following massive aid inflows and rising investment activities through early 1970s to 1980s. It implies that investments made through aid projects are less efficient.

Recent studies in general tend to have clarified the seemingly inconclusive controversies so called '*micro-macro paradox*' in aid literature by providing case to case evidences. Durbarry *et al*. (1998) supports that foreign aid has strong positive impact on economic growth conditional on macroeconimc environment, income level, size of aid and other geographical location of recipients.

The new growing concensus had been that 'good policy matters in effectivess of aid in recipient economy with studies of Burnside and Dollar (1997) and 'money plus policy' became main view influencing policy makers (World Bank, 1998; Hansen & Tarp, 2000).

Given low domestic saving rates, there are growing concerns and uncertainties regarding availability and effectiveness growing foreign aid to Ethiopia, particularly in effort of implementing large government capital expenditure plans as envisioned in Growth and Transformation Plan (2010-2015). Large foreign aid inflows can increase the inflationary pressure and reduce private sector access to capital in conditions of poor macroeconomic management and under developed capital markets. This thesis intends to empirically fill knowledge gap regarding effects of domestic resource mobilization and aid on Ethiopian economy.

CHAPTER 3: AID AND MACROECONOMIC DEVELOPMENTS IN ETHIOPIA

Introduction

In this section, descriptive overview of the recent developments in Ethiopian economy with regard to aggregate income (GDP), saving rate, total investments, and trends of various foreign resource flows are provided. Moreover, detailed analysis of foreign aid dynamics in terms of modes of delivery, and its correlation with domestic savings and economic growth will be presented. Statistical correlation analysis among foreign aid, economic growth and domestic saving would highlight association of foreign aid with major macroeconomic changes and also can provide insights on appropriate econometric model specifications. Data for this chapter come mainly from National Bank of Ethiopia (NBE), World Bank's various databases (International Debt Statistics (IDS), World Development Indicators (WDI)) and OECD's Credit Reporting System (CRS).

The chapter is organized as follows: The developments in aggregate output, domestic saving, and investments are discussed in section 3.1 followed by systematic analysis of relationships between foreign aid and some macroeconomic variables in section 3.2. A more extended analysis of various foreign aid aspects in terms of financial terms, sources, sector wise allocations are provided in section 3.3; and finally, the proliferation of aid is discussed in section 3.4 followed by chapter conclusion.

3.1. Economic Growth, Saving and Investment Patterns

The saving and investment data shows significant gap between investment rates and the average yearly domestic savings in the last decade. Economic growth has been as large as 12.6% in 2009/10 and as low as -2.2%. The size of gross capital formation in economy has been large. The data is provided below:

Table 3:1 Real GDP Growth, Domestic Saving and Capital formation

Fiscal Year[9]	Real GDP growth rate	Gross investment[10] (% GDP)	Gross Domestic Saving[11] (%GDP)	Annual Inflation rates (%)[a]
2000/2001	8.3	21.5	10.0	-0.3
2001/02	1.5	24.1	6.0	-10.6
2002/03	-2.2	22.2	4.0	10.9
2003/04	13.6	26.5	11.9	7.3
2004/05	11.8	23.8	5.9	6.1
2005/06	10.8	25.2	4.6	10.6
2006/07	11.5	26.1	8.7	15.8
2007/08	10.8	22.4	5.2	25.3
2008/09	8.8	22.7	6.4	36.4
2009/10	12.6	24.7	5.2	2.8
2010/11	11.2	25.5	8.8	18.1
Average	8.97	24.1	6.97	14.811*

Source: National Bank of Ethiopia (NBE), annual report 2012,

Average for 2002/3 – 2010/11; /[a] ; Average annual basis and the December 2006 is base year for inflation rate

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[9] Ethiopian Fiscal year starts from July 1 to June 30 of next year, and reports are available in that format
[10] Newly Revised MoFED source, NBE Main annual Report document 2010/11
[11] NBE Main annual report 2012

The average gross investment rate has been as high as 24% of GDP. On the other hand, average domestically mobilized aggregate savings had been less than 7% of GDP, showing significant gap between domestically available capital and the investments activities associated with large average economic growth in the past 10 years.

The presence of such gap implied large net inflow of 'foreign savings' that have made such high capital formation very possible. The difference between rate of investment and domestically mobilized resources shows that about 14% of GDP in investment had been filled by resources flowing to economy over the last 11 years. On the other hand, gross domestic savings had been financing only less than 29% of total investments on average, thus the remaining about 71% of gross investments had been financed with various forms of net foreign resource inflows. It is also implied that the low domestic saving trend has persisted over recent years. According to typical *two gap model* of foreign aid, *resource gaps* in such studies could 'indiscriminately' call for aid to fill the 'saving-investment gap' associated with certain growth targets.

However, it would be too general to consider all resource inflows from abroad as foreign aid or flows that serve investment purposes in nature. Therefore, the composition of foreign aid and other resource inflows are examined in the next section.

3.1.1. Composition of foreign Capital flows to Ethiopia

The nature and trends of foreign resource flows to Ethiopia since 1990s is shown below in comparison to average developing country groups.

Table 3: 2 Compositions of foreign resource inflows: 1992-2010

Flows as % GNP	1992-1994	1995-1997	1998-2000	2001-2003	2004-2006	2007-2010
Ethiopia						
Grants	8.97	7.06	6.52	11.28	23.07	10.34
Loans	2.65	1.10	1.340	5.58	3.05	3.67
FDI	0.10	1.24	1.94	4.36	3.74	0.80
All Developing Countries						
Grants	1.00	0.73	0.73	0.88	0.97	0.64
Loans (PPG)	1.52	1.63	1.01	0.14	1.04	1.36
FDI	1.58	2.35	2.899	2.60	3.18	3.37
Sub-Sahara Africa						
Loans	1.73	1.19	0.03	0.30	0.28	1.14
FDI	0.88	1.70	2.34	3.73	2.54	3.47

Data: from International Debt Statistics (IDS) database with author's calculations

The data on loans shows net flows on public and publicly guaranteed (PPG) external debt which in turn represents the long-term borrowings by government or public enterprises of developing countries from concessional official donors and from [non-] concessional private borrowers.

Ethiopia received highest 'foreign aid' relative to its GDP when compared to developing and Sub-Sahara African countries. This implies the high aid dependence of Ethiopia relative to average recipient country. However, this may not necessarily mean largest aid in dollar terms. The Flow of Foreign Direct Investment (FDI) to the country had been lower than average country groups. FDI was small in terms of national income, throughout the last two decades, except during 2001 to 2006 when it represented about

4% of GNP. Over all, Ethiopia has been receiving foreign aid ranging between 7.8% and 26% of its gross national income during 1992 to 2010, and only less than 2% of FDI for many years.

3.2. Relationships among ODA, Domestic Saving & Real GDP Growth

Simple Statistical analysis for the relationships among foreign aid, aggregate domestic saving and real GDP growth show presence of interrelationships among the variables where one of the variables is predicted by the others. Analysis of variance (ANOVA) suggests highly significant interrelationships among foreign aid, economic growth and gross domestic saving although exact causal link and sizes are not determined at this level.

Table 3: 3 ANOVA Tests for Aid, Real GDP growth and gross domestic saving

SUMMARY				
Groups	*Count*	*Sum*	*Average*	*Variance*
RGDP Growth	30	143.7007	4.790022	47.81093
ODA/GDP	30	318.3355	10.61118	18.21797
GDS/GDP	30	254.3466	8.478222	13.67601
ANOVA: Test Results				
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value**	*F crit (1%)*
Between Groups	520.3825	2	260.1913	9.793296	0.000146	4.85777
Within Groups	2311.442	87	26.5683			

Source: Statistical output of MS-Excel (data from World Development Indicator- WDI)

*Note: All variables are expressed as a percentages; * Significant at 99% confidence level*

A bivariate analysis of data on ODA and real economic growth also clearly shows that the variables positively move together. It also suggests variations in economic growth for certain proportion of aid across years. This analysis intuitively implies the presence of other factors affecting effectiveness of aid.

Figure 3: 1 Relationships among ODA, Real GDP growth and Domestic Saving
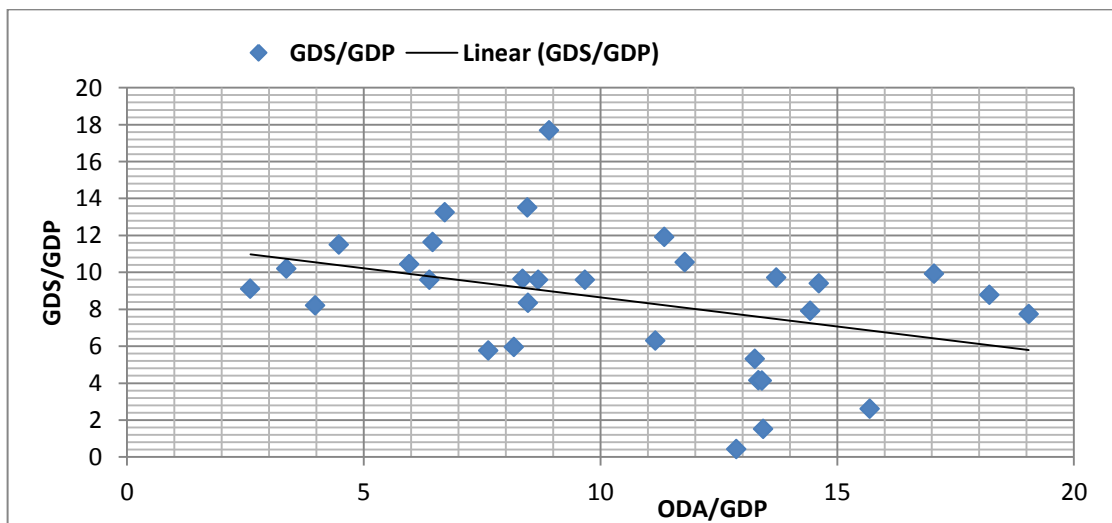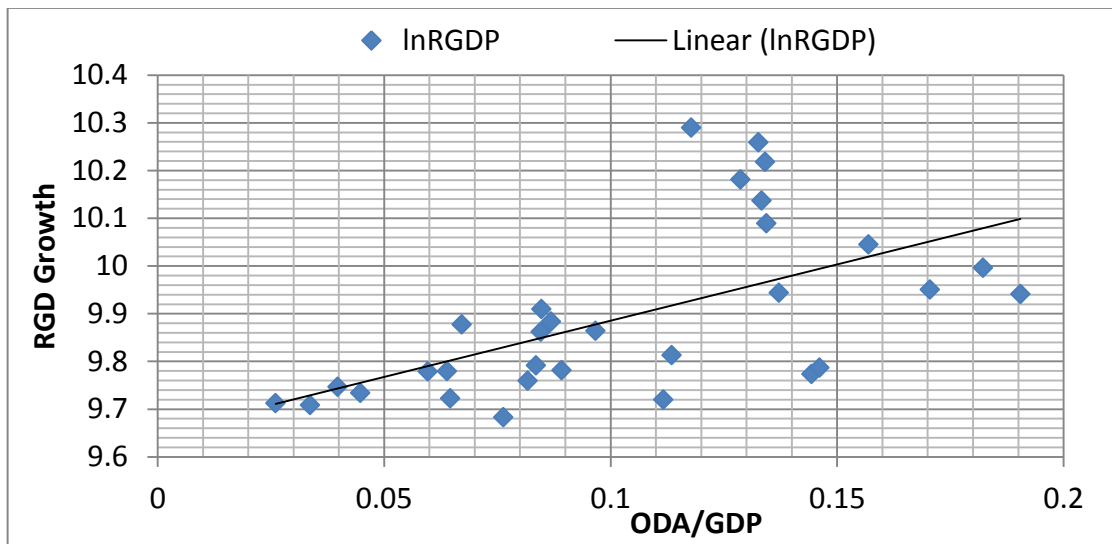
Data source: World Development Indicators;   *(GDS= Gross Domestic Savings)*

On the other hand, the scatter graph between ODA and domestic savings shows less clear relationship. However, it appears to be somewhat negative and less strong on average. This may provide some evidence to claim that foreign aid displaces some of domestic aggregate savings. This less clear evidence would be statistically proved for robustness to statistical tests in fifth chapter.

3.3. Trends and Composition of Official Development Assistances

Net Official Development Assistance (ODA) data is presented to analyze the trends of annual net foreign resource flows to Ethiopia from official donors. This net ODA flows represent the sum of disbursement of resources (net of repayment of earlier principal) made by official agencies of OECD bilateral donors and multilateral institutions to Ethiopia. ODA is mainly extended in the form of loan on concessional terms (at least 25% grant element), full grants in cash and technical cooperation assistances.

Table 3: 4 Trends of ODA flows to Ethiopia (In Million US$)

Category	Average annual flows (Million US$)(nearest two digits)			
Average Annual flows	**1971- 1980**	**1981 - 1990**	**1991 - 2000**	**2001 – 2010**
Net ODA (current US$)	120.47	579.252	865.96	2,307.49
Net ODA (at 2010 US$)	399.25	1,201.08	1,236.06	2,541.85
Flows in 2000s compared	6.36 times	2.12 times	2.05 times	1 times
Total net flows in decade				
Total ODA (current US$)	1,204.67	5,792.52	8,659.55	23,074.86
Total ODA (2010 US$)	**3,992.46**	**12,010.76**	**12,360.57**	**25,418.46**

Source: World Bank, International Debt Statistics, 2013

It is shown that Ethiopia has been receiving increasingly large amounts of net ODA every year through development decades. The country has totally received 53,782 billion USD (at 2010 $ value) worth of net aid during the last 40 years. This amount is substantial particularly in relation to its economy size. The average flows during 1970s, measured at current dollar face value, was relatively low at about 120 million USD per year, and continued to rise on average throughout following decades. Average flows in real terms shows the amount in 2011 to be about 3.6 times that of average flows in 1970s and around 2 times of the average annual flows throughout 1980s and 1990s.

Table 3.5 (Part-I) also shows that Ethiopia has been receiving increasingly large amounts of aid in per capita terms, at its highest of 38 US$ per-person during 2005 – 2010 from its less than 3$ during 1971-1975, to roughly doubling its size every ten years then onwards.

Comparisons with average groups of Heavily Indebted Poor Countries (HIPCs)[12], Pacific Island Small States (PSS), Least Developed Countries (LDCs)[13], and Sub-Saharan Africa (SSA) is provided in table 3.5. Dynamics of aid with 5 years' average as a medium term planning horizon is analyzed. It represents donors' response to Poverty Reduction Strategy Papers (PRSP) for delivering aid as a better scheme to promote "ownership" of

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[12] IMF has identified a list of 39 countries that have been qualified & potentially eligible to receive HIPC initiative's Assistance as of March 2013, including Ethiopia (IMF, 2013b).

[13] UN Economic and Social council (2003) defines Least Developed Countries (LDCs) as the countries that meet three criteria: a) low National income (three year average GNP between$750 & $900), b) weak human resource involving composite Human Asset Index (HAI) constructed on education, Health, Nutrition & Adult Literacy, and c) economic vulnerability. There are 48 LDCs with more than 75% of population living in poverty as of 2011(see report of Fourth United Nations confrence on LDCs, 2011).

aid financed programs towards focused and better results (see Radelet, 2004; IMF & IDA, 2010; IMF, 2013a).

Table 3: 5 Trends in net Aid flows: 1971- 2010 (at constant 2010 US$)

Year	1971 - 1975	1976- 1980	1981- 1985	1986- 1990	1991- 1995	1996- 2000	2001- 2005	2006- 2010
Per-capita net ODA (in US$)			**PART-I**					
- Pacific Islands	39.17	95.76	95.47	132.04	220.09	216.89	229.70	342.84
- HIPCS	7.91	18.43	23.37	36.27	42.13	29.00	42.34	64.03
- LDCS	7.24	16.27	20.21	28.42	29.78	20.50	30.21	47.14
- SSA[a]	6.62	14.40	19.16	29.30	33.11	22.75	32.46	50.56
- Ethiopia	2.57	4.61	9.43	17.32	19.82	10.92	21.94	38.22
Net ODA (% of gross capital formation)			**Part-II**					
- Pacific Islands	---	38.58	33.42	59.00	76.16	59.99	59.39	46.66[a]
- HIPCS	---	29.43	40.79	63.68	84.74	50.93	58.97	47.64
- LDCS	---	43.84	44.79	56.99	62.77	37.88	41.43	32.87
- SSA[b]	---	13.77	17.29	27.69	34.36	24.34	29.73	24.10
- Ethiopia	---	---	32.49	44.85	83.55	42.73	72.43	58.10

Source: World Development Indicators (WDI) database, author's calculations of averages

/[a] : Available data for Pacific Island countries ends at 2008, thus it represents a 3 year average value (2006 – 2008); /[b] : It represents the developing Sub-Saharan African countries

Pacific Small Island States (PSS) are the most aid dependents in per-capita terms (342.84 $) followed by HIPCs (64.03 $), LDCs (50.56 $), SSA (47.14$), and Ethiopia (38.22$) since 2006. Generally, net development assistances have been steadily increasing in Ethiopian and all country groups, until it saw sharp decline for some years since 1993.

Figure 3: 2 Trends of aid flows to Ethiopia & other recipient groups: 1971-2010
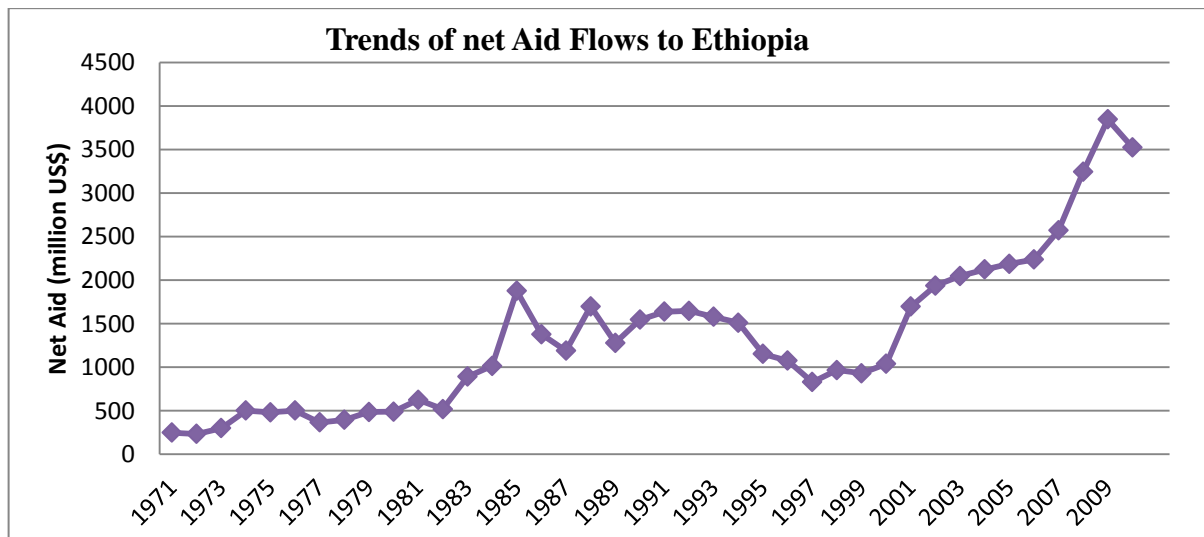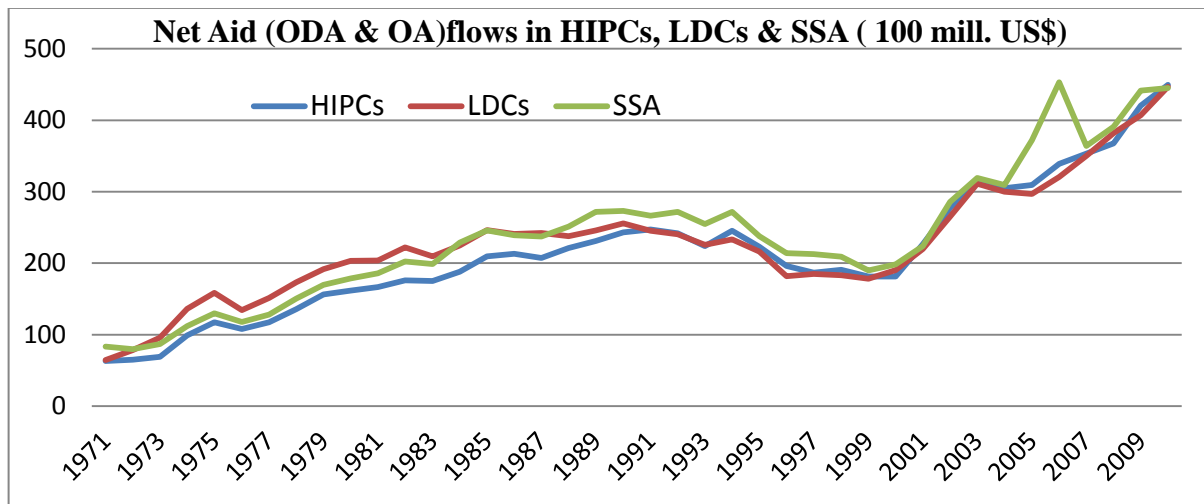
Data source: World Development Indicators' (WDI) data base, 2013

The declining pattern of aid flows to the major recipient groups during 1990s could be attributed to the abruptly referred phenomena of '*aid fatigue*' among donor communities as aid fails to increase and has rather decreased (See JICA, 2003). It might also be considered as reflection of change in donor priorities after end of cold war, domestic pressures from interest groups for aid to Africa, and domestic budgetary pressures in donor countries (Harms & Lutz, 2004). This was also coupled with times of macroeconomic difficulties in donor countries during early 1990s.

An important feature of aid flows to Ethiopia is its average steady rise through time, besides fluctuations associated with global aid related phenomenon of 1990s and larger humanitarian flows following the 1985's major drop in harvest[as a result of unexpected drought].

Another important feature implicit in above data (part-II of table 3.3), is the importance of Aid in total gross capital formation of the average countries. Aid flows represented large percent of gross capital formation, with about 60% for Pacific Island Small States (PSS), 51% for average HIPCs, and 42.7 for Ethiopia during 2001-2005. Size of aid in relation to gross capital formation has been unanimously smaller in Ethiopia, except that it was larger than SSA until 1990. While it had been decreasing for all average countries, it turned highest in Ethiopia since early 1990s.

This finding provides tentative conclusion that other aid recipients in the groups have diversified their gross investments efforts better than Ethiopia. This could be through domestic efforts, attraction of foreign private investments or a combination of the two.

This conclusion is in line with earlier finding that foreign direct investment flows to average developing/SSA countries is increasing more than its flows to Ethiopia. Institutional and policy efforts with regards to major investment climate to attract private capital inflows may take time to respond. This might be an interesting area for further study in other researches.

Moreover, information in *table 3.6* below reveals the increasing share of Ethiopia in total Aid flows to SSA from average 3.58% in early 1970s, to level of 7.36% during 2006-2010, besides slight drop during late 1990s.

Table 3: 6 Relative size of Aid flows to Ethiopia

Average net Aid received (Million US$)[1]	1971-1975	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010
- LDCS	10669.9	17071.9	22128.6	24454.7	23227.5	18372	27855.2	38132.6
- SSA[a]	9830.9	14887.1	21236.6	25445.5	26053.7	20484	30204.5	41894.9
- Ethiopia	352.0	446.5	984.5	1417.6	1504.9	967.2	1998.5	3085.2
Ethiopia's % share in Aid								
- SSA	3.58	3.00	4.64	5.57	5.78	4.72	6.62	7.36
- LDCs	3.30	2.62	4.45	5.80	6.48	5.26	7.17	8.09

Source: Data from WDI database

Combining analysis from earlier trends on annual flows, it could be argued that the increasing attention given by donors' aid program to Ethiopia since 2000s can be related to observed progress in overall socio-economic developments of the country since 2003.

Ethiopia stands amongst fast growing developing countries in both social and economic indicators with average growth rates of over 10% since 2003. Part of the reason could also be related to other strategic significance of Ethiopia in East Africa, in recent effort of stabilizing Sudan and Somalia States (Alemu, 2009) backed by powers such as USA in 'fighting against *terrorism'* (BBC News, 2011; Prince, 2011).

Such increasing multilateral as well as bilateral cooperation would be much beneficial with wise governance in place to make better utilization of diversified inflows of resources towards developmental ends. At this point, it is more important to further examine the composition and mechanisms of aid delivery as it is other important aspect that can affect developmental impacts and efficiency of aid. This point will be elaborated in next section by examining proportion of developmental aid, its channels/sources and allocations to examine some of its *quality* besides quantity.

3.3.1. Sources and Compositions of Foreign Aid flows

The data indicates that Africa in general and Ethiopia in particular have been benefiting from the large and increasing concessional components of ODA (more than 80%) and grants in particular since 2003. This increase in the concessional assistance partly reflects commitments of many donors in achievement of MDGs by providing more 'generous' resources to low income developing countries. This is significant move towards the pledge made in Monterrey consensus (2001) and continuous reiterations at Doha Conference on Financing for Development (2008).

Table 3: 7 Grant components of ODA disbursements (measured at 2011 US$)

Part A: Grant &Loan composition of ODA					
	Share in total ODA (%)	2002	2003-2005	2006-2008	2009-2011
Ethiopia	Grant	46.28	83.55	90.96	79.50
	ODA Loans	53.72	16.45	9.00	20.50
Africa	Grant	71.05	81.39	86.59	80.07
	ODA Loans	28.92	18.56	12.74	19.01
Part B: Share of IDA & AfDF in total ODA loan disbursements					
	% of total loans	2002	2003-2005	2006-2008	2009-2011
Ethiopia	IDA	76.08	70.78	51.70	62.82
	AfDF	13.27	14.013	20.52	20.22
Africa	IDA	49.26	51.69	45.47	35.92
	AfDF	10.39	12.18	13.18	13.12
Part C: Trend in loan volumes from IDA & AfDF					
Countries	% Change in loan	2002	2003-2005	2006-2008	2009-2011
Ethiopia	IDA loan	--	-31.10	-2.93	76.42
	AfDF Loan	--	76.77	12.66	70.46
Africa	IDA Loan	--	-6.97	-5.91	6.00
	AfDF Loan	--	7.85	7.42	8.41

Data source: OECD, CRS database: own calculation for averages

Ethiopia had benefited from increasingly large grant assistances with about 95% in total

ODA during 2005, from its average 46.3% in 2001, and relatively larger project based

loans since 2009. Large grant aid, however, may have some possible adverse effects on

the development of institutions, particularly in countries with high corruption, and domestic political instability.

The growing concessional loans from African Development Bank (AfDF) and World Bank's IDA (particularly since 2009), reflects large engagement of these lenders in such projects as infrastructural investments associated with recent economic booms in most African countries. The two multilateral borrowers together accounted for 72% to 89 % of ODA loans to Ethiopia and 49% to 64% in total loans to Africa between 2002 and 2011(part B of table 4:7). Their relative engagement in Ethiopia is very high as compared to other African countries. Particularly AfDF has [on average annually] increased its loan to Ethiopia by about 76.8% during 2003- 2005 and by about 70.5% during 2009 to 2011. The dominance of few multilateral donors to Ethiopia would have significant implication in the development and efficiency of aid delivery.

3.3.2. Modalities of ODA delivery to Ethiopia

Analysis of major 'sectors based allocation' (OECD categorical terms), is provided below:

Figure 3: 3 Sector basis Disbursements of ODA
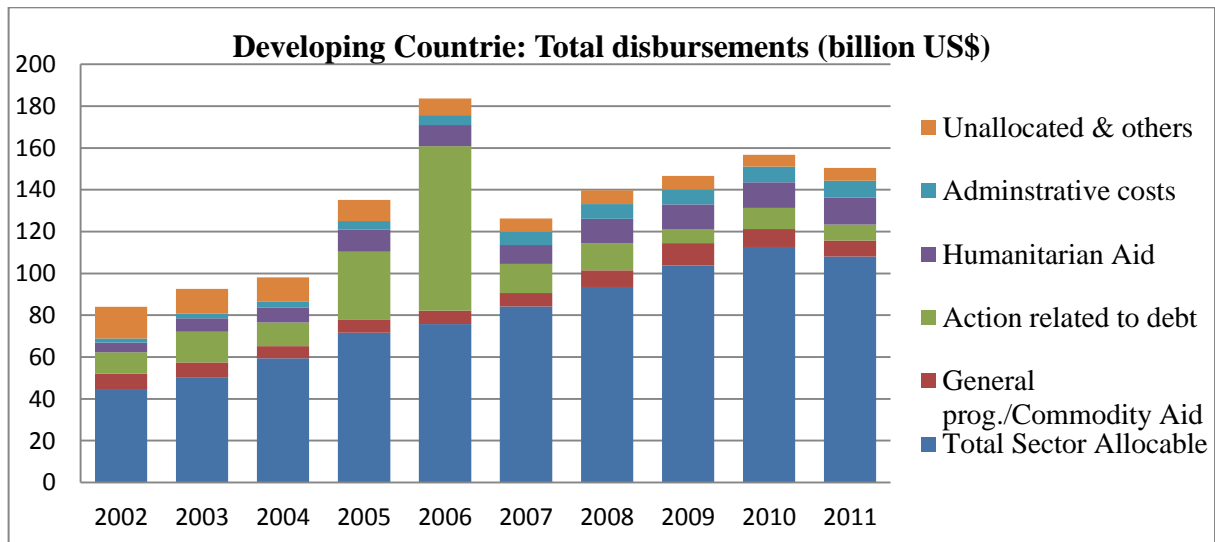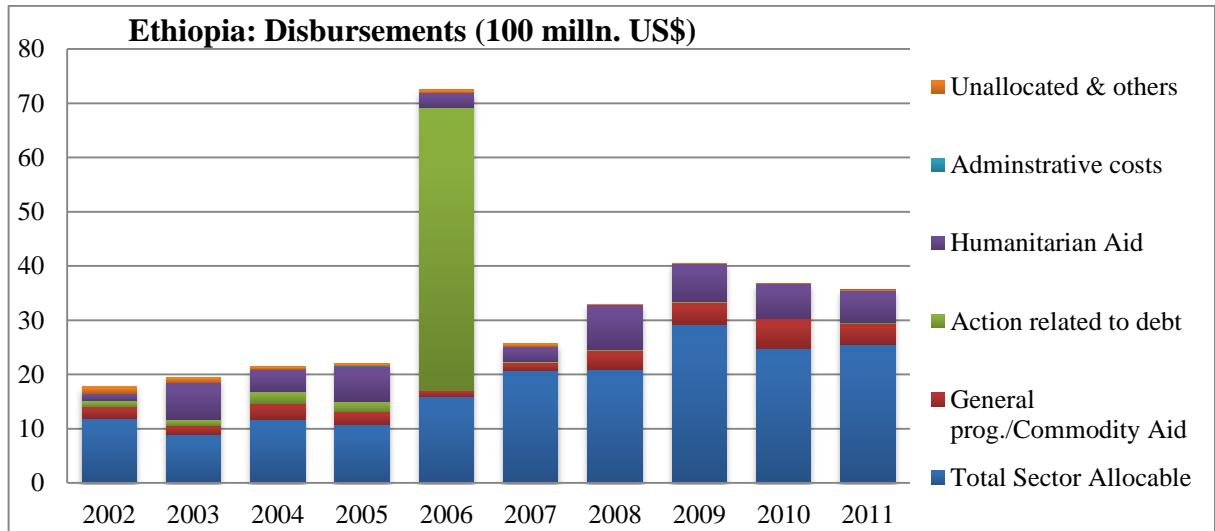
Source: CRS online database

It appears that sector allocable aid disbursement to all developing countries and Ethiopia has been significant with steady growth pattern in the past decade. An exceptional observation is the large debt related 'disbursements' made in 2006 due to debt reductions

of Heavily Indebted Poor Countries (HIPCs) and MDRI, joint initiatives of IMF and The World Bank. The premise was that large 'unsustainable debt' acts as "drag on development" so that large debt relief is needed for HIPCs (UN General Assembly, 2002: 11). Ethiopia had received large debt related 'disbursements' of about 5.2 billion US$ in 2006. These actions include full cancellations of some debt, re-scheduling/refinancing, and debt for development 'swamp' arrangement. Further analysis indicates that aid to social infrastructure building has been much larger and increasing at faster rate than other sectors. It could be easily seen from diagram below.

Figure 3: 4 Evolution of Sector Allocable ODA flows to Ethiopia

Sector Allocable ODA disbursement (100 millin US$)
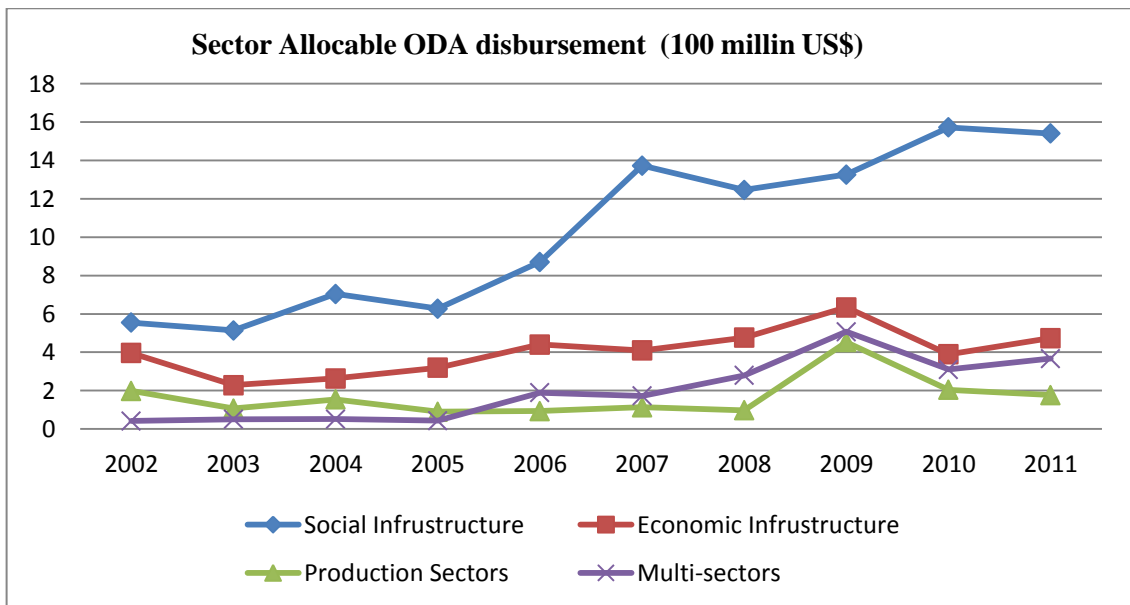
Source: OECD, CRS

As seen above, total funding to social infrastructure and services, including health and education has been increasing relative to economic infrastructure and support to

production sector (agriculture and industry). This implies the strong emphasis on human resource and social service development as main part of MDGs.

The Ethiopia's debt level during early 1990s had been very high, reaching its historical peak level of 141% of GNP in 1994. The associated debt serving level was 41% of export earnings in 1996 (figure 3:5 & 3:6 below). This might had substantial constraining effect on the country's capacity for growth and investment. Debt related 'disbursements' were continuously underway for 39 countries as of 2013 (IMF, 2013b).

Some ODA disbursements represent donor's administrative costs and humanitarian aid. Moreover, some of disbursements are used to finance the so called 'reverse flows' as shown in study of SSA countries by Serieux (2011).

Figure 3: 5 External Debt Stock as % of Gross National Product (GNP)

Sources: *International Debt Statistics (IDS) database*

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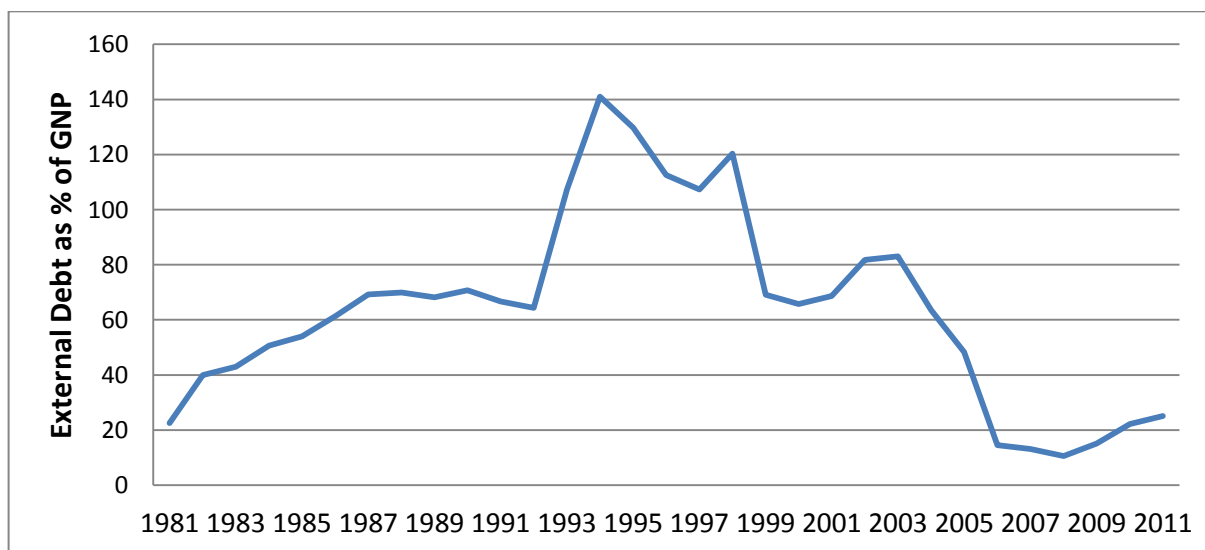
Figure 3: 6 External Debt Services in percentage of Export & primary income
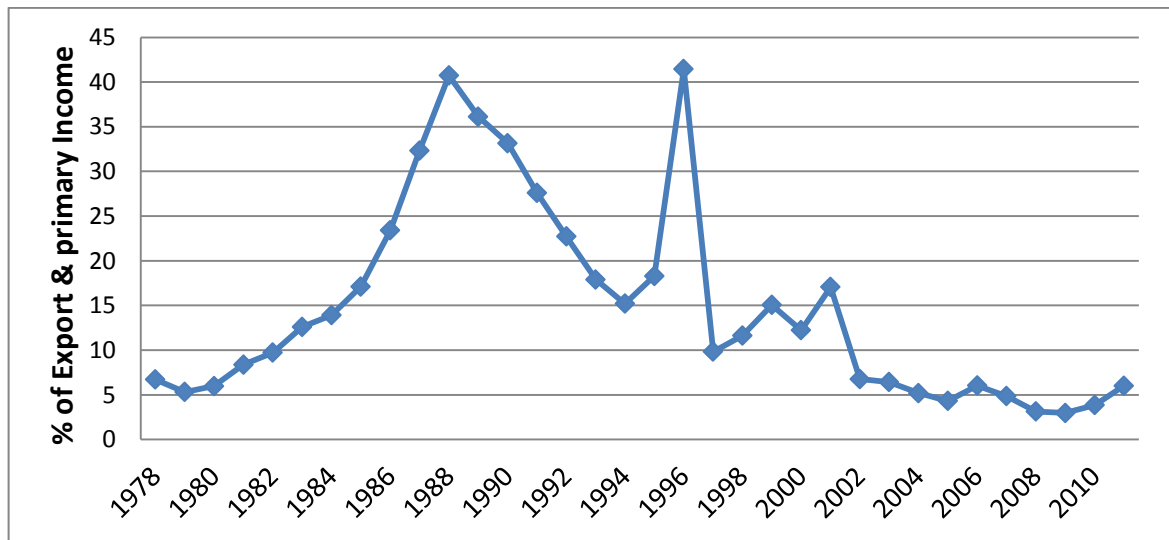
Sources: *International Debt Statistics (IDS) database*

The issue of debt cancellations for developing countries was not unequivocally supported in the major donors' dialogue and initiatives. In particular, Japan did hold on the issue formally until 2003 by arguing for the possible 'moral hazards' associated with debt cancellations (Sato, 2005). Japan's commitment to Africa's peeace and development has been significant since early 1990s in mobilizing international efforts. The Tokyo International Conference on Africa's Development (TICAD) is among such invaluable supports (Sato, 2005; Menocal & Wild, 2012).

3.4.   Proliferation of Aid Channels

Recent studies consider involvement of many donors in same sector/country as more *fragmented* aid delivery system. Among case studies conducted on this issue were Mwega (2009) on Kenya, Chen (2010), Masyrafah & Mckeon (2010) on Indonesia and

Alemu (2010) on aid for Ethiopian health sector. The widely used measure of donors' concentration or 'aid fragmentation' is Hrischman – Herfinadal Index (HHI)[14].

It is constructed by taking squared sum of each donor's share in total aid to particular country/ sector (see studies: Kharas, 2007; Mwega, 2009; & Steinwand, 2013).

Table 3: 8 Concentration of donor funding in Ethiopia: HH Index (200-2011)

Year		HHI for overall economy and major sectors			
	Number of donors	**Overall Disbursements**	**Education**	**Health**	**Economic infrastructures**
2002	31	0.222	0.218	0.210	0.379
2003	32	0.204	0.135	0.146	0.344
2004	30	0.161	0.122	0.246	0.357
2005	32	0.179	0.114	0.152	0.204
2006	34	0.353	0.197	0.206	0.199
2007	34	0.096	0.498	0.238	0.182
2008	34	0.127	0.126	0.117	0.254
2009	37	0.136	0.393	0.217	0.286
2010	38	0.131	0.402	0.124	0.286
2011	37	0.119	0.387	0.172	0.310
Average	--	**0.1728**	**0.2592**	**0.1828**	**0.2801**

Source: Credit Reporting System (CRS), HHI calculated on ODA disbursements

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[14] $HHI = \sum_{i=1}^{n}(ai/A)^2$, where, i= 1, 2,.., n for **n** number of donors; **a** amounts of official aid provided by donor **i** as proportion to total aid **A** provided by all donors (A=Σa_i) to the country or sector considered. Other measure of aid fragmentation called *Theil* index (TH) is also used (see Aldasoro *et al*., 2010 & Nunnenkamp *et al*., 2011).

The index ranges between 0 (perfect fragmentation) and 1 for perfect concentration (single donor). The higher the value of HHI, the larger the share of major (lead donors) and the better it would mean for recipient economy to manage aid efficiently.

The number of bilateral and multilateral donors to Ethiopia has been increasing through time while average share of donor in overall aid had been getting smaller. Corresponding HH index has been getting smaller on average, in exception of its largest 0.353 in 2006. The economic infrastructure financing generally had higher HHI implying better donor harmonization followed by education sector.

The presence of few major donors in education sector is encouraging phenomena recently as measured by larger HHI (around 0.4 in 2010 and 2011). On the other hand, health sector financing by donors is most fragmented with less than 0.2 HHI on average.

UK had been a leading donor in education sector, accounting for over 70% of total aid to the sector in 2007 and about 62% since 2009. World Bank's IDA is leading donor from multilateral donors (above 40% in 2002). Presence of few large donors relatively in education might have contributed to better aid harmonization and better management of its outcomes in the sector.

A point worth noting here, however, is that the nature and approaches of each donor to project/program aid matters most in its overall developmental impact. As an illustration, the participatory Japanese 'micro-project' technical assistances for agriculture and

education sectors in Ethiopia (MoFA of Japan, 2008) can arguably have superior effect in raising productivity at grass root level.

3.5.   Conclusion

Role of gross capital formation in Ethiopia's recent robust economic growth has been significant, accounting on average about 24% of GDP over past 11 years. On the other hand, domestically mobilized average savings had been less than 7% of GDP, showing significant gap between domestically available capital and the investment activities. The difference between rate of investment and domestically mobilized resources shows that about 14% of GDP in investment had been filled by various forms of net resource inflows from abroad representing over 71% of total investments (excluding remittances).

Trends of foreign aid flows to Ethiopia had been increasing through time, ranging between 7.8% and 26% of GNP during 1992 to 2010 which remained the largest as compared to average developing or SSA countries. On other hand, foreign direct investment (FDI) flows to Ethiopia had been lower than average country groups during past decades. This provides conclusion that Ethiopia had less diversified capital formation efforts than other average countries in Africa and LDCs. This demonstrates the fact that FDI and domestic resource mobilizations are not satisfactory due to over reliance on large foreign aid.

While aid in gross capital formation has been unanimously smaller in Ethiopia before 1990s, it turned highest relative to average countries in SSA and LDCs since 1990s. Large aid resources received would be much beneficial to booming investment and growth when utilized for developmental ends.

The growing concessional aid (over 80% grants) and development bank loans reflect the increasing engagement of lenders in such investments as infrastructures in recent years. More than 75% of total aid is delivered in the form of projects to Ethiopia.

Moreover, aid to social infrastructures and services including health and education takes increasingly larger share in total aid to Ethiopia as compared to economic infrastructures. Ethiopia was also among the highly indebted countries benefiting from debt cancellations and rescheduling at different times since late 1990s.

Recent studies consider involvement of many donors in same thematic sector/country as a *fragmented* aid delivery system. Using HHI as a measure of donors' concentration in Ethiopia, economic infrastructure generally had higher index implying better donor harmonization followed by education sector. Presence of few major donors in education sector might have contributed to aid efficiency and better management of its outcomes.

Chapter four is about econometric analysis in which descriptions of model, method of analysis and data sources are provided subsequently. Discussion of econometric results and conclusions are covered in the last section of chapter 4.

CHAPTER 4: ECONOMETRIC ANALYSIS AND POLICY IMPLICATIONS

Introduction

Government is major player in influencing economic productivity and output through its sizable share in consumption, economic policy measures, and public capital expenditures that in turn affects both efficiency and sizes investment rates and economic growth. Therefore, one main purpose of foreign aid is to bridge investment gaps in financing public capital expenditures in process of developments. Moreover, aid is also provided to address human development constraints. Financing education and health services are nowadays recognized as major human development goals both as means and ends to efforts of sustained growth and poverty reductions (Monterrey Consensus, 2002; The Millenium Project, 2005).

However, effectiveness of foreign aid in leveraging economic performances of recipient countries through provision of finance for public infrastructures and capacity building had been subjected to debates.

Ethiopia has adopted a growth and Transformation plan (GTP) (2010-2015) that involves large infrastructure and industry investments by public sector that would rely heavily on foreign borrowings despite low domestic saving mobilizations. This vowed a fear by IMF & World Bank on 'capacity problem' due to possible destabilizing effect of 'large money'

(Bloomberg, 2011). An important concern of increased foreign aid inflows is the possible undesired macroeconomic instability from large aid money expenditure that an economy may not fully absorb. These pressures can further initiate response of increasing real interest rate by monetary policy, and thus leaving contraction of the traded sector of economy (Berg *et al.*, 2010).

The indirect effect of aid on economic growth through impact on factor productivity or other macroeconomic variables is examined using physical capital investments along with foreign aid in economic growth equation. This is particularly alternative practice to the inclusion of squared aid term in recent studies.

4.1. The Model Specification

. The Lucas (1988) developed a growth model with fixed technology parameter (A) and human capital as main growth driver through scaling up of labor productivity. Lucas emphasized a positive external effect of education that forms 'knowledge externality'. According to Romer (1990), such basic representation shows scale effects in *technology* or '*idea'* production function.

Mankiw, Romer and Weil (1992) MRW introduced the role of human capital into the Solow model of exogenous growth model. They also indicated that the A*ugmented Solow model* with human capital could be extended to endogenous growth framework when a non-decreasing return to sum of both capitals is maintained.

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Jones (1996), on the other hand suggested the human capital formation in endogenous growth model with technology/ideas. Human capital per person was considered as "skill or experience in using advanced intermediate goods".

Bernanke and Gurkaynak (2002)(BG) considered an endogenous model from generalized MRW model framework and showed that "the basic estimation framework is broadly consistent with any growth model that admits balanced growth path- a category that includes virtually all the growth models in literature." (Bernanke and Gurkaynak, 2002: 12). They considered a two sector AK type of balanced growth path (BGP) endogenous growth with human and physical capital. This is what distinguishes them as endogenous growth model in addition to the assumption of constant returns. Summary is on *appendix*.

4.4.1. Analytical framework

A utility optimizing household's choices of consumption and savings; firm's profit maximizing choices of resource employments and government's welfare maximizing allocation of public expenditure is considered. The economy as a whole faces aggregate resource constraints or budget constraints in processes of production, consumption and transaction.

Theoretical lines of reasoning and empirical facts are convincing enough to assume that expenditure on education by government is very important in acquiring a desired level of

human capital to support development process. Educational, research and development expenditures are largely borne by public sector in Ethiopia.

My analysis of government's role in economic growth is analogous in many ways with Barro (1988, 1990), and that of human capital is related to Romer (1986, 1990) and Bernanke & Gurkaynak (2002). The aggregate output produced takes the following Cobb-Douglass production function form:

$$Y = AK^\alpha (hL)^\beta K_g^\gamma \quad \text{.. (4.1)}$$

Where Y is aggregate output(Real GDP), **A** is total factor productivity parameter, K_g is aggregate stock of public[infrastructural] capital, h is human capital embodied in individual labor force, L is total labor force, K is private capital stock and parameters **α, β, γ** represent factor elasticity of output to private physical capital, efficiency worker input and public capital. By dividing both sides of equation with L, we express aggregate output (Real GDP) in per-capita terms (y), with the following equality:

$$Y/_L = [AK^\alpha (hL)^\beta K_g^\gamma]L^{-1} \quad \text{.. (4.2)}$$

Taking natural logarithm (ln) of both sides gives the following logarithmic forms of relationships between output growth and factors on the right hand side:

$$ln(y) = ln(AK^\alpha h^\beta (L)^{\beta-1} K_g^\gamma)$$

Further simplification gives the following *log-linear* equation for per-capita output:

$$\ln y = \ln A + \alpha \ln k + \beta \ln h + (\beta - 1) \ln L + \gamma \ln K_g \quad \text{..................... (4.3)}$$

Now, applying total differential (d) to both sides of equation (4.3) above gives the basic per-capita output growth equation that follows in equation (4.4):

$$d[ln(y)] = d[ln(A)] + d[\alpha ln(K)] + d[\beta ln(h)] + d[(\beta - 1)ln(L)] + d[\gamma ln(K_g)].$$

Finally, the following simplified equation (4.4) relates per-capita output growth to the growth rates of right hand side variables:

$$\dot{y} = \dot{A} + \alpha \dot{K} + \beta \dot{h} + \varphi \dot{L} + \gamma \dot{K}_g \quad \text{............................} (4.4)$$

Where, $\varphi = (\beta - 1)$; and variables with dot overhead represents relative changes (growth rates) in respective variables. These mean the growth rates in per-capita output, total factor productivity, stocks of private physical capital, human capital, public capital and labor force. While total factor productivity growth is often considered to be exogenously determined in neoclassical growth models, it could be achieved through developments in human capital, expenditure in research activities, open trade policies and other policy/institutional factors in endogenous growth theories. Openness to trade can help improve competitiveness of export sectors and help technology transfer through importation of capital and intermediate goods.

Economic policies and institutions have also been found significant in explaining most of growth differentials through their impacts on efficiency of resource allocations in some endogenous growth theories. α, β, γ are positive constants (between 0 & 1) that measure the *elasticity* of output with respect to physical private capital, human capital and public

capital respectively. To fix the analysis for this paper, the returns to scale characterizing this basic production function (sum of factor *elasticities*) is hypothesized to be equal to unity ($\alpha + \beta + \gamma = 1$). It is constant returns to scale in per-capita output growth to the three types of capitals considered here (K, h and K_g). The public investment in human capital formation and infrastructure services can improve private sector productivity and rate of technology adoptions in line with endogenous growth theories (see Kalyvitis & Philippopoulos, 2008).

In practice, growth rate in public and private capital is measured by the total investment as percentage of GDP. Growth in labor is also replaced by population growth rate.

Regarding the separate analysis of investments in private and public capital, the study on relative efficiency of unit dollar investments in both public and private sectors may be required. Here, they are considered differently in growth equation simply due to presence of some degree of complementarity between certain public investments in infrastructure and private sector investments. The decision on how resource allocations are made within or across the private and public sectors can have substantive implication on efficiency of total *capital* investments.

The total investments (I) in fixed capital are made from three main sources as commonly studied in investment and aid relationships:

$$I = \Delta\,(K+K_g) = Sd + Aid + PF \quad\text{... (4.5)}$$

Total investment in open economy is composed of domestic saving (Sd), foreign official development assistance (Aid) and part of private capital inflows (PF) that include foreign

direct investments (FDI) and other forms of private inflows. From empirical standpoint, it is helpful to consider the total physical capital together given data availability and scope of the study. Theoretical analysis on two categories of physical capital is to provide analytical ground on channels of aid effect on economic growth through contribution to total capital formation in the economy.

The forms of financing public expenditure could be classified into three broad sources:

i)   Domestic government revenue mainly from various taxes and no-tax earnings

ii) From domestic savings available in private sector

iii) Foreign aid (loans at concessional rate, grants, donations)

The public expenditure of governments could be divided in to two broad categories:

i)   Expenditures on infrastructure and human capital developments (includes education, training, health facilities, agricultural research). Most infrastructure investments provide continuous flow of services and non-rival public goods to private sector.

ii) Public consumption spending on government administrative activities, contribution to social welfare payments, and transfer payments to individuals (government consumption expenditure).

The former type of public expenditure is often termed as 'productive expenditure' that have been invariably found crucial in boosting growth. Human capital is also identified as key factor in growth per-capita income determinant. It has been progressively used in endogenous growth models to account for role of input to development of new products and/or absorbing already available ideas and technologies of production (Barro, 1991).

4.4.2. The Empirical Model

As argued by Levine and Renelt (1992), there are many theoretical frameworks to guide the identification of empirical determinants of economic growth and there is no such single model that encompass all determinants of economic growth.

Aghion and Howitt (2009) showed that determinats of economic growth in developing countries range from basic factors of production to trade openess, change in terms of trade, level of financial developments and nature of government policies or institutions.

Foreign inflow of resources including aid can have a significant role in supporting growth of economy's aggregate output through various channels. Main channels are investments for accumulation of broader capital stock and enhancing productivity through expansion of economic infrastructures and social capital (educational, health and research) largely supported with aid.

The capacities of attracting large foreign direct investments and promoting export sector are affected by economy's quality of institutions and infrastructures. Forward looking governments, better income distribution and strong openness to trade through promotion of entry to international markets were often considered as major factors in the success stories of many East Asian economies (Ray, 1998). Out ward looking economies get easy access to technology through imported capital goods, help promote competitive export sector and improved resource allocations. Review of empirical studies by Harrison (1996) indicated that the various indicators of trade openness utilized tended to show significant positive association between openness and growth.

Total investment rate is used as explanatory variable in second specification by replacing its sources of foreign aid, domestic savings, and other private flows as in the first basic specification. This procedure enables to test different hypothesis about saving-aid, aid-investment and aid-growth relationships as widely provided in macroeconomic impact of aid literature.

Jones (1996) suggested that educational attainment data should represent *"rate of investment in human capital rather than as a human capital Stock" (Jones, 1996:2)*. Educational attainment can be interpreted as a fraction of individual's time spent on accumulating skills.

Expected effect of human capital on growth is positive for a number of obvious reasons: spillover effect, increased productivity of worker and associated reduced fertility, and further "increased investment in both physical and human capital" as a result thereof (Barro, 1991:409).

The analytical framework on study of effect of foreign aid and domestic financing draws largely from Schumpeterian type endogenous growth model of Aghion and Howitt (2009, Chap. 6).

Following the frameworks discussed in section 4.2, log-linear model from *Cobb-Douglas* production function is adopted. It is augmented with foreign aid and domestic saving as the two main behavioral determinants of investment activities as shown in identity from equation (4.5) for change in capital formation. Given the very negligible foreign direct investments (FDI) in Ethiopia, particularly until 1995 (as shown in chapter 3), private

capital or simply FDI is not considered in our empirical model. Thus, the basic empirical economic growth model is specified on the following variables:

$$\dot{y} = f\left(S_d, \text{Aid}, h, \dot{L}, \textbf{OPN}\right)$$

$$\dot{y} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 S_{dt}} + \boldsymbol{\beta_2 Aid} + \boldsymbol{\beta_3 \dot{h}_t} + \boldsymbol{\beta_4 \dot{L}_t} + \boldsymbol{\beta_5 OPN} + \boldsymbol{e_t} \ \ldots\ldots\ldots (4.6)$$

Where; $\dot{y}$ is real per-capita GDP growth rate, and t is time of observation (year). The rate of change in human capital is measured by gross enrollment rate in secondary school (%); change in labor force is measured by population growth rate; **OPN** is trade openness indicator (policy control variable) that earlier studies have identified as determinant of growth; and replaced by fiscal and monetary policy indicator (*Inflation* (INFL) in other estimation; e_t is stochastic error term.

Theoretical relationship between growth rates of population (fertility) and output in the long-run could be negative or positive across countries and for particular country through time (Becker *et al.*, 1994).

Possible adverse effects of foreign aid are through appreciation of real exchange rate, macroeconomic management difficulty, inefficiency of delivery system and inflationary pressure (see Verbeke, 2007; Easterly, 2003, 2006; Birdsall, Kharas, & Perakis, 2011) are also captured in one of model specifications. This is done by including aid variable in growth regression where effect of investment rate is explicitly controlled.

4.2. Data Sources

The econometric estimation is based on annual time series data extending from 1970 to 2011 on aid, real per-capita GDP, domestic saving rate and others. Data are obtained from UNCTAD's (UN agency) statistical database for import and export figure, The World Bank's databases (Global Economic Prospects) for real GDP, WDI for other variables and data from NBE for some missing observations. Internationally comparable data sources indicated above are preferred. Data are carefully selected by cross checking on available sources to ensure reliability and consistency in conclusions when data is extracted from different sources.

The collected data are organized and expressed in rate of change for real per-capita GDP (at 2005 constant prices); net official aid inflows as percentage of GDP (constant 2005 US$) (Aid); change in human capital is measured by gross secondary enrollment rate (EDU). Averages of preceding and next year are taken for some missing data in educational enrollment. Growth in labor force is measured by population growth rate. Trade openness (OPN) is calculated by ratio of trade to GDP (% of export plus import in GDP). Common practice is to measure openness of economy as indicator of economy's level of integration to world trade and development.

Estimation and statistical tests on significance of foreign aid and other economic growth determinants are provided in section 4.4.

4.3. Method of Data Analysis: ARDL to *co-integration*

Autoregressive Distributed lag (ARDL) based *bounds testing* approach to co-integration is employed to test and estimate the level relationships between per-capita GDP growth, foreign aid, gross domestic saving, and others. Co-integration analysis is very important in this study since the exact nature of how foreign aid interacts with growth, domestic savings and other variables has long been subject to empirical debates and lag structure is included to allow for possible lags in aid, savings and economic growth relationships.

ARDL approach of Pesaran and Shin (1998) and Pesaran, Shin & Smith (1999, 2001) is applied. Appropriate selection of order of ARDL, yields 'super-consistent' estimators of ordinary least squares (OLS) in both short- run and long run equations.

The estimates of ARDL are preferred on three accounts for their superior applicability in applied time series estimations. First is that they can reliably fit to studies of relatively small samples. Estimates of both long-run and short-run components can also be obtained simultaneously by addressing the omitted variable bias and autocorrelation problems in data. Thirdly, ARDL model uses dependent and independent variables explicitly (Pesaran *et al.* 1999, 2001; (Narayan, 2004).

It is shown that ARDL based conditional regression continues to "provide valid inference about the co-integration vector relying on normal approximation" whenever differenced X_t is correlated with the regression residual (Hassler & Wolters, 2005,pp.13).

The dynamic Granger causality test within ARDL is made in three steps (Binh, 2010). First, *stationarity* of time series data is tested (ADF and PP unit root tests are employed here). We then proceed to test and estimate long-run relationships between variables. The final step is to test Granger Causality on Error Correction Model (ECM) that involves error correction term from long-run estimation in step 2.

Assumption of serially uncorrelated residuals from the estimated UECM is checked for selection of optimal lag length. Selection of appropriate lag length is then important to ensure the above assumptions. Unrestricted Error correction is estimated as follows: **Zt=** $f(Y_t, \mathbf{X'_{it}})$:

$$\Delta Y_t = \boldsymbol{\alpha'_{ki}} \, \boldsymbol{D_i} + \boldsymbol{\delta_y} Y_{t-1} + \beta X_{t-1} + \sum_{i=1}^{p-1} \boldsymbol{\delta_y^*} \Delta Y_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\beta^*} \Delta X_{t-i} + \boldsymbol{\varepsilon_t} \quad \ldots\ldots\ldots\ldots\ldots\ldots (\mathbf{4.8})$$

Where, Δ shows a once differenced variable. $\boldsymbol{D_i}$ represents vector of appropriate deterministic terms such as intercept, trend or dummy variables and $\boldsymbol{\alpha_{ki}}$ are coefficient vectors of corresponding deterministic terms. δ_y, $\boldsymbol{\beta}$, $where\ \boldsymbol{\beta} = \beta_1, \beta_2, \ldots\ldots, \beta_k$ are long-run (parameter) estimates of lagged level variables of Y_t , $X_1, X_2......X_k$ respectively. The Bounds test is undertaken to test the following hypothesis:

$$H_0: \boldsymbol{\delta_y} = \beta_1 = \beta_2 = \cdots = \beta_k; against\ alternative\ H_1: \boldsymbol{\delta_y} \neq \mathbf{0}\ \boldsymbol{and}\ \beta'_1 s$$

$$\neq 0\beta_2\ or\ \boldsymbol{\delta_y} \neq 0, but\beta'_1 s = 0\ and\ vice-versa$$

The bounds test is made by comparing F- statistic from *exclusion* restrictions with asymptotic *critical bound values* tabulated in Pesaran *et.al* (1999, 2001) for various cases of deterministic components, number of regressors and 'reasonable' sample size.

Using Annual data of Ethiopian economy, the ARDL based tests for existence of level relationships is undertaken before estimation of static relationships.

4.4. ECONOMETRIC RESULT AND DISCUSSIONS

4.4.1. The Unit Root Tests

Before running the standard regression analysis and inference, it is common a practice to check whether individual data series is *stationary* to avoid possible misleading regression output of OLS based estimation in time series studies.

Engle & Granger (1987) suggested: "if each element of a vector Y_t time series achieves stationarity after differencing, but a linear combination $\alpha'X_t$ is already stationary, the time series x_t are co-integrated with vector of α".

The unit roots analysis is presented using two tests: Augmented Dickey Fuller (ADF) and Phillips-Perron(PP). If the ADF and PP test statistics are greater than the critical statistics provided, the null hypothesis is rejected and time series is stationary. An inability to reject the unit root hypothesis shows that the series is non-stationary at level.

The Null hypothesis is that Y_t (time series) has unit root (it is non-stationary).

Table 4: 1 ADF and PP Unit root test results

Variable	Augmented Dickey Fuller (ADF) Tests			Phillips – Perron (PP) Test	
	Level Yt t_c	Level Y_t t_{ct}	ΔY_t (1) t_c	Level Y_t t_{ct}	ΔY_t (1) t_c
$\dot{y}$	-2.2530(2)	-5.07 (1)***	-5.2068 (4)**	1.701(5)	-3.948**(0)
Sd	-3.101(2)**	-3.17486(2)	-8.4527(0)***	-3.20232(1)*	-8.5183(4)***
Aid	-2.4645(0)	-2.46253(0)	-7.318(0)****	-2.42168(2)	-7.3707(2)***
Δ(EDU)	2.1930(0)	-2.3956(0)	-3.0462(1)	-2.57391(6)	-10.045***
OPN	-0.0282(0)	-1.89212(0)	-6.0124(0)***	-2.02132(2)	-6.006(4)***
POPG	-2.922(4)*	-8.27(8)***	-3.1689(8)**	-1.69541(4)	-2.5606(3)
INV	-0.6676(1)	-2.5932(0)	-8.0920(0)***	-2.54793(2)	-8.0709(0)***
INFL	-2.2161(2)	-2.23761(2)	-8.9009(1)***	-5.033(4)***	-11.106(4)***

Value in (...) Shows order (m) of lagged differenced series selected automatically by Akaike Information Criteria (AIC) in regression of respective time series for unit root test ($\Delta Y_t = c_0 + \gamma t + \beta Y_{t-1} + \sum_{i=1}^{m} \varphi \Delta Y_{t-i} + u_t$); ***, **, * show highly significant test statistics at 1%, 5% and 10% respectively. t_c represent test statistics with intercept (c) and t_{ct} includes intercept and trend (t) in unit root test equations.

The tests show that most of the series are non-stationary at levels, except the $\dot{y}$ stationary at 5% in ADF, and INFL is non-stationary in PP test at 1% significance level.

The tests confirm that all variables except EDU are stationary after differencing once-I(1). Educational attainment variable (EDU) becomes stationary after differencing twice (ΔEDU (1)) though it does not alter conclusion on the co-integration. Thus we keep level variable (EDU) in estimation for meaningful economic interpretation. Data dynamics are analyzed in next section to search for extreme outlier observations.

4.4.2. Overview of Data

Figure 4: 1 Graphical inspection of different data for outliers
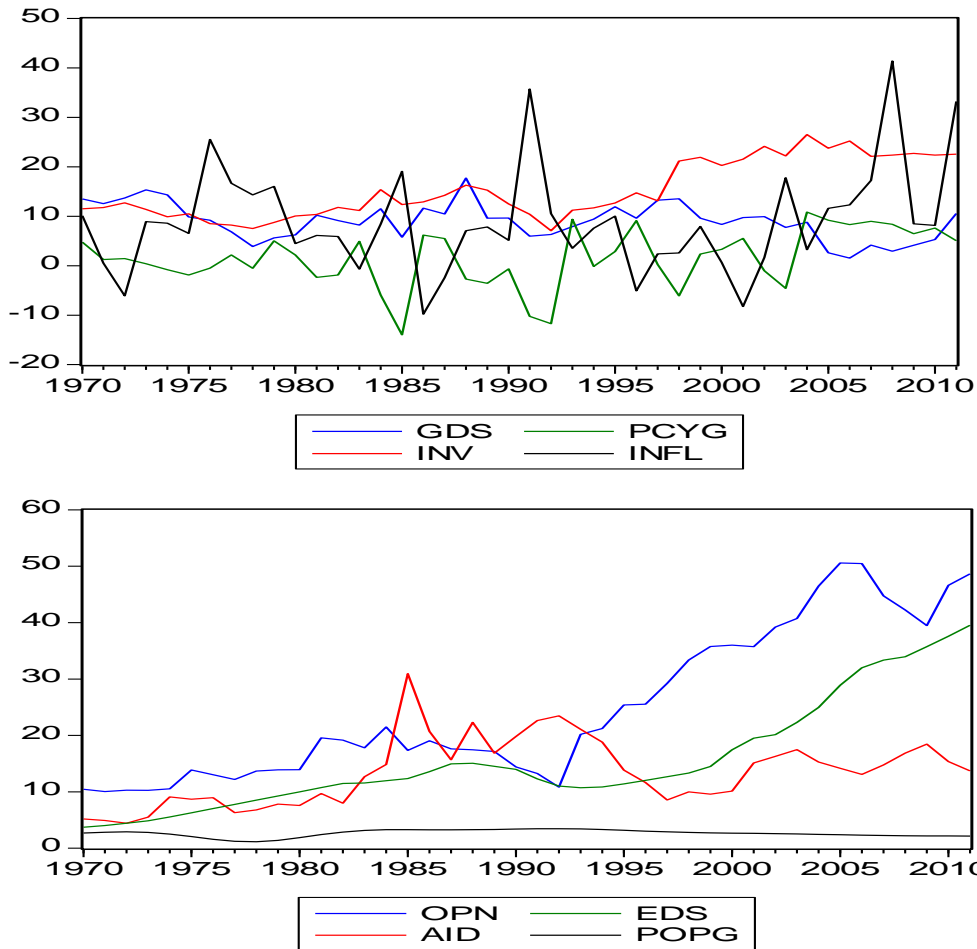
(Note: *PCYG represents per-capita GDP (ÿ) here for recognizable notation to software*)

The graphical illustration suggests that there had been unexpected external shocks that have greatly resulted in outlier data observations. The years 1991, and 1992 had been years of high political instability and regime change in Ethiopia. The year 2003 was year of weather related incidents and border related war with Eritrea; and 2008 is major global

financial crisis that had implication on Ethiopia. These major natural, political and economic events are accounted for with dummy variable as follows:

Dww: is a *dummy* variable to represents *war* and *weather* related crisis, taking value **1** for 1981-82 debt crisis, 1984-1985 drought incidence, 1991-92 domestic political instability that overthrew socialist regime, 2002-2003 (bad weather and border wars), and 2008 (global Financial crisis); and taking value **0** for the remaining years.

4.4.3. Tests for Co-integration: ARDL Bounds Test

ARDL (p,q) approach in this study proceeds by estimating *unrestricted* ECM through Ordinary the Least Squares (OLS) regression techniques: Accordingly the conditional unrestricted ECM for our variables in growth function is constructed as follows to test for co-integration:

$$Z = f(\dot{y}, Sd, Aid, EDU, \dot{L}, OPN)$$

Where, **Z** is set of variables used, per- capita income growth ($\dot{y}$) and its determinants.

1. $\dot{y} = f_{\dot{y}}(\dot{y}/Sd, Aid, EDU, \dot{L}, OPN)$

$$\Delta \dot{y}_t = \alpha'_{1i}D_i + \delta_y \dot{y}_{t-1} + \beta_1 Sd_{t-1} + \beta_2 Aid_{t-1} + \beta_3 EDU_{t-1} + \beta_4 OPN_{t-1} + \beta_5 \dot{L}_{t-1} + \delta_y^* \Delta \dot{y}_{t-1}$$

$$+ \sum_{i=0}^{q-1} \beta_{1i}^* \Delta Sd_{t-i} + \sum_{i=0}^{q-1} \beta_{2i}^* \Delta Aid_{t-i} + \sum_{i=0}^{q-1} \beta_{3i}^* \Delta EDU_{t-i} + \sum_{i=0}^{q-1} \beta_{5i}^* \Delta \dot{L}_{t-i}$$

$$+ \sum_{i=0}^{q-1} \beta_{4i}^* \Delta OPN_{t-i} + \varepsilon_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.9)$$

2. $S_d = f(\text{Sd}/\dot{y}, \text{Aid}, \text{EDU}, \dot{L}, \text{OPN})$

$$\Delta \boldsymbol{Sd}_{yt} = \boldsymbol{\alpha}'_{2i}\boldsymbol{D_i} + \boldsymbol{\delta}_{gds} Sd_{t-1} + \beta_1 \dot{y}_{t-1} + \beta_2 Aid_{t-1} + \beta_3 EDU_{t-1} + \beta_4 OPN_{t-1} + \beta_5 \dot{L}_{t-1}$$

$$+ \sum_{i=1}^{q-1} \boldsymbol{\delta}^*_{gds} \Delta Sd_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\pi}^*_{1i} \Delta \dot{\boldsymbol{y}}_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\pi}^*_{2i} \Delta Aid_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\pi}^*_{3i} \Delta EDU_{t-i}$$

$$+ \sum_{i=0}^{q-1} \boldsymbol{\pi}^*_{4i} \Delta OPN_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\pi}^*_{5i} \Delta \dot{L}_{t-i} + \boldsymbol{\varepsilon}_{2t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.10)$$

3. **Aid= f_Aid(Aid/PCYG, GDS, EDU, OPN, POPG)**

$$\text{Aid} = \boldsymbol{a}'_i \boldsymbol{D_i} + \delta_{Aid} Aid_{t-1} + \beta_1 \dot{\boldsymbol{y}}_{t-1} + \beta_2 Sd_{t-1} + \beta_3 \dot{\boldsymbol{h}}_{t-1} + \beta_4 OPN_{t-1} + \beta_5 \dot{L}_{t-1} + \delta^*_{Aid} \Delta Aid_{t-1}$$

$$+ \sum_{i=0}^{q-1} \boldsymbol{\varphi}^*_{1i} \Delta \dot{y}_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\varphi}^*_{2i} \Delta Sd_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\varphi}^*_{3i} \Delta \dot{\boldsymbol{h}}_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\varphi}^*_{5i} \Delta \dot{\boldsymbol{L}}_{t-i} + \sum_{i=0}^{q-1} \boldsymbol{\varphi}^*_{4i} \Delta OPN_{t-i}$$

$$+ \varepsilon_{3t} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4.11)$$

Where, $\boldsymbol{D}_{it}$ is vector of deterministic terms, including intercept and dummy variable; $\boldsymbol{\alpha}_i$'s are the associated vector of coefficients; $\boldsymbol{\varepsilon_t}$ is serially uncorrelated random error term with zero mean and constant variance(*white noise*) and other variables are as defined earlier.

4.4.4. Optimal Lag selection and Co-integration Tests Results

To proceed with the bounds test procedure, optimal lag length associated with ARDL (p, q) is selected based on information criteria and series of diagnostic tests by starting from maximum lag length of 2 for each variable down until robust model is specified.

To reduce the over parameterization bias in small data, flexible lag length selection is adopted through general to specific modeling approach to arrive at model with less number of estimated parameters. Thus, degree of freedom is balanced. We start from lags (2,2) and reduce very insignificant parameters using significance test on coefficients.

Table 4: 2 Parsimonious Optimal lag length selection

ARDL ($\dot{y}$,Sd, Aid, EDU, OPN, POPG)	AIC	SC	$X^2_{SC}(1)$	$X^2_{SC}(4)$	df
ARDL(2, 2, 1, 1, 2, 1)	-4.17132	-3.66465	0.99189	1.210642	**28**
ARDL(1, 1,1,1 1, 1)	-3.87719	-3.45925	0.13210	1.693265	31
The AIC & SBC indicate that this final parsimonious UECM model is best and has minimum information criteria. There is no residual Serial correlation problem - one main criteria for co-integration analysis					

    i)   ARCH$_{(3)}$= 0.72186; JB =0.3608; RESET test = 1.1694 (*first model with 2 lags*)

    ii) RESEST = (2.933434)**; Normality (JB)= 5.9695* (second model with 1 lag)

The first model with the stated optimum lag lengths passed all model specification tests. However, model on the second list (with maximum lag length of 1 in the table 5.2) has lower information criteria (both AIC and SC) for selection of lags. However, it could not

pass functional specification test (RAMSEY RESET test) and normality test (Jarque Bera). This indicated that lag 1 is not the correct functional form for our output growth model and model with maximum of two lags is adopted for testing and estimation of long-run relationships. The parsimoniously estimated model for co-integration finally has 28 degree of freedom.

The final empirical model passed diagnostic tests with 28 number of degree of freedom corresponding UECM regressions of equations 4.9 and 4.11(output growth and domestic saving models), 29 for equation 4.10. Then the long-run co-integration tests are applied as follows. Wald test statistics for testing presence of co-integration in UECM model are reported below:

Table 4: 3 Bounds F-Statistics on co-integration from UECM

Function	With Trend		Without Trend		
	F_V	F_{IV}	F_{III}	df	Co-intgra.
F_y[....]	16.9295	14.654	....	28	YES [ ]***
F_{Sd}[....]	5.2808	4.564		29	Yes [ ] **
F_{Aid} [....]	...	...	5.91572	28	YES[ ]***

** and **** show significance of tests at 5% and 1% significance levels respectively(co-integrated); f_y**[...]**, F_{Sd}[....] and F_{Aid}[....] are co-integration equations corresponding to the variables considered as dependent variables.*[df=degree of freedom]*

The null hypothesis of *no co-integration* is rejected when F-statistics is greater than upper critical bounds tabulated in Pesaran *et al.*(2001)(adopted in table 4.4 on *appendix*).

There is co-integration relationship in growth function. The F-test statistics is greater than upper bounds critical values in growth equation at 1% significance, thus rejecting the null hypothesis of no long-run relationship against the alternative of at least one *degenerate* long-run relationship among economic growth, foreign aid, domestic savings and others regardless of order of integration for each series.

There is some evidence of co-integrating relationship in aid function since the null hypothesis is rejected at 5% significance level in preferred model, irrespective of deterministic trend specification. Therefore, it is important to analyze causality in variables of interest- foreign aid and gross domestic saving equations if both variables interact with each other.

4.4.5. Estimation of Long-run relationships in Growth Equation

Having found that there is a long-run level relationship between real per-capita output growth and its determinants, the estimation and inference about the long-run elasticity is performed using general to specific approach. The long-run estimates are obtained from ARDL based unrestricted error correction model corresponding to the parsimoniously specified empirical equation.

Necessary diagnostic misspecification tests are applied to specify a parsimonious model using "general to specific" approach of Hendry (1995). This is appropriate methodology suggested to reduce over parameterizations in estimations to arrive at more reliable inference particularly when data is small.

ARDL based estimation of Long-run relationships

$$\dot{y} = 0.6162 \text{ Sd} + 0.36061 \text{ Aid} + 0.10298 \text{ EDU} - 0.3092 \text{ OPEN} - 1.6884 \text{ POPG} - 0.0443$$

  (-3.668)*** (-2.805)*** (-0.807) (3.705)*** (1.747)*** (2.265)**

R-square = 0.8996; Adj. R-square=0.8602; Prob(F-statistic) = 0.000000

Values in **(...)** are *t*-statistics; and *** and ** show that the corresponding estimated long-run coefficients are statistically significant at 1% and 5% significance levels respectively.

Model Diagnostic Tests

Normality (JB) = (0.3608); LM (1) = 0.992; LM (4) = (1.210642); ARCH$_{(3)}$= (1.210642); functional form misspecification (Ramsey RESET(3) test = (1.169366); CUSM-square test for multiple structural break also do not reject constancy of variance over time at less than 5% significance level(the graphical recursive estimate is provided in appendix). In general the model passes major model diagnostic tests at 1% significance level.

Estimated coefficients on variables have expected sign and statistically significant except that the trade openness indicator has significant negative coefficient and estimate for educational enrollment is insignificant despite its positive coefficient. The role of aid in boosting economic growth is through its growing importance in financing investment activities as supplement to domestic savings. The result is robust and its positive

contribution to per-capita income growth is relatively smaller than estimated coefficient of gross domestic savings.

Effectiveness of aid is also statistically strong and increase in net aid flows by 1% of GDP can translate into average real per-capita GDP growth of about 0.36% in Ethiopia. However, the estimated coefficient of gross domestic saving is higher than 0.6 and highly significant at 1% level. It also suggests that an additional 1 % in GDP of domestic saving will pay off about 0.61 % growth in per-capita GDP in long-run through its cumulative multiplier effects of capital formation. Positive growth effect of aid is consistent with more recent empirical studies indicating strong positive effect in good macroeconomic stability conditions. Durbarry *et al*.(1998) found strong positive effect of aid on average economic growth of 68 aid recipients both in cross section and panel data (1970-1993) estimations, when aid and domestic savings were separately included.

The fact that all aid is not used for investment purposes may have reflected the lower contribution of foreign aid to growth. Indeed, it is more likely that aid is used partly for other purposes as well. Peterson (2007) found evidence for *fungibility* of sector-specific aid in estimates for 57 individual countries.

The impact of aid on growth through filling investment gaps is about half of the growth contribution of counterpart domestic savings. Even though net aid inflows have been very large relative to total investments (as seen from chapter 3), aid contributes to per-capita growth by much less than domestic savings do. One reason for this is that not all aid

inflows are directed in to expenditure on physical capital formation. Large aid has been directed to social service sectors (education, health, and other general purpose uses) that has to support growth indirectly. It has also been the case that much aid supports poverty reduction activities which may not have an equal multiplier effect on income growth as domestic savings in creating a cycle of further savings and investments.

To the contrary, it may be possible that reliance on aid can result in low domestic saving efforts. Elbadawi & Mwega (2000) found an inverse relationship between gross national saving rate and foreign aid for average countries in Sub-Sahara Africa during 1970 -1995. They reported strong correlation coefficient between saving and investment while lowest between aid and investment. In this aspect our study is largely consistent with their result in finding much stronger contribution of domestic saving to economic growth than aid in Ethiopia by serving as main source of investment.

The finding here is supported with large empirical consensus that aid gives support to recipient economies, despite unresolved issue on how to make aid more effective in different countries' circumstances (Hansen & Tarp, 2000). Guillaumont & Chauvet (2001) also confirmed that aid is particularly more effective in countries where aid is provided during situations of external shocks such as unpredicted climatic change and fluctuations in export earnings.

Furthermore, short run analysis supports that long-run growth effect of foreign aid is much influenced by the extent of its productive uses in short-run. Proper management of

possible destabilizing effect of large aid money expenditure is important to optimize its long-term supply side contributions. The foreign aid had some negative effect on rate of growth in short-run as depicted in the next section.

4.4.6. Dynamic short-run relationships: Granger Causality Analysis

The Standard Granger Causality analysis (Granger, 1988) states that once co-integration is confirmed there must exits at least one way causality between co-integrating vectors. X is said to granger cause Y if the values of X_t provide useful information in predicting the values of Y_{t+1}.

After estimation of long-run relationships in growth equation, the dynamic short-run relationship is estimated by including the lagged error term from long-run estimation. The dynamic ECM shows a change in per-capita GDP growth in response to two factors. One is the short run change in explanatory variables and second is lagged deviations of dependent variable from its equilibrium. Granger Causality also serves as double check on co-integration. The following ECM is estimated:

$$\Delta \dot{y}_t = c + \sum_{i=1}^{p} \varphi_1 \Delta \dot{y}_t + \sum_{i=0}^{p} \varphi_2 \Delta Sd_{t-i} + \sum_{i=0}^{p} \varphi_3 \Delta Aid_{t-i} + \sum_{i=0}^{p} \varphi_4 \Delta \dot{h}_{t-i} + \sum_{i=0}^{p} \varphi_6 \Delta POPG_{t-i}$$

$$+ \sum_{i=0}^{p} \varphi_5 \Delta OPEN_{t-i} + \mu ECT_{t-1} \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots . (4.13)$$

In the language of Granger Causality, significance and size of $\boldsymbol{\mu}$ shows the adjustment speed of $\dot{\boldsymbol{y}}_t$ to its past deviation from equilibrium.

Table 4: 4 Dynamic relationships: Economic growth, Domestic savings & Aid

Dependent Variable: D($\dot{y}$)		Included observations: 39 after adjustments			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**	Joint (F-test)
C	0.014495	0.010932	1.325977	0.1949	
DWW	-0.060874	0.017301	-3.518439	0.0014***	
D(AID)	-0.319637	0.182923	-1.747388	0.0908*	
D(Sd)	0.169295	0.230009	0.736037	0.4674	
D(EDU)	2.532722	0.789592	3.207633	0.0032***	
D(OPN(-1))	-0.530564	0.239954	-2.211104	0.0348**	
D(OPN(-2))	0.350081	0.240727	1.454266	0.1563	
D(POPG(-1))	2.745961	3.700990	0.741953	0.4639	
ECT(-1)	**-0.476917**	0.082014	-5.815068	**0.0000*****	
R-squared = 0.7306 F-statistic = 10.1723					
Adj. R-squared = 0.6588 Prob(F-statistic) = 0.000001					
Log likelihood = 73.299 Durbin-Watson stat = 2.093					
Δ is differenced values of each variable in ECM regressions; ***, ** and * show that the estimated coefficients are significant at 1%, 5% and 10% significance levels respectively.					

Diagnostic Tests: On the Above model

LM (1) x^2_{autoc} = (0.2726) p-value=0.6055; LM(4) x^2_{autoc}= (1.7837) p-value= 0.16242;

Normality JB= (4.5271), p-value= 0.10397; ARCH(3)= (0.8254) p-value= 0.4896.

Ramsey RESEST (3)test = (2.010), Chow Test (1992) = (1.5668).

The causality and short-run analysis also reconfirms the long-run relationship based on the negative and highly significant coefficient of error correction term. Change in gross domestic saving has positive but insignificant effect on rate of output growth in short-run. Effect of change in foreign aid on rate of output growth is negative and significant at 10% significance level in short-run. Causality runs from aid to growth. However, the short-run effect of domestic savings is insignificant which may make sense from economically as current saving rate needs to be invested before it can be translated to growth and may take least two year lags. Trade openness also significantly increase per-capita income growth in short run, whereas the effect of population growth is positive but statistically insignificant in the short-run.

Change in educational enrollment contributes positively to growth significantly in short run. The coefficient of lagged ECT implies that per-capita output growth corrects about 47% of its past deviation from equilibrium within one year. This is relatively high speed of adjustment in output growth towards long-run equilibrium level. A further analysis for on indirect effect of aid on economic growth is provided in next section where level of investment channel is included with foreign aid in growth equation.

4.4.7. Estimation of growth equation with Investment and Inflation

We now turn to estimate the effect of aid economic growth by controlling level of investment rate and explore other possible channels through which it affects economic

growth. In this specification, rate of capital formation is replaced by total investment rates instead and aid is included to examine its effect on growth through other mechanisms apart from investment channels. The inflation rate is also included as one indicator for strength of macroeconomic management instead of trade policy variable.

The second main estimation on economic growth is on the following variables:

$$\dot{y}_t = f(INV_t, Aid_t, EDU, POPG_t, \mathbf{INFL}_t),$$

Where $\mathbf{INV_t}$ is investment to GDP ratio (gross fixed capital formation at constant price); INFL represents inflation rate and other variables are as explained earlier. Inflation is taken as key macroeconomic policy indicator.

Co-integration tests of economic growth with investment and Aid

Table 4: 5 Co-integration tests: Economic growth, investment and aid

Function	With Trend			
	$\mathbf{F_{VI}}$	$\mathbf{F_{II}}$	df	Co-integration
$\mathbf{F\dot{y}[....]}$	...	15.86857	28	Yes
$\mathbf{F_{INV}[....]}$	5.655648	....	28	YES
	Without Trend		**df**	Co-integration
$\mathbf{F_{Aid}[....]}$	F_I	10.37631		Yes

Source: Computation from software

The above co-integration test statistics confirm that there is co-integration relationship among per-capita output growth, investment rate and aid inflows despite non-stationarity

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of each variable at level, and estimation of long-run level relationships is meaningful. Estimation of these relationships is provided in next section.

Long-run growth Equation with investment rate

Part of positive growth effect of aid through investment channel seems to have been offset by the macroeconomic challenges associated with increased aid in line with the widely documented recent studies. In growth specification with level of investment, an increased aid had some negative effect on growth *albeit* statistically insignificant.

The estimated economic growth equation is below:

$\dot{y}$= 1.861 + 0.5188 INV – 0.0182 Aid + 0.3655 EDU – 0.2192 POPG – 0.34594 INFL

(-0.46871) (-2.20496)** (0.12250) (-2.6755)** (0.14666) (3.1227)***

R^2= 0.914149; LM(1)= 0.026410; LM(4)= 1.275624; RESET(3)= 1.206402; ARCH(3)= 0.448524; Normality JB= 0.051609, RESET Test = 1.2064; Chow Test= 2.21107

The above estimated coefficients have their theoretically expected signs; particularly the effect of human capital formation (as measured by educational enrollment rate) becomes significant when investment is explicitly included than in separate aid and gross domestic saving specifications of earlier model. When level of investment is held constant in current growth equation, the estimate of aid on growth has negative sign but insignificant.

The above estimation also re-confirms that aid positively promotes economic growth of Ethiopia mainly by filling domestic saving gaps in financing investments as main channel. It also indicates some indirect challenges that aid poses through other channels.

4.5. Conclusion

Researcher attempted to develop a comprehensive econometric model that handled both the direct contribution of foreign aid to economic growth and role of domestic saving in the same model. In addition, framework for estimating indirect channel through which aid may affect economic growth is considered by estimating coefficient of aid by keeping level of investment in economic growth. Accordingly, time series data from 1970-2011 is used to test and estimate long-run relationships using ARDL model.

The unit root and co-integration tests were made before estimation of level relationships between real per-capita GDP growth and other variables. The co-integration tests found long-run relationships among the variables. Both domestic savings rate and foreign aid have positive effects on long-run economic growth with statistically significant estimates. However, the short-run effect of change in aid has statistically significant negative effect on growth rate.

Furthermore, controlling for investment level, the estimated coefficient of aid in long-run output growth turns negative though statistically insignificant. This indicates that large aid poses some indirect challenges in macroeconomic management or causes unhealthy competition over its redistribution. These factors might have sustained bad institutions or delayed necessary reforms and limited improvements in economy's productivity.

The short-run effect of gross domestic saving on per-capita output growth is positive but statistically insignificant. This means that it takes more years for aggregate savings to be transferred to productive investments than aid. It also implies presence of weak domestic saving mobilization effort and linkages between supply and demand for loanable funds in financial markets. On the other hand, domestic saving has much larger [about twice] marginal effect on growth than aid in long-run despite large investment gaps filled by foreign aid. This implies that development aid is not properly utilized for productive investments in public infrastructure or aid allocation decisions are inefficient. It may also imply presence of absorptive capacity constraints in using large aid money.

An effort to increase financial sector efficiency and promoting relationships between real sector investors and financial sector seem to be fruitful than much reliance on aid.

4.6. Limitation of the study

The researcher has attempted to address the research question on understanding relative role of foreign aid and domestic savings in economic growth of Ethiopia. The available data on aid and macroeconomic variables were annual time series that may be relatively small to apply more comprehensive estimation with extended number of variables and lag structure.

Even though many researches have recently used the same econometric model (ARDL model) with fewer time series data, the nature of data in this research seems to fluctuate much and makes the accurate estimation likely more difficult. The researcher is aware of this issue and attempted to reduce estimated parameters by using an approach of excluding very insignificant parameters. Moreover, econometric analysis is supplemented with separate detailed analysis of foreign aid, domestic saving, investment trends and FDI to increase reliability of information and conclusions from the study.

To make better application of econometric estimation framework developed in the study, the researcher hopes to utilize it in future studies by extending to panel dataset so that larger observations would be made available.

CHAPTER 5: CONCLUSION AND RECOMMENDATION

5.1. Conclusion

There have been many controversies on extent of aid contribution to economic growth and poverty reductions. Project based case studies have often reported substantial positive impacts of aid on economic objectives and poverty efforts while macroeconomic effects remained area of controversies. Many theoretical discourses followed some of the doubts on macro level effects. Mosley (1987) observed 'seemingly contradictive' project based and macroeconomic level studies that he named "Micro-Macro Paradox".

Part of the empirical debates were due to study related problems in estimation of aid coefficients in growth, saving or investment regressions. Some useful insights, however, have emerged from such studies. These include aid 'fungibility' (switching away of domestic resources from productive uses), some undesired consequences on prices, real exchange rate, challenges to developments of sound institutions; and effectiveness of fiscal and monetary policies.

It has been widely recognized that aid by itself is not enough. The nature of policies of government expenditure, resource mobilization efforts, export sector development and macroeconomic stability are important in aid effectiveness. Current practical policy level

challenges are the issues of increased transaction costs and inefficiency loss from aid fragmentation, volatility, and less alignment with development priorities.

In general, it is expected that aid supports public sector's development capacity buildings by supporting various productive investments in presence of strong governance, effective macroeconomic policies, and better resource utilizations (Harms & Lutz, 2004; United Nations, 2008).

This study is motivated by the fact that Ethiopian overall economic development effort has been encouraging and yet the country remained among the top aid recipients where aid on average is more than twice of domestic saving rates (OECD, 2011; Chapter 3). Domestic 'tax efforts' have been weak relative to average developing country standards, despite recent slight improvements.

Therefore, it appears important to clarify relative importance of increased reliance on foreign aid in relation to domestic resource mobilizations as a growth enhancing strategy in Ethiopia. This is study attempted to analyze trends and interrelationships among economic growth, investments, domestic saving and aid flows to Ethiopia.

5.1.2. Role of foreign capital in Domestic Investments

Capital formation in Ethiopia's recent robust economic growth has been significant, in which investments have taken an average of about 24% in GDP over the past 11 years. However, domestically mobilized savings had been less than 7% of GDP on average

which represents significant gap between domestically mobilized savings and investment activities. The gaps during each year had been more than two third of total investment rates which in turn had been nearly two and half times the average domestic savings. Obviously such large saving - investment gaps have been bridged with various forms of resource inflows.

When compared with high aid receiving country groups like HIPCs, LDCs, and SSA, Ethiopia received largest aid relative to its GNP in recent years. Aid relative to gross capital formation has also been increasing in Ethiopia compared to the other groups since 1990s. However, foreign direct investment (FDI) in Ethiopia had been very small for long period of time.

The finding provides a conclusion that Ethiopia had less diversified capital formation efforts than average Africa and LDCs groups for long period of time. This is supported with fact that both FDI and domestic resource mobilizations are not at satisfactory level.

Social infrastructures and services such as health and education have been taking increasingly larger share of aid relative to economic production and infrastructure sectors. Such large aid resources could be beneficial to recent investment booms in supporting ongoing developmental activities when its utilization is carefully made.

5.1.3. Relative significance of aid and domestic savings

The role of aid in boosting economic growth is positive and significant that reconfirms its growing importance in financing investment activities as supplement to domestic savings.

The result is robust and economic growth contribution of aid is relatively smaller than that of gross domestic savings.

Effectiveness of aid is statistically strong and an average 1% of GDP increase in net aid helps an average real per-capita GDP growth of about 0.436% in Ethiopia given other factors. The estimated coefficient of gross domestic saving is higher than one and highly significant at 1% level. It suggests that a 1 % of GDP in domestic saving will pay off about 0.61 % growth in per-capita GDP in long-run through its cumulative multiplier effects. The fact that all aid is not used for investment purposes and its some perverse impact on macroeconomic stability may have offset its contribution implied in lower estimated impact.

Even though aid inflow had been larger than total investments, it contributes to income growth by much less than domestic savings do. Other probable reason could be due to the fact that growing proportion of aid has also been directed to social service sectors and this is partly controlled by effect of human capital formation in estimation. It has also been the case that aid has been spent on poverty reduction activities which may not have an equal multiplier effect as domestic savings.

Furthermore, a short run analysis supports the argument that long-run growth effect of foreign aid depends much on how the increased savings is used for further productive uses. Short run growth effects of both aid and domestic saving are realized after two year lags. Adjustment of per-capita output growth towards long-run equilibrium relationships is relatively fast.

Further estimation of growth equation by controlling for investment rate gave negative coefficient estimate on aid albeit statistically insignificant.

In general, even though there has been investment uses of foreign aid, such aid financed public projects are either less efficient than the investments from domestic savings and/or there had been absorptive capacity problems that created certain distortions in economy and lower efficiency of aid. It may also indicate possible undesired resource competition over the 'rents created in resource allocations' among the groups having control on aid in economy.

5.2.   Policy Recommendations

Some important policy and further research implications that emerge from this study are briefly forwarded as follows:

- Possible ongoing institutional and policy efforts need to be strengthened in order to improve FDI flows and domestic investment efforts.

- Policy makers should pay attention to the low domestic saving trends of recent years and have to work better on mobilization of domestic capital and financial market developments to encourage corporate and household savings and public revenue.

- While the inflow of foreign aid has statistically significant positive effect on growth, its relative contribution is lower than the effect of domestic savings. When the channel of investment contribution is controlled, aid has some negative effect on

growth (but statistically insignificant) which indicates the associated macroeconomic challenges of effectively utilizing aid. Thus, it appears that better management and coordinated use of foreign aid is needed to optimize growth benefits of large inflows.

- Proper prediction of aid flows and necessary fiscal and monetary adjustment rules need to be pursued to ensure that fluctuations of aid do not cause large absorptive capacity constraints and undesired effects with large money circulation in economy. This is important to reduce the likely inflationary pressure from aid, since inflation has large negative effect on capital formation/investment rates.

- Further study can give insights on why private sources of investments have been low in Ethiopia by emphasizing on determinants of domestic resource mobilizations and foreign private capital inflows.

Appendices

1.1. Lucas Model of Economic Growth:

$$Y = AK^{\beta}[u_t hL]^{1\text{-}\beta} (h_a)^{\gamma}$$

Where, A is considered as externally fixed technology parameter; h is skill or human capital of each worker and u is proportion time spent on production of output; h_a is average level of skills. U=time spent on production, with h human capital (skill level), with L labor, effective skill adjusted labor is uhL=N, h_a =is average skill level.

1.2. The Mankiw, Romer and Weil (MRW) (1992) growth model:

$$Y_t = K^{\alpha}H^{\beta}[(A)L]^{1-\alpha-\beta}$$

Where, they assumed a decreasing returns to both forms of capital, so that $\alpha+\beta<1$. (i.e $\alpha+\beta=1$) in this case (pp. 421).

1.3. They extended the generalized MBW framework in to their version of endogenous growth model (Uzwa-Lucas) of the following:

$$Y_t = K_t^{\alpha}[Z_t u_h L_t]^{1-\alpha}$$

Where, they consider Zt, of 'technology index' or simply labor productivity accumulated through a process of "learning-by-doing" and human capital accumulation. Where it is a 'composite function' of technology parameter or ideas (A), human capital and share of labor time spent on producing *idea*; u_h is share of labor time spent on producing output.

Table 4: 6 UECM for Lag length Selection: AIC, SC and serial correlation tests

Dependent Variable: D(PCYG)

Included observations: 40 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.059036	0.026065	2.264959	0.0314
DWW	-0.073666	0.011129	-6.619302	0.0000
PCYG(-1)	-1.329973	0.154076	-8.631904	0.0000
GDS(-1)	-0.819546	0.223438	-3.667890	0.0010
AID(-1)	-0.479611	0.170964	-2.805342	0.0090
EDS(-1)	-0.136971	0.169799	-0.806669	0.4267
OPN(-1)	0.347582	0.093823	3.704661	0.0009
POPG(-1)	2.245592	1.285625	1.746692	0.0917
D(GDS(-1))	0.521875	0.187014	2.790567	0.0094
D(PCYG(-1))	0.214291	0.099066	2.163107	0.0392
D(AID)	-0.558724	0.137689	-4.057877	0.0004
D(OPN(-1))	-0.523631	0.173390	-3.019962	0.0053

R-squared	0.899620	Adjusted R-squared		0.860185
Durbin-Watson stat	2.298542	Prob(F-statistic)		0.000000

Normality (JB) = (0.3608); LM (1) = 0.992; LM (4) = (1.210642); $ARCH_{(3)}$= (1.210642); RESET test(3)= (1.169366)

Figure 4: 2 Recursive CUSUM-square tests in long-run growth with domestic saving and aid
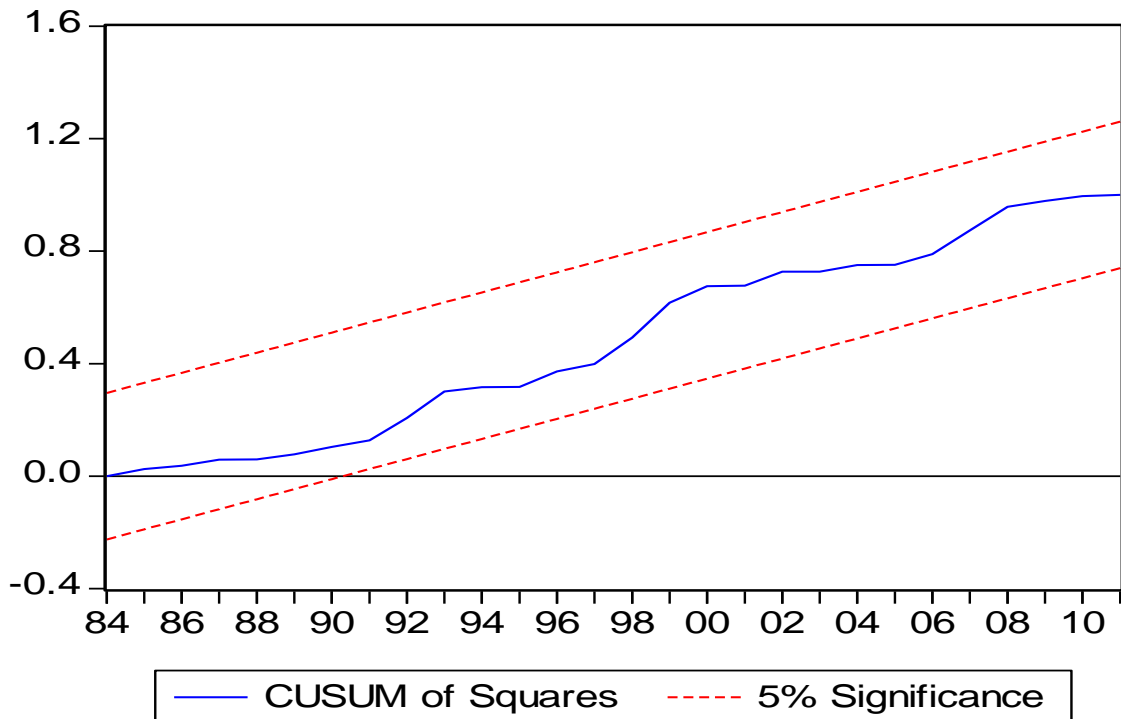

Table 4: 7 Bounds Test Critical values for model with K= 5

Case V: Both intercept & trend unrestricted					
0.01		**0.05**		**0.10**	
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
3.93	5.23	3.12	4.25	2.75	3.79
Case IV: Unrestricted intercept & restricted trend					
0.01		**0.05**		**0.100**	
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
3.50	4.63	2.81	3.76	2.49	3.38
Case III: Unrestricted intercept & No trend					
0.01		**0.05**		**0.10**	
Lower (I(0))	**Upper (I(1))**	**Lower (I(0))**	**Upper (I(1))**	**Lower (I(0))**	**Upper (I(1))**
3.41	4.68	2.62	3.79	2.26	3.35

Source: Taken from asymptotic critical bounds in Pesaran et.al.(2001) under tables CI(iii), CI(iv) & CI(v): pp. 300-301.

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