

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES

**FOREIGN AID, SAVING AND ECONOMIC GROWTH:
THE CASE OF ETHIOPIA
(COINTEGRATION AND CAUSALITY ANALYSIS)**

By Tirunesh Muluneh

June 2016
Addis Ababa

**FOREIGN AID, SAVING AND ECONOMIC GROWTH:
THE CASE OF ETHIOPIA
(COINTEGRATION AND CAUSALITY ANALYSIS)**

TiruneshMuluneh

**A project Submitted to the School of Graduate Studies of Addis Ababa
University in Partial Fulfillment of the Requirements for the Degree of Master
of Arts in Applied Economic Modeling and Forecasting**

Addis Ababa University

Addis Ababa, Ethiopia

June 2016

ADDIS ABABA UNIVERSITY
DEPARTMENT OF ECONOMICS

This Is To Certify That The Project Prepared By **TiruneshMuluneh**, Entitled: “Foreign aid Saving and Economic Growth: The Case Of Ethiopia” and submitted in partial fulfillment of the requirement for the Degree Of Master Of Arts In Applied Economic Modeling And Forecasting complies with the regulation of the university and meets the accepted standards with respect to the originality and quality.

Approved by:

_____ Signature _____

_____ Date _____

Acknowledgment

First and foremost my gratitude goes to the almighty GOD who allowed me to start and completed this paper and for his unrestricted helps and supports in every part of my life.

Next, I would like to express my sincere gratitude to my advisor Dr. Haile Kibret for his constructive advice and guidance while I was writing this thesis. I am grateful to his invaluable comments and suggestions from which I have benefited a lot.

My appreciation also extends to all my family specially my husband and my little angel daughter for their follow up, understanding and support. The last but not least appreciation goes to all my friends, and class mates who have been giving me valuable comments and support throughout our interactions.

Abstract

The study has examined the direction of causal relationship between foreign aid, savings and economic growth in Ethiopia, using annual time series data from 1974/75 to 2013/2014. Empirical analysis has been performed by using Johansen Maximum likelihood and pair wise granger causality method for cointegration and causality test respectively. The main result shows that foreign aid has a significant and positive effect on economic growth in the long run as well as in the short run. However, aid has insignificant and negative effect on savings in the long run while it has significantly negative influence in the short run.

Further, the findings revealed a unidirectional causality running from economic growth to savings and foreign aid. It shows that unidirectional causality run from economic growth to savings; and also, there is two ways (feedback), granger causality between foreign aid and saving, which implies policies designed to stimulate domestic saving also facilitates foreign aid.

To maintain and accelerate growth, should formulate policies to intensify the allocation of foreign resources into investment projects.

Table of Contents

Acknowledgment	i
Abstract	ii
Table of Contents	iii
List of tables.....	v
Acronym	v
Chapter One	1
Introduction.....	1
1.1 Background of the Study.....	1
1.2 Statement of the problem	3
1.3 Objectives.....	4

1.4 Hypothesis of the study	4
1.5 Significance of the study	5
1.6 Data Sources and methodology.....	5
 Chapter Two.....	 6
2. Review of the Literature	6
2.1 The Definition of Foreign Aid	6
2.2. Theoretical framework.	7
2.2.1 Growth Theories and the Foreign aid.....	7
2.2.2 Relationship between foreign aid and saving.....	10
2.2.3 Saving and economic growth; Causality issue	12
2.3. Empirical Literature	13
2.3.1 Relationship between Aid and Economic Growth	13
2.3.2 The relationship between saving and economics growth	14
2.3.3 Foreign aid and saving debate	16
2.4. Empirical studies of Aid, Saving and Growth in Ethiopia.....	16
 Chapter Three.....	 19
3. Model Specification and Methodology.....	19
3.1 Data and Data Sources	19
3.2 Model Specification	19
3.2.1 Growth Equation.....	19
3.2.2 Saving Equation.....	20
3.3 Estimation technique.....	21
3.3.1 Stationarity and Non – Stationarity	21
 Chapter Four	 23
4. ESTIMATION AND DISCUSSION OF RESULTS	23
4.1. Result of Unit Root Tests.....	23
4.2. Growth Equation; Long run Equilibrium and VECM.....	24
4.3 Long run saving Equation	27

4.4. Causality Analysis.....	29
Chapter Five.....	33
5. Conclusion and recommendation.....	33
Reference	35
Appendix.....	38

List of tables

Table 4.1 Augmented Dickey-Fuller (ADF) Test.....	23
Table 4.2 Johansen’s Cointegration Test for Growth Equation.....	24
Table 4.3 Long run Growth Equation.....	25
Table 4.4 Error Correction Model in Growth model	26
Table 4.5 Johansen’s Co integration test results for saving equation.	28
Table 4.6 Long run Saving Equation	28
Table 4.7 Pair wise Granger Causality between saving and GDP	29
Table 4.8 Pair wise Granger Causality between gdp & aid	30
Table 4.9 Granger Causality between Saving & aid.....	30

Acronym

- ADF-Augmented Dickey Fuller test
- AIC- Akaike information criteria
- CSA- Central statistics Authority
- DAC - Development assistance committee

ECM - Error Correction Model

GDF- Global Development Finance

GDI- Global Development Indicators

GDP-Gross Domestic Product

LDCs - Less developed countries

ICOR -Incremental Capital Output Ratio

Mofed- Ministry of finance and economic development

NBE- National Bank of Ethiopia

ODA- Official development assistance

OECD-Organization for Economic Cooperation and Development

OLS-Ordinary lest square

VAR - Vector Autoregressive

WB - World Bank

Chapter One

Introduction

1.1 Background of the Study

Ethiopia is one of the poorest countries in the world; its economy remains heavily dependent on agriculture, which accounts for 43% of the GDP (Tewodros, 2015). Accordingly, 83% of the population gains its livelihood directly or indirectly from agricultural production. Despite the fact that the history of growth performance was poor in the past decades, the country has experienced strong economic growth in recent years. Real GDP growth averaged 11.2% per annum during 2003/04 and 2008/09 period, placing Ethiopia among the top performing economies in sub-Saharan Africa (NBE, 2015).

On the other hand the most important permanent feature of the Ethiopian economy is the shortage of resource (financial) gap. The resource gap can be explained as the presence of savings investment gap, foreign exchange gap and fiscal gap. Thus the presence of resource gaps in one way or other shows that the domestic economy is not capable of generating enough finance to close these gaps and make the country's reliance on foreign capital inflow compulsory.

The Historical beginning of Foreign aid is related to Marshall Plan in the late 1940's which marks the beginnings of the United States aid program, its purpose was to reconstruct the war-torn economy of Western Europe (Todaro, 1994). Basically, European countries first received external assistance in the post-world war II period. During this period European's were faced by large balance of payment deficit and economic depression. Since the end of the Cold War, most aid has been targeted to promote economic growth and improve public well-being in the developing and underdeveloped countries (Vanarith 2009). However, through time developing countries increasingly received foreign aid from multilateral and bilateral sources.

In Ethiopia, an inflow of external resources such as loans and grants has started in the mid of 1950, the year in which the relationship between the United States and Ethiopia reached a higher level. For instance, during the third five-year plan period (1957-1973), 25 percent of the required total investment was covered by external public capital (Yohanse, 2011). The magnitude of loans

and grants that Ethiopia received in the years preceding the revolution was considerable. But due to the existing political economic system it hardly contributed to economic progress. It was characterized by trifling development objectives.

Similarly, during the post revolution period too, 37 percent of total investment expenditure of the annual campaign of 1979-1989 was financed by foreign aid. Comparatively the total aid flow to the country has increased under the current economic system. It is reported that during 1980-97, Ethiopia's total official development assistance receipt exceeded US \$ 17 billion in nominal terms (Sintayoh, 2006).

Generally since the recent policy changes the magnitude of loans and grants that the country received in subsequent years has increased continuously. For instance, the share of foreign aid on total investment has increased to 83.3 percent in 2000/01-2008/09.

While there are many reasons for giving foreign aid, the most notable argument is to bridge the gap between domestic saving and domestic investment and therefore, to accelerate growth (Hem C. 2009). Thus, foreign aid has a potential to play a key role in boosting developing countries' economic growth. There are two stands of literature on the role of foreign aid on economic growth. The first set of studies claim that foreign capital inflow is necessary and sufficient for economic growth in less developed countries. They state that there is a positive relationship between aid and economic growth because it not only augments domestic resources, but also supplements domestic savings, assists to close the foreign exchange gap, creates access to modern technology and managerial skills, and allows easier access to foreign market. The second set of studies asserts that external capital has significant negative effects on the economic growth of recipient countries. According to this view, foreign aid is fully consumed, substitutes rather than compliments domestic resources, assists import of inappropriate technology, distorts domestic income distribution, and encourages a bigger, inefficient and corrupt government in developing countries. (Manucheh T and Johan 2004; Hem C. 2009).

Number of studies have conducted on foreign aid, saving and growth; the relationship shows that the results are mixed. Moreover, these studies do not provide clear-cut conclusions. Different

time series and cross-country investigations have come up with different results and different policy implications.

1.2 Statement of the problem

One major problem facing Ethiopia in her attempt at accelerated economic growth and development is lack of capital formation. Inadequate capital formation to undertake real investment activities has adversely affected the output level of the economy. Basically, capital formation is determined by the saving rate but developing economies have faced low level of income and hence low level of saving rate. Therefore, this low level of saving rate and the required rise in investment creates a resource gap. One of the major economic problems of any developing and underdeveloped countries is inadequate savings i.e. inadequate domestic savings or inappropriate mobilization of savings for investment purposes is what is termed in the literature as savings constraint (saving gap)(Murtala, A. 2015).

The savings-investment gap in Ethiopia recently has been widening from an average of 1.1% of GDP during the Imperial period (1960-74) to 11.7% of the GDP in the EPRDF (1991/92-2007/08)Yohanse (2011). The presence of resource gap (gross domestic investment-gross domestic savings) forces the country to rely on an inflow of foreign finance (specifically foreign aid) to bridge the gap.

In less developed countries, foreign aid was perceived only as an exogenous net increment to the capital stock of the recipient country. Most of the earlier aid economic growth relationship was based on the Harrod-Domar growth model with the causal chain running from aid to savings to investment and hence growth. As Dollar and Easterly (1999) argued, this type of considerations do not necessarily hold. This is because the growth impact of aid is very much complex that requires assessing its effect in a wider macroeconomic setting. For instance, inflow of aid may free up domestic resources intended for investment to be allocated into less productive ventures. Moreover, inflow of foreign aid beyond the absorptive capacity of the economy has the potential to induce undesirable influence through increasing inflation rate.

Ethiopia has been experiencing low domestic savings even compared to low income sub-shara African countries which has made it unable to meet investment requirements. For instance,

Shimels (2015) explained that, average gross domestic saving to GDP ratio in real terms is 9.7% in the 1990s and 6.4% for the period 2000-2008 which is lower than the corresponding average gross domestic saving to GDP ratio for sub-Saharan Africa.

In the last sixty years sub-Saharan African countries in general and Ethiopia in particular, have been receiving large amount of foreign aid, but these countries rank among the most poorest countries of the world; i.e. despite the significant increase in foreign inflows the economic growth has not been satisfactory. Most of these countries have been suffering from low level of development. Thus, the actual role of foreign capital inflow has been an area of controversy. Though foreign aid has its own importance in some aspects, it is in question whether aid assists generally developing countries' and particularly that of Ethiopia in accelerating economic growth by positively affecting saving and investment in the country is in question.

Some of the questions need explanation on the link between foreign aid, saving and economic growths, in Ethiopia are:-

- Does foreign aid positively affect economic growth and savings in Ethiopia?
- Is there a causal relationship between foreign aid, saving and economic growths in Ethiopia?

Such and similar questions are not as easy as to test them and provide answers for. Generally, this paper tries to explain whether foreign aid has a positive and significant impact on saving and economic growth in Ethiopia i.e., whether it has significantly helped the country in financing the saving-investment gap, raising the aggregate saving and accelerating economic growth.

1.3 Objectives

- Examine the direction of causal relationship between foreign aid, saving and economic growth in Ethiopia.

1.4 Hypothesis of the study

Based on empirical literature on the relationship between aid, saving and economic growth in developing countries, the study proposes the following relationships to hold true in our analysis.

A) There exists a long run relationship between foreign aid, saving and economic growth for Ethiopia

B) There is a positive and significant effect of foreign aid on saving and Growth in the long run.

1.5 Significance of the study

The literature on the relationship between foreign aid, saving and economic growth are mainly in the cross sectional analysis of developing countries. Particularly, in the Ethiopian case, the number of studies conducted so far is limited in number and scope, in which further study is required. This paper plans to evaluate how well the Ethiopian economy is using its own savings and to examine whether the resource inflow in the form of foreign aid have had significance impact on economic growth for Ethiopia. Therefore this study will help in filling the knowledge gap in such area.

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

1.6 Data Sources and methodology

The study is based on a country level macro-data covering the period from 1975 to 2014. The necessary data for the paper is collected from Ministry of finance and Economic Development (MOFED), National Bank of Ethiopia (NBE), Central statistical agency, World Bank's Global Development Finance (GDF) and World Bank online Data bases.

In this study two models were specified and estimated by using Vector Autoregressive (VAR) model, and the paper also uses the co-integration test as to assess whether or not there is a long term relationship between foreign aid, saving and economic growth using Johansen co-integration method. The paper also employed pair wise granger causality test to investigate the causality relationship between foreign aid, saving and economic growth.

Chapter Two

2. Review of the Literature

2.1 The Definition of Foreign Aid

Foreign aid refers to the transfer of real resources from governments or public institutions of developed countries to governments of less developed countries (LDCs) in the third world. The flows of foreign resources can be of many types and it is important to know the different elements. Foreign capital flows are generally divided into two broad streams – official and private. The official capital flows are in turn subdivided into bilateral and multilateral flows. Official bilateral flows consist of capital provided by government of donor to government of recipient countries. Multilateral flows consist of capital flows from multilateral organizations such as the World Bank, the United Nations, the IMF. Both types of official flow can take the form of grants, loans or grant like contributions. Grants should be considered as the most desirable type of foreign aid since they represent a net addition to the resources available for development purposes. Some loans are given by the international lending agencies (i.e. World Bank) at interest rate which are lower than those in the capital markets (or on concessional terms). Where the loans are granted to the LDC's at a concessional rate for very long periods, say for 40-50 years, the inflow of foreign resources in the form of private/ commercial loans do not take the form of foreign aid as foreign private investment in the LDC's are not exactly foreign aid because of they are given on commercial terms.

Development Assistance Committee (DAC) defines foreign aid as official development assistance (ODA) and technical aid. The term excludes military assistance. The flows of official financial assistance need to meet three important criteria to be considered as ODA MoFED, (2005).

First, the purpose has to be support economic development in recipient countries; The second criterion is that the resource transfer is at concessional financial terms and conditions of the financial package must be softer than those available on a commercial basis. DAC defines as Official Development Assistance (ODA) official flows that have a grant element of greater than 25% at a 10% discount rate or less.

The final criterion is that the flows should come from governmental agencies and go to developing country governments. Official Development Finance comprises ODA plus international flows satisfying only the first and third criteria. Flows from voluntary agencies may also be counted as aid, but do not satisfy the third criterion.

Any official flow that does 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).

2.2. Theoretical framework.

2.2.1 Growth Theories and the Foreign aid

There are various factors which determine economic growth of a country. They include the quality of labour force, resources (natural and financial), capital, technology and the institutional setting of economic activities. Early economic growth theories in the 1950s and 1960s stressed that the basic problem for many developing countries was precisely lack of capital formation in achieving economic growth (Conchesta, 2008). Thus these theories were with the view that development assistance was important for these countries to fill the finance gap and technology gap. More popularly, these gaps were known as saving gap and the trade gap. However, there are different views on the role of foreign aid in filling the savings gap and the trade gap and thus their contribution to growth in developing countries. In the early literature, foreign aid is considered as a driving force for economic growth through physical capital accumulation in recipient countries.

In the following sub-sections we are trying to explain some growth theories.

2.2.1.1 Harrod–Domar model of economic growth

The Harrod-Domar model, points out that output depends on the investment rate and the productivity of that investment. In an open economy, investment is financed by savings which is a sum of domestic and foreign savings. This model implies that investment is the only factor determining growth, is one popular conceptual framework being used to justify the aid growth relationship. With investment assumed to be equal to savings, the model explains that poor

countries suffer low economic growth due to the saving gap, which happens when domestic savings are insufficient to finance the level of investment required to achieve the desired growth rate. Foreign aid is thus expected to play a supportive role in spurring growth by supplementing to domestic savings and filling up the gap. Primarily based on the Harrod-Domar model, the two-gap model of Chenery and Strout (1966) made a significant contribution to foreign aid literature by focusing on not only the saving gap but also the foreign exchange gap. The two-gap model points out that international trade and foreign exchange besides domestic savings are also important to the development of an economy and that a gap between import requirements for a given level of production and foreign exchange earnings can reduce economic growth by constraining both imports and savings. Developing countries barely overcome the shortage of foreign exchange by their own resources and hence foreign aid supposedly helps to relax this constraint. The Harrod– Domarmodel has however received some criticism as it does not allow the substitution of labor for capital and assume a stable linear relationship between investment and growth.

2.2.1.2 The Neo-classical (solow) growth model

The Solow neoclassical model solves the Harrod– Domard rawbacks in which capital and labor are substitutable and exhibit diminishing return to scale. The basic neo-classical growth model shows that for the growth of an economy capital accumulation is the central issue. The model further shows that aggregate saving determines the growth of capital stock, which, in turn plays a key role in the growth of an economy.

Solow (1956) model takes rate of saving, population growth and technological progress as exogenous. This implies that policy measures do not affect long run growth rate. Thus, the standard neoclassical growth model does not emphasize the contribution of policy for long run rate of growth (Durberry, Gemmell and Greenway, 1998).The model continuously affirms the crucial role of capital accumulation, part of which constitutes foreign aid, in promoting growth. However, in the model, there is no permanent causal relationship between investment and growth (Easterly, 2003) and therefore, it restricts the use of the basic neoclassical model to study the impact of aid on growth over the long-run.

2.2.1. 3 Endogenous growth models

Critics dissatisfied with the exogeneity of the technology worked to "endogenize" technology and developed the endogenous growth theory that includes theoretical explanations of technological advancement [Romer (1986), Lucas (1988)]. Romer (1986) argued that long run positive growth rate and technological progress is achieved by accumulation of knowledge (which he considered as capital input to production and has increasing returns), an endogenous factor, by forward looking and profit maximizing agents. Moreover, in another paper Romer (1990) argued that stock of human capital determines the growth rate and integration into world markets will also increase the growth. "The theory also incorporated a new concept of human capital, the skills and knowledge that make workers productive. Unlike physical capital, human capital has increasing returns. Therefore, overall there are constant returns to capital, and economies never reach a steady state. Growth does not slow as capital accumulates, but the rate of growth depends on the types of capital a country invests in" [Elhanan Helpman (2004)]. Morrissey (2001) describes that human capital plays an important role, but emphasis is also placed on technological change, especially spillovers, research and development, learning by doing and externalities associated with an increase in knowledge. The important consequence is that the theory generates the potential for increasing long-run per capita income growth rates. Moreover, aid has long run effects over economic growth if it is in form of technologically advanced capital goods which are far better than domestic technology.

In particular, the assumption of increasing returns to capital of endogenous growth model implies that foreign aid may improve growth in long-run and therefore supports the estimation of the long-term economic impact of aid (Kargbo, 2012). Furthermore, the model assumes the non-linear relationship between investment and growth (as opposed to the neoclassical growth model); and so there would be the case of measuring —the quality of investment and the quality of foreign aid (Easterly, 2003). Based on this model, the contribution of external assistance to growth can be estimated through other factors in addition to capital accumulation. The endogenous model, for instance, also stresses the critical role of human capital in the growth process; and therefore this justifies the assessment of foreign aid on building up human capital in recipient countries. Indeed, aid in the forms of both technical assistance and investment in

education and health care system potentially fosters human capacity building and then production outcomes (Kargbo, 2012).

2.2.2 Relationship between foreign aid and saving

In the economic literature of the last four decades studies have been undertaken in LDCs to determine whether foreign aid and domestic savings are complementary or substitute. An examination of the most well known theoretical point of view shows that, still no single theory or perspective has emerged with anything nearing a consensus regarding the impact of foreign aid on the savings of the recipient country. However, a clear explanation of the relationship between foreign aid and domestic savings can be found in Harrod-Domar model and dual-gap model.

In the Harrod-Domar growth model, growth is held to be determined by the saving rate, where the growth rate of per capita income. i.e.

$$(1).g=S/ICOR.....2.1$$

Where, S is the marginal saving rate, ICOR is the incremental capital output ratio and g is the economic growth rate. In this model, investment equals savings. Anything, that increases S or decreases ICOR, will increase g. Aid has been introduced into this model as either augmenting savings or improving technology.

Chenery and Strout (1966) argued that foreign aid is a supplement to domestic savings and hence raised the growth rate of output to $(S+A)/ICOR$ where A is foreign aid as a percentage of recipient GNP.

$$(2).g=SA/ICOR=(S+A)/ICOR.....2.2$$

This increase in the growth rate would raise income, and then the savings rate would increase because the marginal saving propensity is greater than average saving propensity in developing countries and hence the higher growth rate would become self sustaining without the need for further inflows of foreign aid.

In the contrary, Griffin (1970) presented an early criticism of this approach. Griffin (1970), for instance, argues that foreign aid does not contribute to economic growth and that it fails to foster democratic political regimes. Instead, foreign economic assistance could retard economic development by lowering the domestic saving rate. Rajan and Subramanian (2008) also documents a similar conclusion to that of Griffin (1970). However, Papanek (1973), in a cross-country regression analysis of 34 countries in the 1950s and 51 Griffin assumes that foreign aid should be treated as augmenting income. An increase in income of 'A' (foreign aid) would increase consumption by '(1 - S)A' and increase the funds available for investment by 'SA'. Consequently, 'SA' would increase from 'SA= S', in equation (1) to

$$(3)SA=S + sA.....2.3$$

However, 'A' of this increase is the amount of foreign aid. Consequently, domestic savings would be crowded out by the foreign aid and this decline in savings would equal '(S - 1)A'. Hence, Griffin argues that foreign aid would partially crowd out domestic savings and investment because part of this aid would go to consumption. Furthermore, from the permanent income hypothesis, if this foreign aid was viewed by consumers as being a temporary increase in income, the decline in domestic savings would almost exactly match foreign aid. Grinois and Bhagwati (1976) argue that even if substantial crowding out does occur, foreign aid would still increase growth in the short run. A higher growth rate would itself increase domestic savings, which in the long run could cause domestic savings to rise above the level it would reach without foreign aid. A more general version of equation (3) is that aid may reduce domestic savings, leave it unchanged or increase domestic savings. Equation (3) can be rewritten as

$$(4)SA=S + \alpha A.....2.4$$

If $\alpha= 1$, then all aid goes to investment leaving domestic savings unchanged. This was the situation in equation (2). Next there is the possibility that $0 >\alpha < 1$. Here said is beneficial to growth but part of this positive impact is crowded out by reduced domestic savings. This was the case in equation (3). There are two more extreme possibilities. One is that foreign aid will

reduce investment and, hence, growth. This would be the case if $\alpha < 0$. The other is that foreign aid will increase domestic savings. This would be the case if $\alpha > 1$.

2.2.3 Saving and economic growth; Causality issue

Life-cycle hypothesis (LCH) proposed by Modigliani (1986) advocated that saving is a positive function of income growth. Higher rate of income growth means the aggregate income of active workers will rise which in turn rises the lifetime resources of individual's on which consumption and saving depends. As a result, income growth will result an increase of aggregate saving. However, Tobin (1967 cited in Ozcan et al., 2003) argued that the above conclusion works if future income is unanticipatable. If future income is anticipatable, forward looking individuals will expect higher income in the future which motivates them to consume more today. This reduces the saving rate of working individuals and may offset the greater effect of higher income growth.

However, the issue of causality between savings, investment and growth has plagued growth economics since the start. The controversy can be cast in terms of two leading theoretical perspectives: the "Marx-Schumpeter-Keynes view" versus the "Mill-Marshall-Solow view" (Wondessen (2001).

The first view posits that investment (Keynes, and to some extent, Marx) and innovation (Schumpeter, Marx) are the two variables that drive output growth. In this context, savings adjusts passively to meet the level of investment required to hold macroeconomic equilibrium and deliver a certain growth rate of output. In this view growth leads savings. In contrast, in the Mill-Marshall-Solow approach that channel of causality is reversed as it assumed that all savings is automatically invested and translated into output growth under wage-price flexibility and full employment. As a result, in the Mill-Marshall-Solow approach savings leads economic growth. The two schools deliver alternative lines of causality between savings, investment, innovation and growth. These causality issues are still relevant in an open economy with capital mobility.

On the other hand, while theories differ in their implications for causality, empirical studies also differ in their results. The view that growth appears to cause saving rather than the reverse has

found support in several recent papers. Christopher et al. (1994) examined the relationship between saving and economic growth in a sample covering sixty four countries over several decades, and found that past growth predicts future saving rates, while past saving rates do not predict future growth. The study of Gavin et al. (1997), where authors look at saving behavior in Latin America, also emphasizes that higher growth precedes higher saving rather than the reverse. It is only after a sustained period of high growth that saving rates increase and may do so with a delay that can be quite significant. Some papers support the reverse view. Alguacil et al. (2004) investigate the saving-growth nexus in Mexico by taking into account both the role played by foreign inflows in complementing domestic saving and the beneficial effects of foreign direct investment on domestic investment and income. Salih T. and Ainur N. (2006) support Solow's growth model (1956) presumption that high savings lead high growth and not vice versa.

2.3. Empirical Literature

The aid, saving and growth literature is dominated by cross-country studies of growth regression and the results have been mixed.

2.3.1 Relationship between Aid and Economic Growth

The relationship between aid and economic growth has always been a controversial issue. Some scholar as discussed below find that aid has positive effects on economic growth, while others find that it has no effect.

One of the earliest studies of the effect of aid on economic growth was conducted by Voivodas (1973). Voivodas found that for a sample of 22 least developed countries from 1956-1968 aid had a negative impact on economic growth. His result, however, may have not been accurate due to the poor quality of his data and the limited econometric technique available at the time. However, Boone (1994) also found that aid had not raised any growth rates in the developing countries. Boone conducted a study of the impact of aid on 97 countries over a period of 29 years, and found that aid does not have any positive impact on any of the factors that promotes economic growth—e.g., human resource and domestic investments.

Vasquez (1998) reached a similar conclusion. Using a sample of 73 countries from 1971 to 1995; he studied the effect of bilateral aid and multilateral aid and found that neither aid per capita nor aid as a ratio of GDP is positively related to economic growth. Rather, he found that aid as a percentage of GDP is negatively related to economic growth. He also found that increasing aid is not related with any factor that would enhance economic growth.

In contrast, some studies found that aid have positive effect on economic growth. Dowling and Hiemenz (1982) studied the effect of aid on economic growth in Asian continent. They used a sample of 13 countries receiving a substantial amount of aid. After controlling for the effect of trade, finance and government intervention, they found that aid has positive and significant effect on economic growth. Similarly, Levy (1988) studied the effect of aid in a sample of Sub-Saharan African countries from 1968 to 1982, and found a significant and positive relationship between the ratio of aid to GDP and economic growth.

Shahzeb (2011), studied foreign aid and economic growth in the case of Pakistan from 1972 to 2008. He employed cointegration and OLS estimation methods. The cointegration results indicated that there exists a long run relationship between ODA and PGDP which is a positive relationship.

E. M. Ekanayake and Dasha C (2010) analyzed the effects of foreign aid on the economic growth of developing countries. The study used annual data on a group of 85 developing countries covering Asia, Africa, and Latin America and the Caribbean for the period 1980-2007 by using panel data. They found mixed result and indicate that foreign aid had mixed effects on economic growth in developing countries.

2.3.2 The relationship between saving and economics growth

Pinchawee and Rasmidatta (2011), studied the relationship between domestic savings and economic growth using time series annual data for Thailand, the study covered the period of 1960 to 2010, the empirical result demonstrated the unidirectional causality running from economic growth to savings. R.Verna (2007), studied saving, investment and growth in India between 1950/51 to 2004/2005, using ARDL-bound test approach, the study found that

savings does not significantly affect economic growth, the study further suggested a unidirectional causality running from growth to saving.

Barnabas N. & Patrick T.(2014) examined the effect of foreign direct investment, foreign aid and grants and foreign commercial borrowing on domestic savings. The study used the co-integration technique for the estimation of the long-run and the Error Correction Model (ECM) to estimate the short-run dynamic savings model in Ghana. The outcome of the study shows that there is a positive and significant effect of foreign capital on real domestic savings in Ghana in the long run, though not steady but volatile. They conclude that foreign capitals do not displace domestic savings both in the short-run and the long-run. Lean and Song (2009) examined the domestic savings and economic growth relationship for China from 1955-2004, employing cointegration and causality tests. China has enjoyed high levels of economic growth and savings for a number of decades and they found that indeed, there existed a long run relationship between economic growth and savings in China, taking into account the two savings rates they employed; household savings and enterprise savings. They found the existence of bidirectional causality between domestic savings and economic growth in the short run and a unidirectional causality from domestic savings growth to economic growth in the long run. Contrary results were also observed by Seng S. (2014) who modeled the relationship between domestic saving and economic growth in Cambodia, using data for the period 1989–2012. The empirical analysis was based on Granger Causality Test. The study found that domestic saving does not Granger cause economic growth. Economic growth itself is also not found to Granger casual saving. So it can be concluded that domestic saving and economic growth are independent of each other in this done on Cambodia.

Mohan (2006) examined the relationship between savings and economic growth for high, middle and low income countries utilizing annual data from 1960-2001. Contrary to the traditional view, the results indicated that causality ran from economic growth to saving. The findings also indicate that in countries with a forced savings policy like Singapore, causality runs from savings to economic growth.

Kafayat A. and Moyo B. (2013), investigated the relationship between savings and economic growth in Botswana between 1980 and 2008. The study employed the bounds testing approach to cointegration in the examination of the savings-growth relationship in the economy. In both the short and long run, domestic savings is positively and significantly related to growth.

2.3.3 Foreign aid and saving debate

Griffin (1970), estimated the relationship between foreign aid and domestic savings with an empirical study using data from 32 LDCs for 1962-1964 and found a negative relationship between foreign aid and domestic savings. However, he used the current account deficit as a measure of foreign capital and estimated gross domestic savings as the difference between gross domestic investment and the capital account balance.

Bowles(1987) tried to address the issue of causal relationship between foreign aid and domestic savings, applying the bivariate Granger causality tests to the annual data related to 20 countries over the period 1960-81. He came up with mixed results. In half of the 20 countries, time series data did not indicate any causal relationship between foreign aid and domestic savings. In three cases, domestic savings caused aid, in five cases, aid caused domestic savings and in two cases, there was a feedback between foreign aid and domestic savings in the Granger sense.

Okpanachl and Chidubem C. (2011), studied the impact of foreign aid on savings in Nigeria, by using a two-step approach of Engle-Granger procedure in a co-integration analysis. He used time series on a number of macroeconomic variables, spanning for the period 1970-2009. He concluded that in the long-run, foreign aid (ODA), impacts positively on national savings (GNS) and negatively in the short run.

2.4. Empirical studies of Aid, Saving and Growth in Ethiopia

Even if there are a few literatures conducted on the causality between foreign aid, saving and economic growth in Ethiopia, the existing literature shows the aid-growth relationship through its contribution on investment and import financing.

Tasew (2010), examined foreign aid and growth in Ethiopia using the multi-variate cointegration analysis, over the period of 1970 to 2009. The empirical result from the investment

equation shows that aid has a significant positive impact on investment in the long run. On the other hand, volatility of aid by creating uncertainty in the flow of aid has a negative influence on domestic capital formation activity. Foreign aid is effective in enhancing growth. However, the aid-policy interaction term has produced a significant negative effect on growth implying that bad policies can constrain aid effectiveness. The growth equation further revealed that rainfall variability has a significant negative impact on economic growth as the economy. His study indicated also that the country has no problem of capacity constraint as to the flow of foreign aid

Abeba (2002) examined the macroeconomic impact of external assistance on the economic performance of the Ethiopia for the period 1960/61-1999/00 using Johansen Maximum Likelihood estimation. The study has provided empirical evidences on the impacts of external assistance at its disaggregate level on the domestic saving, government income, government spending, real exchange rate and economic growth in general. The results of the study shows that the overall effect of aid (captured through the effect of loan and grant) on economic growth is negative.

Wondowesen(2011) analyzed the effect of Foreign Capital Inflow (FCI) on the economic growth, saving and investment in Ethiopia for the period 1974/75 to 2008/09. Empirical analysis has been performed by using Johansen Maximum likelihood method. He found that foreign aid has a significant and positive effect on economic growth in the long run as well as in the short run. It has also positive and statistically significant effect on investment in the long run. However, aid has insignificant and negative effect on saving in the long run while it has significantly negative influence in the short run. The net FDI has negative impact on economic growth in both long and short run where as Foreign direct investment has positive and statistically significant effect on saving both in the long and short run. The result further reveals that net FDI has insignificant but positive effect on investment.

Yohanse (2011)examined the impact of foreign aid on economic growth in Ethiopia throw the transmission mechanisms (i.e. investment, import and government consumption expenditure) using Johansson maximum likelihood approach over the period of 1970/1 to 2008/9. He found that in the long run foreign aid has a positive and significant impact on growth through its

significant contribution to investment and import. However, the dynamic short run model points out that aid to have a significant impact on growth it has to be assisted by good monetary, fiscal and trade policy. His result further implied that in the short run aid has significant impact on government consumption expenditure, which confirms the existence of aid fungibility. In addition he found the theoretical support for the views expressed by gap models study i.e. aid can enhance growth by financing the three gaps.

Jifar T. (2002) has tried to address the effect of foreign aid on public spending with particular reference to the case of aid fungibility in Ethiopia. The analysis was done using OLS estimation. In estimating the short run impact, he employed Error Correction Model. The estimated result in education and agriculture sectors were marked by non-fungibility in which case the sectoral aid impact on sector spending have crowding in effect. However, for transport and communication and construction sectors, aid fungibility seem to exist which means that there is crowding out effect. In this case, the sector aid impact on the sectors spending is negative. For non-developmental expenditure, aid is found to be significantly affecting debt servicing expenditure but insignificant for general service and defense expenditures.

Haile (2015) investigates the impact of foreign aid on economic growth in Ethiopia using time series data for the period 1974 to 2011 using the Autoregressive Distributed Lag (ARDL) approach. The estimated results provide that the foreign aid has negative impact on economic growth, but aid has positively contributed to economic growth in Ethiopia if supplemented with stable macroeconomic policy environment.

Shimels(2014) examines the causal relationship among saving, investment and economic growth in Ethiopia using time series data for the period 1969/70-2010/11 using the Autoregressive Distributed Lag (ARDL) approach. He found that granger causality analysis show that there exists bidirectional causality between gross domestic investment and economic growth as well as between gross domestic savings and gross domestic investment. Granger causality running from investment to saving and from investment to growth is strong as witnessed from impulse responses and variance decompositions. Although there is unidirectional granger causality running from economic growth to gross domestic saving, it is weak.

Chapter Three

3. Model Specification and Methodology

3.1 Data and Data Sources

As the success of any econometric analysis ultimately depends on the availability and accuracy of data, it is, therefore essential to discuss the source and nature of data. The study will use 40 years of secondary time series data spanning from 1974/75 to 2013/2014 years. The data was collected from different sources. The major data sources are National Bank of Ethiopia (NBE), Ministry of Finance and Economic Development (MOFED), World Bank data base and Central statistics Authority (CSA) of Ethiopia. Besides, IMF CD-ROM, WB CD-ROM, and UNCTAD-CD-Rom were used.

3.2 Model Specification

Most of the studies have focused only on the role of saving on growth, while some others only focused to study the impact of aid on economy growth. This study, attempted to assess the possible association between foreign aid, saving and economic growth by specifying the growth and saving equations Shahzeb's S. (2014) study.

3.2.1 Growth Equation

Shahzeb S. (2011) stated that for sustained economic growth a country needs persistent increase in investment and savings, human skills, output and employment, adoption of more productive technology and development of new institutions. But the question is that how these things will be accelerated? Lucas (1988), developed a growth model with fixed technology parameter (A) and human capital as the main growth driver through scaling up of labor productivity. Lucas emphasized a positive external effect of education that forms 'knowledge externality'. The engine of persistent economic growth is to increase investment in physical and human capital which produces increased output and increase per capita income. The required investment depends on savings, but if savings are short than the required investment, then foreign aid comes into play.

Jones (1996) and Morrissey (2001), on the other hand suggested the human capital formation in endogenous growth model with technology/ideas. It represents the stock of skills, education, competencies and other productivity-enhancing characteristics embedded in labour.

However, the endogenous growth models developed by Lucas-Romer extend the old neo-classical model by emphasizing the role of endogenous factors of human capital stock and Research & Development activities as the main engines of economic growth. Therefore, the production function under endogenous growth theory can be written as:

$$Y_t = Af(K_t, H_t, L_t) \dots\dots\dots (3.1)$$

Where, Y_t =output, K_t = physical capital, H_t = human capital, L_t = labour force and A = parameter

However, recently different scholars come to include various variables that are believed to affect the growth of a country; these include a variable that augments capital flows and hence saving such as export.

Hence, growth function is given by:

$$GDP = f (AID, S, X, LF, HC) \dots\dots\dots (3.2)$$

Where, GDP = Real gross domestic product, AID=foreign aid (official Development assistance), HC=human capital proxied by education expenditure, S=gross domestic saving, X= export and LF=labour force(growth rate)

$$\text{LogGDP} = \alpha_0 + \alpha_1 \text{LogAID} + \alpha_2 \text{LogS} + \alpha_3 \text{LogX} + \alpha_4 \text{LF} + \alpha_5 \text{LogHC} + U_t$$

3.2.2 Saving Equation

To examine the relationship between foreign aid and saving, the following saving function is specified.

$$GNS=f(AID,X, IR, PCI)\dots\dots\dots 3.3$$

Where, GNS=gross national saving, AID=foreign aid (official development assistance), X= export, RI = Real interest rate and PCI = Per capital income.

$$\text{LogGNS}_t = B_0 + B_1\text{LogAID}_t + B_2\text{LogX}_t + B_3\text{IR}_t + B_4\text{LogPCI}_t + \varepsilon_t$$

Inclusion of each of the variables in the saving function have the following is justified as follows. As discussed in the literature, foreign aid could affect national saving positively or negatively depending on the substitutability and complementarily between saving and foreign aid. Export performance is also expected to influence the saving rate for several reasons Rana and Dowling (1988). First, exports (especially of primary products) often produce highly concentrated income and standard savings theory shows that the propensity to save from such income is high. Second, countries whose export performance is good tend to face fewer foreign exchange constraints on investment and therefore tend to provide more of an incentive to save. Third, to the extent that trade taxes are a major source of revenue, exports tend to increase government savings.

A number of studies hypothesized that the level of per capita income has a positive effect on the saving rate. The gross domestic product variable is justified on the ground that rapid growth leads to changes in relative income and life-time consumption patterns and increase in transitory income in relation to permanent income; the former influences the saving rate more than the later. The real interest rate is an important macro-policy variable that is widely cited in the literature. But the sign cannot be predicted a priori because the income and substitution effects work in opposite directions.

3.3 Estimation technique

3.3.1 Stationarity and Non - Stationarity

Before running the standard regression analysis and inference is drawn, it is a common a practice to check whether individual data series is stationary or not. For time series analysis, the variables are expected to be stationary with a mean of zero and constant variance. Hence, data should be tested if indeed that is the case.

This is because most time series data have a characteristic of stochastic trend. If a variable has stochastic trend, it needs to be differenced in order to obtain stationarity. Such process is called difference stationary process (Gujarati 2004). The number of unit roots a given variable possess determines how many times that variable should be differenced in order to attain stationarity.

There are several tests which are used to test whether time series variables are stationary or non-stationary; the Dick-Fuller (DF), the Augmented Dick-Fuller (ADF) test, Auto-Correlation Function (ACF) and Phillips-Peron test. In this study, the ADF test is used to determine the existence of a unit root.

The null hypothesis of ADF is $\delta = 0$ against an alternative hypothesis that $\delta < 0$. Where $\delta = \Theta - 1$. A rejection of this hypothesis means that the time series is stationary or it does not contains a unit root while not rejecting means that the time series is non-stationary.

Chapter Four

4. ESTIMATION AND DISCUSSION OF RESULTS

In this section, the results obtained from the various tests and model are presented and analyzed. The analysis covers the results obtained from the stationarity tests, the co-integration test, the causality test from the VAR model or the Vector Error Correction Model and its confirmation by the Granger Causality test as well as diagnostic tests.

4.1. Result of Unit Root Tests

Before any meaningful regression is performed with the time series variables, it is essential to test the existence of unit roots in the variables and to establish their order of integration. The variables used in the analysis need to be stationary and or should be cointegrated in order to infer meaningful relationship from the regression. The stationarity of the series is investigated by employing the Augmented Dickey-Fuller (ADF) unit root test.

Table 4.1 Augmented Dickey-Fuller(ADF) Test

	Variable	Intercept	trend & Intercept	None	Order of integration
1	LGDP	3.611997	0.123339	5.368499	I(1)
	DLGDP	-4.439911*	-6.545504*	-2.985222*	
2	LAIID	0.059017	-4.675612	3.360571	I(1)
	DLAIID	-9.381257*	-9.293307*	-7.701996*	
3	LHC	3.791758	-0.695194	9.648114	I(1)
	DHC	-4.032487*	-4.926345*	-1.091912	
4	LF	-2.551778	-2.723552	0.043139	I(1)
	DLF	-7.240328*	-7.180861*	-7.324362*	
5	LS	1.463924	-1.986389	2.676112	I(1)
	DLS	-7.980335*	-8.599708*	-7.143180*	
6	LX	-0.571402	-3.052998	1.156529	I(1)
	DLX	-8.973653*	-8.921160*	-8.801246*	
7	LGNS	1.813244	-1.667388	3.556921	I(1)
	DLGNS	-7.865796*	-8.630657*	-2.965338*	
8	LPCI	2.511463	0.492316	2.238468	I(1)
	DLPCI	-4.345690*	-5.940073*	-3.980228	
9	RI	-5.265450*	-5.281056*	-5.005228*	I(1)
	DRI	-8.424383*	-8.315412*	-8.546400*	

Source: own computation using eviews

*Note * denotes significant at 1% and 5%*

The ADF test statistics as depicted in Table 4.1 illustrates that all variables are non-stationary at levels with the three different specifications. That is, the test conducted fails to reject the null hypothesis of unit root in the three different specifications. Therefore, to avoid spurious regression all these variables have to be differenced to transform them to stationarity. In the second stage, the order of integration of the non-stationary variables were performed proceeding in the same way by means of ADF tests applied to all series in first differenced form.

The first differences of the variables are investigated for a unit root test and the test result proved that all of them are stationary in the three different specifications. Therefore, it can be concluded that all variables are integrated of order one. Therefore the first difference of all variables is used for estimation.

4.2. Growth Equation; Long run Equilibrium and VECM

A. Long Run Equilibrium

Once all the variables entered the growth equation are integrated of similar order (I (1)), the next step is testing for cointegration. The rank of the cointegrating vector is determined using the Johansen's maximum likelihood method. The test result (both λ_{trace} and λ_{max} statistics) rejects the null hypothesis of no co-integration both at the 5% and 1% significance level. In other words, the null of at most one cointegrating vector is not rejected.

Table 4.2 Johansen's Cointegration Test for Growth Equation

Hypothesis		Eigen value	trace static			Hypothesis		Maximum eigen test		
H0	Ha		λ_{trace}	5% critical	prob*	H0	Ha	λ_{max}	5% crit.	prob*
H0:r=0	HA:r>0	0.673	107.65	95.75	0.0059	H0:r=0	HA:r=1	42.49	40.07	0.026
H0:r=1	HA:r>1	0.502	65.155	69.81	0.111	H0:r=1	HA:r=2	26.55	33.87	0.28

Source: own computation using eviews7

Where (*) means rejection of the null hypothesis at the 5% and r denotes the rank of the long-run matrix. It identifies the number of cointegrating vectors.

The trace statics and maximal Eigen value test indicates the existence of one co integrating relationships. This result is an indication of the significant long- run relationship between the gross domestic product with gross domestic saving, aid, export, human capital and labour force. After identifying the long run relationship between the variable, estimated the long run equation in table 4.3

Table 4.3 Long run Growth Equation

Variable	Coefficient	t-statics
DLAID	1.567138	4.18676*
DLf	7.534721	0.26027
DLX	0.839468	5.00294*
DLS	0.201019	0.68322
DLHC	-2.313750	-5.13258*
C	-16.14034	-11.1863*

Source: own computation using eviews

Diagnostic Tests

Serial Correlation LM, Chi-square= 34.42

p-value = 0.5438

Normality (Jarque-Bera) =0.6325

Heteroscedasticity, Chi = 299.1305

P-value =0.4060

The diagnostic test performed suggests the adequacy of the model and the long run equation is reasonably acceptable. That is, the null of no serial correlation is not rejected at any conventional significance level. In addition, the test for normality show that the errors are normally distributed

and the null is not rejected at any conventional significance level and (see appendix 1 ARroot graph).

The long run growth result shows that all the variables except saving and labour force are statically significant. The estimated coefficients show that foreign aid has a positive impact on economic growth i.e. the elasticity of growth with respect to aid is 1.56.

Export has significant positive impact; on the contrary, human capital has a significant negative influence on growth. This result is in line with the findings of Shimels (2015). The reason why human capital is negative in explaining the economy growth is due to the return from schooling is low; it may be most likely people work without their profession.

B. Short Run (Vector Error Correction Models)

After identifying the existence of long-run relationship among the relevant variables, the vector error correction model is estimated. The VEC has cointegration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge to their cointegrating relationships while allowing for short-run adjustment dynamics (Harris, 1995). The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments. The error correction terms lagged one period is shown in table (4.4)

Table 4.4 Error Correction Model in Growth model

Variable	Coefficient	t-statics
ECM	-0.286491	-5.08040*
DLHC	0.099021	1.8126
DLF	7.586073	2.32171*
DLAID	0.143739	3.50533*
DLS	-0.053554	-0.053554
DLX	0.036253	2.59661*

Source: own computation using eviews; Where statically significant at 5% level of significant*

Diagnostic Test

R-squared = 0.7039

Adju-R-squar =0.5559

F-statistic = 4.755

Normality (Jarque-Bera) = 0.300

Heteroscedasticity,p-value=0.7355

The diagnostic test of the short run model for growth shows that the model is well specified. The Goodness of fit of the model (R^2) shows, 56 percent of a variation in the independent variable GDP is explained by the variation in the explanatory variables included in the model.

The lagged error correction term (ECMt-1) included in the model to capture the long run dynamics between the co integrating series is negative and between zero and one. The coefficient of this error correction term also implies that 28% of the deviation from its long run equilibrium is adjusted in one year or roughly takes about three years to close the variation.

Table 4.4 shows, foreign aid is statistically significant and it has positive effect on the growth of economy in the short run. Labor force in line with the theoretical expectation has entered with a positive sign and moreover it is significant. It shows that economically active labor force has played a role in promoting growth in the short run. Human capital proxy by education expenditure has a positive impact but it is insignificant in the short run; the reason is the return from human capita is time taking activity. Similarly domestic saving has insignificant role for growth of economy in the Short run which implies, the economy has necessitated increasing reliance on foreign aid to finance investment requirements of the country, or this means that it takes more years for aggregate savings to be transferred to productive investments than aid.

4.3 Long run saving Equation

A Long run saving Equation: Once the ADF unit root test result revealed that the series is I (1), a co integration test is performed to determine the rank of the co integrating vector. The rank of the co integrating vector is determined using the Johansen's maximum likelihood method. The test result (both trace and max statistics) rejects the null hypothesis of no co integration both at the 5 % and 1 % significance level. In other words, the null of at most one co integrating vector is not rejected which represents in table 4.5.

Table 4.5 Johansen's Co integration test results for saving equation.

Hypothesis		trace static				Hypothesis		Maximum egen test		
H0	Ha	Eigen value	λ trace.stat	5% critical	prob*.	H0	Ha	λ max.stat	5% crit.value	prob*
H0:r=0	HA:r>0	0.597	71.53*	69.818	0.0362	H0:r=0	HA:r=1	35.04*	34.80	0.046
H0:r=1	HA: r>1	0.360	36.942	47.856	0.350	H0:r=1	HA:r=2	16.96	27.58	0.58

Source: own computation using eviews

Where (**) means rejection of the null hypothesis at the 5% and r denotes the rank of the long-run matrix. It identifies the number of cointegrating vectors.

Hence, there exists single co integrating vectors which make up the long run relationship among the variables in the system see table 4.6

Table 4.6 Long run Saving Equation

Variable	Coefficient	t-statics
DLPCI	11.52051	4.11994*
DRI	0.126763	4.27226*
DLAID	-0.135072	-0.34089
DLX	-2.640880	-5.06720*
C	-79.99446	

Source: own computation using eviews

In the above table all variables are statically significant in the long run except foreign aid; which is found negative and statistically insignificant, thus indicates that foreign aid did not affect the saving ratio in Ethiopia in the long run. This result is in line with the findings of Ababa(2001). This could be probably explained by aid was used for consumption purpose rather than raising the level of saving and not able to adversely affect the saving rate but in the short run foreign aid has significant(appendix 3) support for saving in Ethiopia.

However, per capita income and interest rate are statically significant and has positive effect on national saving. Thus shows important determinants of national saving in Ethiopia in the long run. And also export is statically significant and it has negative effect on saving.

4.4. Causality Analysis

In this section, we employ the Pair-wise granger causality between saving and economic growth, aid and economic growth, and aid and saving. That is, to test for the presence and direction of causality. Since both variables of interest are I (1), a test for long run relationship is performed and the result shows that there is a single unique cointegrating vector constituting the long run relationship between saving and economic growth. Accordingly, Engle granger causality is estimated to discriminate the short run and long run causality between the variables.

A. Saving and Economic Growth

The null hypotheses are in two forms: growth rate of domestic savings does not granger cause the growth rate real GDP as well as the growth rate of real GDP does not granger cause the growth rate of domestic savings. On the other hand the alternative hypothesis state that the growth rate of domestic savings granger causes the growth rate of real GDP and the growth rate real GDP granger causes the growth rate of domestic savings.

Table 4.7 Pair wise Granger Causality between saving and GDP

Pair wise Granger causality test		
Lag 1, sample 39		
Null Hypothesis	F-statistics	Probability
LS does not Granger Cause LGDP	0.31472	0.5783
LGDP does not Granger Cause LS	16.7315	0.0002

Source: own computation using eviews

The results failed to reject, the null hypothesis that growth rate of GDP does not granger causes the growth rate of domestic savings at 5% significance level. Thus, the alternative hypothesis holds that the growth rate of GDP granger causes the growth rate domestic savings. So that, the direction of causality runs from the growth rate of real GDP to the growth rate of gross domestic savings. It is uni-directional. This result is consistent with the “Marx–Schumpeter-Keynes view” which implies growth lead saving and; Mohan (2006), which states that it is growth that causes saving. Moreover, the result is in line with the findings of Shimels (2015) in Ethiopia case.

B. Economic growth and Foreign aid

As can be seen from the table below, we reject the null hypothesis that LGDP does not Granger Cause LAID, but we fail to reject the null hypothesis that LAID does not Granger Cause LGDP. Therefore it is shown that granger causality runs one way from GDP to AID. Hence, causality is uni-directional from economic growth to aid. This shows that from donors' perspective, Ethiopian economy is determine the flow of aid. The performance of economic growth has a role to receive foreign aid.

Table 4.8 Pair wise Granger Causality between GDP & aid

Pair wise Granger causality test		
Lag 1, sample 39		
Null Hypothesis	F-stastics	Probablity
LAID does not Granger Cause LGDP	0.72791	0.3992
LGDP does not Granger Cause LAID	6.27092	0.0169

Source: own computation using eviews

C. Saving and Foreign aid

Table 4.9 presents the results of the Granger Causality between saving and aid. The results show that saving granger causes aid and aid granger causes saving. The empirical result confirms the existence of significant bidirectional causality between aid to saving. That is gross domestic savings granger causes foreign aid and there is a feedback from foreign aid. This result supports by the empirical finding of Bowles (1987) for the case of 20 countries.

Table 4.9 Granger Causality between Saving & aid

Pair wise Granger causality test		
Lag 1, sample 39		
Null Hypothesis	F-stastics	Probability

LAID does not Granger Cause LS	7.49218	0.0096
LS does not Granger Cause LAID	10.1041	0.0030

Source: own computation using eviews

Chapter Five

5. Conclusion and recommendation

Most developing countries, like Ethiopia, are characterized by low level of domestic saving and hence shortage of capital to undertake development programs. This in turn necessitates the country to rely on external finance from developed countries and donor organizations. Despite the massive literature on the subject, a consensus has not been reached by researchers regarding the impact of aid on growth and saving, rather the results are inconclusive.

As a result, the main objective of this study was to examine the direction of causal relationship between foreign aid, savings and economic growth in Ethiopia, using annual time series data from 1974/75 to 2013/2014. In the study, two equations, saving and growth equations have been identified and estimated using specifically, Johansen co-integration, VECM and Granger pair wise causality to determine the long-run and short-run relation between the interest variables and to ascertain the direction of causality. The time series property of the variables contained in the two equations is addressed through the test for stationarity and the result found that all the variables are stationary after first differencing. The main result of the study;

The result from the growth equation revealed that aid contributed positively to economic growth in the long run and short run. Therefore, aid is effective in promoting growth in Ethiopia in the study period. Moreover, both in the long run and short run domestic saving is insignificant on economic growth. This could be due to low level of savings which resulted from lack of continuous saving behavior in Ethiopia over time which is in return primarily attributable to the subsistence nature of the economy where output is barely enough for consumption. Export in Ethiopia has positive effect on economic in the long run.

The second equation developed is the saving equation. The result reveals that in the long run both per capital income and interest rate have positive and significant contribution to national saving. On the other hand, the result points out that aid has insignificant and negative effects on national saving in the long run while it has significantly positive influence in the short run in the study period. This implies that for the period under consideration, the role of foreign aid was negligible in improving the domestic saving in the long run and aid was used for consumption purpose rather than raising the level of saving for long run.

Further, the findings revealed the direction of causal relationship among the foreign aid, saving and economic growth using Granger causality tests based on pair wise granger causality framework suggests that the direction of granger causality is unidirectional from economic growth to saving and foreign aid. It shows that unidirectional causality run from economic growth to rate of saving but the reverse is not true; because of the fact that, high resource gap in Ethiopia and it depends heavily on foreign aid to meet its investment requirements, or saving in Ethiopia is insignificant to support economic growth in the study period. The result also reveals that, there is two way (feedback), granger causality between foreign aid and saving, which implies policies designed to stimulate domestic saving also facilitates foreign aid.

Recommendation;

- To maintain and accelerate growth, should formulate policies to intensify the allocation of foreign resources into investment projects.
- There is a need for strengthening of the country's institutions in order to ensure transparency and accountability.
- Policymakers should formulate and implement policies that promote economic growth, since such strategies will lead to higher growth in domestic savings.

Reference

- Abeba S. (2002), "Macroeconomic impact of external Assistance in Ethiopia", Unpublished M.Sc. thesis, AAU
- Andersn B. Economic Development in Ethiopia
- Bassam M. (2013) Foreign Aid and Economic Growth In Egypt And Jordan: An Empirical Analysis
- Boone, P., "The Impact of Foreign Aid on Savings and Growth." Working Paper, London School of Economics and Center for Economic Performance, 1994.
- Bowles, P. (1987). Foreign Aid and Domestic Saving in Less Developing countries: Some test of Causality. *World Development*. 15(6), pp.789-796.
- Budha(2012),A multivariate analisis of savings Investment and growth in Nepal. MpRA paper no.43346
- Chenery. H.B. and A.M. Strout (1966), "Foreign Assistance and Economic Development," *American Economic Review*, LVI, 4, September 679-733.
- Conchesta N. (2008), Foreign Aid And Economic Growth; The Case Of Tanzania.
- Dhanya J. (2015) The Impact of Savings in Economic Growth: An Empirical Study Based on Botswana
- Durbarry, R., Gemmell, N. and Greenaway, D(1998), "New Evidence on the Impact of Foreign Aid on Economic Growth." Centre for Research in Economic Development and International Trade, University of Nottingham, No. 98/8.
- Easterly W. R. Levine and D. Roodman (2003), New Data, New Doubts: Revisiting „Aid, Policies and Growth“, CGD Working Paper No. 26, June 2003, Centre for Global Development, Washington,
- FURI D.(2013) The Relative Role Of Foreign Aid And Domestic Resource Mobilizations As Strategy To Boost Economic Growth Of Developing countries.
- Griffin, K. (1970). Foreign capital, domestic savings and economic development. *Oxford Bulletin of Economics and statistics*. 18
- Gomanee K., Girma S. and Morrissey O. (2002), "Aid and Growth in Sub Saharan Africa: Accounting for Transmission Mechanisms", Research paper No. 2005/60, United Nation University.
- Gujarati D. (1995), "Basic Econometrics", McGraw-Hill, Inc. 3rd edition.

- Haile G. (2015); The impact of foreign aid on economic growth: Emperical evidence from Ethiopia (1974-2011) *Economics and International Finance (JREIF)* (ISSN: 2315-5671) Vol. 4(1) p Harris R.(195), *Using Cointegration Analysis in Econometric Modeling*, Prentice Hall/Harvester Wheat Sheaf. p. 1 - 12,
- Hem C. Basnet, C (2013) *Foreign Aid, Domestic Savings, And Economic Growth In South Asia* .
- Lean, H.& Song, Y. (2009).The domestic savings and economic growth relationship in China. *Journal of Chinese Economic and Foreign Trade Studies*, 2(1), 5–17.
- Kafayat A, Moyo B.(2013) *Savings and Economic Growth in Botswana*:
- Modigliani, F. (1970), "The Life Cycle Hypothesis of Saving and Intercountry Difference in Saving Ratio," in W. A. Eltis, M.F. Scott and I. N. Wolfe (eds.), *Induction, Trade and Growth: Essays in Honor of Sir Roy Harrod*, Clarendon Press, London.
- MoFED, (2010), "Bulletin of External Economic Cooperation", Addis Ababa, MOFED.
- Mohan, R.,(2006). Causal Relationship between Economic Growth and Gross Domestic Savings in Countries with different income levels. *Economic Bulletin*. 5(3), pp 1-12.
- Morrissey, O. (2001).Does Aid increase growth. *Progress in development studies*.pp.37-50.
- Okapanachi, Chidubem C (201) *Impact of foreign aid on saving in Naigeria*.
- Papanek G. (1973), "Aid, Foreign Private Investment, savings, and Growth in Less Developed Countries", *Journal of Political Economy* 81(1): 120-130.
- SengSothan. (2014). Causal Relationship between Domestic Saving and Economic Growth:Evidence from Cambodia. *International Journal of Economics and Finance*; Vol. 6, No. 9.
- ShahzebShaikh(2011) ; *Foreign Aid and Economic Growth Case for Pakistan (1972-2008)*
- Shimels k (2014) *savings, Investment and Economic Growth In Ethiopia*. *Journal oeconomics and international finance*.vol.10 pp232-248.
- Sintayoh F. (2006) *Impact of Conditionality on Aid Effectiveness In Ethiopia*
- Solow, R.M. (1956).A Contribution to the Theory of Economic Growth.*Quarterly Journal of* .70,PP. 65-94.
- TasewT. (2011) *Foreign aid and economic growth in Ethiopia*
- Tewodros (2015) *The Determinants Of Economic Growth In Ethiopia: A Time Series Analysis*.

Todaro M. (1994), "Economic Development", Longman Publishing Ltd, London and New York.

Vanarith C. (2009).The Effect of Foreign Aid on Economic Growth and Corruption In Developing Countries.

Voivodas, C. (1973).Exports, foreign capital inflow and economic growth.Journal of International Economics .3, pp.337-349.

Weisskoff, T.E (1972) 'The Impact of Foreign Capital Inflow on Domestic Savings in Underdeveloped Countries', Journal of International Economics 2(1): 25-38

Wondesen W.(2011), The Impact Of Foreign Capital Inflows On Economic Growth, Savings, And Investment In Ethiopia .

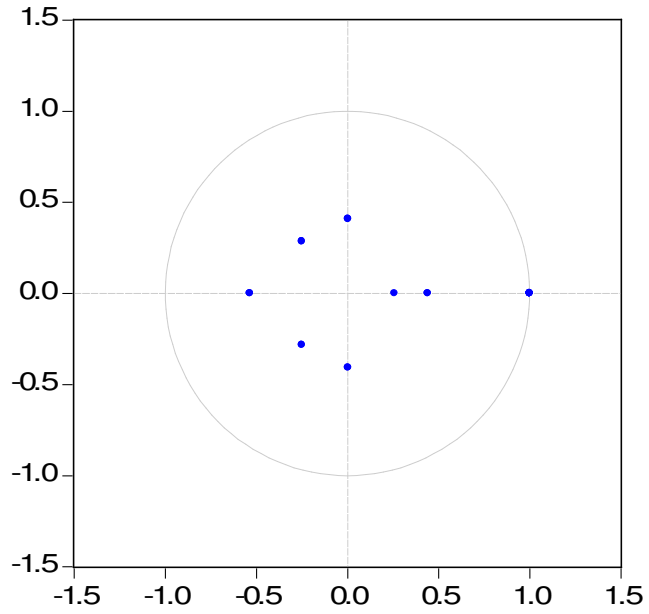
Yohannes B. (2011), The Impact Of Foreign Aid On Economic Growth In Ethiopia: Accounting For Transmission Mechanisms.

Appendix

1.

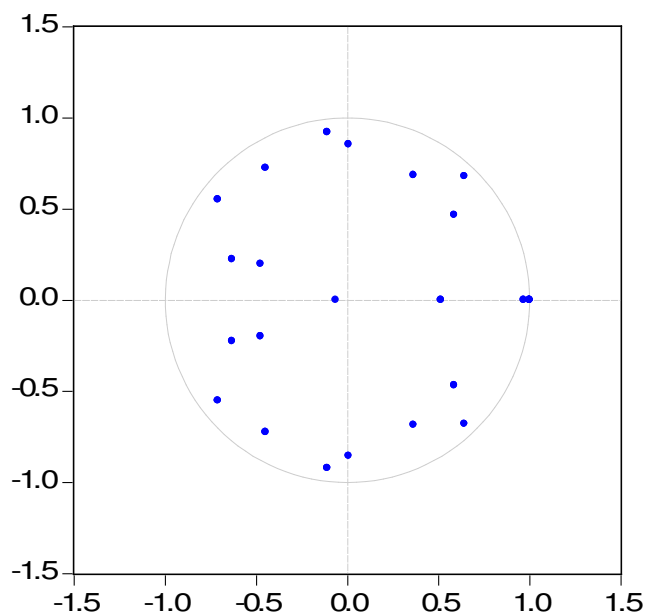
1. Inverse root AR characteristic polynomial for growth equation

Inverse Roots of AR Characteristic Polynomial



2. Inverse root AR characteristic polynomial for saving equation

Inverse Roots of AR Characteristic Polynomial



3. VECM estimation Saving equation

Error Correction:	D(LGNS)	D(LX)	D(LPCI)	D(LAID)	D(RI)
CointEq1	-0.018144 (0.03373) [-0.53791]	0.215282 (0.07677) [2.80430]	-0.015326 (0.00543) [-2.82361]	0.048782 (0.03468) [1.40679]	-4.528150 (1.65478) [-2.73640]
D(LGNS(-1))	-0.076000 (0.18737) [-0.40562]	0.547470 (0.42645) [1.28379]	0.077851 (0.03015) [2.58204]	0.050631 (0.19263) [0.26284]	11.47763 (9.19227) [1.24862]
D(LX(-1))	0.023551 (0.07396) [0.31844]	-0.178200 (0.16833) [-1.05866]	-0.018397 (0.01190) [-1.54586]	0.075790 (0.07603) [0.99680]	-5.080503 (3.62835) [-1.40022]
D(LPCI(-1))	0.644489 (1.01746) [0.63343]	-0.270846 (2.31569) [-0.11696]	0.246100 (0.16373) [1.50313]	0.178437 (1.04600) [0.17059]	-50.59777 (49.9159) [-1.01366]
D(LAID(-1))	0.366034 (0.16921) [2.16325]	0.212522 (0.38510) [0.55186]	0.049336 (0.02723) [1.81197]	-0.268206 (0.17395) [-1.54183]	10.84503 (8.30112) [1.30645]
D(RI(-1))	0.002874 (0.00351)	-0.013603 (0.00800)	0.001465 (0.00057)	-0.004244 (0.00361)	-0.117052 (0.17244)

[0.81755] [-1.70043] [2.58942] [-1.17459] [-0.67881]

4. Result of Causality

Pairwise Granger Causality Tests

Date: 06/03/16 Time: 16:40

Sample: 1 40

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LX does not Granger Cause LGNS	39	0.05704	0.8126
LGNS does not Granger Cause LX		19.5033	9.E-05
LPCI does not Granger Cause LGNS	39	0.10268	0.7505
LGNS does not Granger Cause LPCI		7.01214	0.0119
LAID does not Granger Cause LGNS	39	6.44583	0.0156
LGNS does not Granger Cause LAID		7.24444	0.0107
RI does not Granger Cause LGNS	39	1.11179	0.2987
LGNS does not Granger Cause RI		0.92802	0.3418
LPCI does not Granger Cause LX	39	5.16488	0.0291
LX does not Granger Cause LPCI		3.25358	0.0796
LAID does not Granger Cause LX	39	7.09009	0.0115
LX does not Granger Cause LAID		2.53643	0.1200
RI does not Granger Cause LX	39	0.11623	0.7351
LX does not Granger Cause RI		1.55418	0.2206
LAID does not Granger Cause LPCI	39	4.98299	0.0319
LPCI does not Granger Cause LAID		1.31812	0.2585
RI does not Granger Cause LPCI	39	0.00630	0.9372
LPCI does not Granger Cause RI		4.56577	0.0395
RI does not Granger Cause LAID	39	0.28859	0.5944
LAID does not Granger Cause RI		0.40872	0.5267

Declaration