SciencePG
Science Publishing Group

Effect of Foreign Aid on Economic Growth and Investment in Ethiopia

Moroda Kenea Duresa

Senior Research and Development, Awash Bank, Addis Ababa, Ethiopia

Email address:
Morodakn2016@gmail.com

Abstract: This study examined the effect of foreign aid on both economy and investment of Ethiopia from time 1974 to 2014. The empirical analysis has been done using multivariate co integration analysis of both vector autoregressive model (VAR) and (Vector error Correction model (VECM). Both models which enables to capture short run dynamics. VECM model is constructed by restricting long run behavior of endogenous variables for allowing for short run adjustment dynamics. The co integrating vector which is deviation from the long run equilibrium corrected through series of partial short run dynamics, which is known as error correction term The main findings of the study shown foreign aid has a significant positive effect on economic progress in both lengthy run and squat run. On other hands, aid has irrelevant and optimistic effect on gross domestic investment in both extensive time and short run. Further, the findings discovered that there is unidirectional causality among foreign aid to economic growth and foreign aid to gross domestic investment. Based on the findings the study recommends aid should be used to support the shortage of resource gap; also, aid should be focused on growth enhancing sectors as well as poverty reduction policies, then it will rise savings of societies'.

Keywords: Economic Growth, Investment, Foreign Aid, Gross Capital Formation, Co Integration

1. Introduction

1.1. Background

Ethiopia with an estimated number of 95 million people is the huge country in Africa. The population has been growing with 2.4 percent per year according to, the Ministry of Foreign and Economic Cooperation (MoFEC) 2013 report. Ethiopia is the predominantly by rural society approximately about 78 percent of the total population live in rural. It is also one of the poorest countries in the world where 29 percent of population is below poverty line in 2010. Ethiopian economy is very subsistence one which based on agriculture, which depend on climate condition.

Despite the Ethiopian economic performance was poor in the past years, it has recently shown improvement. According to Tasew [12], real GDP has been growing 11.2% per annum on average especially during 20003/04 to 2008/9 period, which put Ethiopia among the top economic accomplishment economies in Africa. However, there are challenges to sustain the profitable growth. Being highly dependent on economic growth in adequate rainfall and shortage of foreign currency. Other prominent factor explaining the Ethiopian economy is external component. Due to shortage of exported materials and high dependency on imported input of raw materials for investment (construction materials, fertilizers) and dependency on coffee which is unable to fill foreign exchange gap There is very strong correlation between Ethiopian economic performance and whether condition. The growth of the country which depends on agriculture should be linked with other sectors like industry in order to achieve sustainable economic development [9]. On the other hand, the resource gap is explained as presence of saving-investment gap, and fiscal gap. Currently, evidence shows that the saving – investment gap widens from 6 percent during the Derg regime (1974 to 1991) to 11.1 percent of the GDP in between (1991 to 2013).

Also the country's dependency on exporting limited primary agricultural product such as coffee makes the country foreign exchange gap. For example, export of goods and service during 2002 was about 15.5 percent of GDP where as the import of good and service was amount to 35.2

percent of GDP and led to in 19.7 percent foreign exchange gap. In the same ideology the country cannot finance for expenditure, or country cannot expand domestic economy with domestic revenue since country face budget deficit which shows that the country faces the fiscal gap. Due existence of widening of the above gaps i.e. gap of gross domestic investment- gross domestic savings, import and export gap (foreign exchange gap) and fiscal gap the country became dependent on external inflow of finance (foreign aid) in order to fill these gaps.

1.2. Statement of the Problem

The amount of foreign aid to the country has been increasing in alarming rate. For decades the relationship between aid, investment and growth is controversial, whether foreign aid is effective or not, according to some evidence showed by some researchers like Burnside and Dollar [2] and World Bank [15], foreign aid has positively impacted investment and economic growth with countries a good policy environment of good fiscal, monetary and trade policies.

The aid - growth study dominated by cross country regression studies relatively few in number of study on the area studied in Ethiopia. The studies argued that whether aid is effective or for persistent poverty in aid-dependent country is not the result of ineffectiveness of aid. There were controversial studies whether the effect of foreign aid has positive or negative impact on economic growth of Ethiopia or not. A study by Tesfahun [13] on impact of foreign aid on economic growth using secondary data of annual data covering the period 1960 to 2013 found that foreign aid has positive effect on long run and it became negative effect on short run. Also, by using Granger Causality method Tesfahun [13] found that presence of unidirectional causality from foreign aid to economic growth which shows aid is effective to promoting economic growth. But, the study is limited to only aid – growth rather than including aid – investment nexius. Another study by Fentaye [4] examined the impact of foreign aid on economic growth of Ethiopia through transmission channel (through investment) obtained that foreign aid has positive and significant impact in the long run, and the study also affirmed that foreign aid used to promote economic growth by financing saving gap. Therefore, this study used latest data and by filling drawback of above studies to examine the effect of foreign aid economic growth and investment of Ethiopia and identifies what measures to be taken by the government whether more foreign aid fund is needed or not in order to boost investment and economic growth.

1.3. Objective of the Study

The general objective of the study is to scrutinize the effect of foreign aid on economic growth and investment in Ethiopia. Specifically,

To examine effect of foreign aid on investment and economic growth in long run and identify its relationship,

1.4. Research Questions

What is the effect of foreign aid on economic and investment growth in Ethiopia?

1.5. Hypothesis

Foreign aid has a positive and significant impact on growth and investment of Ethiopia;

1.6. Significance of the Study

There limited number of study conducted in Ethiopia concerning impacts of foreign aid on economic growth and Investment, so further study is required. For this reason, in order to fill this gap, the study will necessary since the foreign aid is backbone of the Ethiopian economy.

1.7. Scope and Delimitation of the Study

The study is delimited to the period 1974 to 2014 since the data will be available for most of these periods. Even though the study tried the impact of foreign aid on economic growth, investment, it has different limitation. Some of such limitations were: inconsistency of data from different source and lack of data. The study use aggregated secondary data and there for delimited in the extent to which impact will be fall in short term and limited variable.

2. Review of the Literature

2.1. Theoretical Literature: Foreign Aid, Investment and Economic Growth

According to Harrods - Domar growth model, the main objective of foreign aid is filling the saving gap then improve amount of investment then led growth, which implies the main purpose of aid is investment. Harrod-Domar gap model assumption shows the relationship between output (Y) and capital (K) which is formula as:

$$Y = K/v \qquad (1)$$

Where, V is capital output ratio or incremental capital output ratio (ICOR), which implies that output growth will be the function of investment. Harrod –Domar model conclude that the constraints of saving is the binding limit of growth i.e domestic saving alone cannot achieve the investment level which can attain the necessary growth level, implies that growth is constrained by saving gap (shortage actual savings from the desired level) For this reason, the role of foreign aid to fill saving gap and support domestic saving to achieve the targeted rate growth is crucial.

According to the Gap theory of Harrod – Domar model, $\acute{Y}/Y = \frac{K'}{vY} = I/vY - \delta$, where $\acute{Y} = \partial Y/\partial t$ implies variables change over time, δ depreciation rate. Current Output is predetermined by past investments.

In other ways:-

$$I = S_p + (T - G) + (M - S) = S + F \qquad (2)$$

Where Sp is private saving, F is, Foreign saving, which is foreign aid.

So, the Gap theory also state that when desired level of investment is fall below I^{sp} we call it there is saving Gap.

$$I^{sp} \leq S + F \qquad (3)$$

Also, the role of foreign aid inflow is important to increase the level of import, where the level of export is insufficient balance the amount of import that required achieving the targeted level of growth.

Therefore, foreign exchange gap assumption, if there is desired level of investment is below I^{FG}

$$I^{FG} \leq 1/m [(X-M) + F] \qquad (4)$$

Where, m is all capital goods imported from abroad
X = export
M = amount imported,

The combination of both above saving and foreign exchange gap which is Two- Gap model act as constraints that limit growth, so inflow of foreign fund (aid) is used to fill these gaps (Chenery and Strout, 1966). Which implies that the desired level of rate of growth cannot achieved if foreign aid not financed.

2.2. Empirical Literature

2.2.1. Foreign Aid and Economic Growth

The macro economic impact of foreign aid is very controversial issue to conclude. The impact of aid on economic growth in developing country has been discussed in different time and topics.

Researcher like [17, 18], examined relationship between the foreign assistance (aid) and economic growth and they found that the relationship is inconclusive. Only one study showed, foreign aid has no impact on economic growth. The others argue that the aid impact is positive or negative. Gong and Heng-fu [19], also found the negative relation between aid and economic growth. The negative aid – growth relation follows from Griffin and Enos [6, 20, 21].

Dowling and Hiemenz [3] examined the relationship between foreign aid, savings and growth with policy variables. Their sample of study consists of 52 Asian countries between the years 1968 to 1979. Using the OLS method of data analysis they found that all of the variable i.e. foreign aid, saving and policy variables have positive and significant relation with the economic growth. Battarai [22] also examined the effectiveness of foreign aid and its link with saving, investment and per capital income growth in Nepal using time series data from periods 1970 to 2002, by using co integration and error correction mechanism, found that aid has effective positive and significant relationship with per capita GDP, savings and investment in long run and negative integrated on growth in short run. He also concludes that aid effectiveness depend on good policy environment.

2.2.2. Foreign Aid and Domestic Saving

Papanek [10] and Newlyn [16] found that there was negative association between the foreign aid and saving They said foreign aid was used for consumption and its impact on domestic saving was negative' *ceteris paribus*. As to the o additional study by Papanek [11] found that foreign aid has very significant effect than other variables. The study has also coined that aid is used to fill the saving and foreign exchange gap.

2.2.3. Foreign Aid and Domestic Investment

According to the separate study, Levy [7] examines the relationship between aid and economic growth in Sub-Saharan Africa and finds a significant positive correlation between aid and investment as well as between aid and economic growth in Africa.

Mehdi and Masoud [8] examine the impact of foreign aid on investment (both public and private investment) of Iran by using the data during the 1972 to 2007 by analyzing model of vector of autoregressive (VAR) found that foreign aid has negative effect on gross domestic product and positive impact on private investment, also public investment is negative relation with private investment. The result also shows that foreign loan has negative effect on gross domestic product and positive effect on private investment.

Since the above controversy around the aid – growth nexus, but the macroeconomic rationale for foreign aid conclude that it supplement domestic saving, fill foreign exchange and government revenue, contributing high growth[1].

2.2.4. Empirical Studies of Aid, Saving, Investment and Growth Literature in Ethiopia

Ethiopia's economy is characterized massive flow of foreign aid, there is only few study investigated in Ethiopia concerning impact of foreign aid on economic growth.

Alemayehu [1] examined the relationship between savings, foreign aid and economic growth and found that foreign aid is negatively associated with private saving, and concluded that the most important determinants of private saving is GDP per capita, investment (both public and private) is the main determinants of economic growth.

To the contrary, Girma [5] analyzed the impact of foreign aid on economic growth of Ethiopia for the period from 1974 to 2011 using autoregressive distributed lag model (ARDL) found that foreign aid has significant negative impact on economic growth of Ethiopia.

2.3. Origin and Aid Inflows to Africa

Some scholars argued that poverty in Africa is due to combination of shortcoming of policy, institutions and physical and human infrastructure. So, in order make African economy to transform it is necessary to overcome such gaps by supplying aid which is critical to attain African sustainable development. Aid flows to Africa during last four decades did not have achieved the African economic transformation. In only some countries like Tunisia which is

---

1 According to Alphas Victor Ojiambo(2009), study on Effect o f foreign aid predictability on investment and economic growth in Kenya, Kenyatta University, Kenya(2013).

relatively better to accompanied economic transformation due to sound policy to promote investment, export promotion and economic diversification [14], on contrary there was findings that shows the reverse result.

Additionally, many researches show that aid has been largely driven by motive support to family consumption and had little impact on economic transformations. Absence of notable relationship between foreign aid and structural change in Africa especially lack of appropriate policies to allocate these aid. If the policy environment improves foreign aid more likely to follow with greater impact on growth and economic transformations through productivity enhancement, technology transfer, and allocation of resource in more necessarily sectors [23].

2.4. Over Views of Gaps of Ethiopian's Macroeconomic Performance

2.4.1. Overall Trend of Real GDP and Reforms

Ethiopian economic data are generally incomplete, inconsistently reported especially for periods before 1974s, so I will try to organized time series data for periods starting from 1974 to 2014 from different sources[2]. The economic performance of Ethiopia is high linkage with political framework and economic reforms. The time before 1974 and post Derg period (since 1991) macroeconomic policy is widely led by market oriented economic system, whereas, the period 1974 to 1991 (Derg regime) the economy is dominated by centralized economic system.

The economic performance during imperial period is 4 percent per annual while the growth of average GDP per capita was 1.5 percent. After 1975, Derg come to power which is characterized by centrally planned economic system, harsh and very strong military power and prevent against private property ownership and entrepreneurship right. The economic performance during the Derg regime was poorer than the Imperial regime with negative growth of per capita income which was the result of drought and civil war.
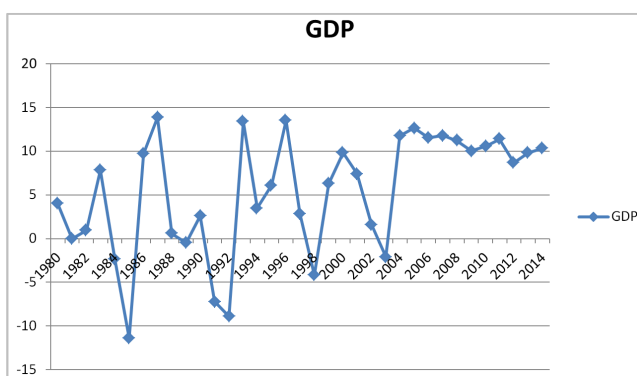

Figure 1. Trend of Real GDP of Ethiopia from (1980 – 2014).

Source: Data based on from IMF, international world economic Outlook, October, 2015.

---

[2] The growth level that reported by different source different (mostly insignificant) from those reported in official publications among MOFED and IMF.

During the Derg regime, the average of GDP growth was 1.9 percent per year, whereas the average of population growth of 2.8 percent per annum that makes to decline in per capital income [9]. During the crisis years (1984 to 85) when average of GDP felt about -6.45 percent and during 1991 to 1992 when Ethiopian economy fallen significantly averagely -12.52 percents) are included, however, the GDP Grew annually by 2.6 percent during 1980 to 1990 (see figure 1 above). According to IMF the annual average growth rate of real GDP for 1970 to 1998 was 2.86 percent where population growth rate was estimated at 2.5 - 3.0 percent annually. On the other hand, the record on macroeconomic stability has been different. The inflection rate sometimes exceeds single digits (annual average of 7.8 percent for 1980 to 1998) and fiscal deficit was kept with manageable level.

Under Ethiopian Revolutionary Democratic Front (EPDRF) regime (1992/93 to 1999/0, the growth rate of GDP was increased on average 7.2 in percent per annum with population growth of in average of 2.6 percent. Despite, the consequence of the Ethio – Eritrea war which made significantly reduce progress of economic growth of Ethiopia during 2001/2002 and 2002/2003 which GDP growth fall to 1.5 and -2.2 percent which was below average of economic growth during 1991/1992 to 1998/199 which is annual average of 3.6 percent (see above figure 1). According to the MOFED 2013/14 economic performance report over the eleventh consecutive annual years, (during 2004 to 2014) the Ethiopian economy annual average of growth rate of GDP was 10.9 percent.

In Ethiopian economy, the economic growth performance of the economy is mainly determined by (dependent on) performance of agriculture, which is highly exposed to the nature, which implies that strong agricultural performance reflect high economic growth. The contribution of agriculture to growth has increased significantly from the periods of Derg regime but the industrial sector to contribution to growth also grew insignificantly.

Table 1. The sectoral decomposition of Share GDP.

periods	Total GDP Growth rate	Agriculture	industry	services
1975- 1991	1.99	55.57	11.44	32.97
1992 - 1999	5.04	47.7	11.8	38.06
2000 - 2014	9.4	45.7	12.4	42.8

Source: Own computed from Ministry of Finance and economic development (MOFED), 2015.

Above table shows that agriculture very dominant components of GDP over two eras, i.e the share of industrial sectors to GDP was 11.44 and 11.8 percent in Derg regime and in post reform regime of EPDRF shows that the change in percentage share in industrial sector is relatively fall. In the distribution of the service sector, the sector shows the slight incremental in post reform regime than Derg regime. Overall evidence shows that sectoral composition of GDP haven't no much change in share of output composition over 40 years (See figure 2 below).
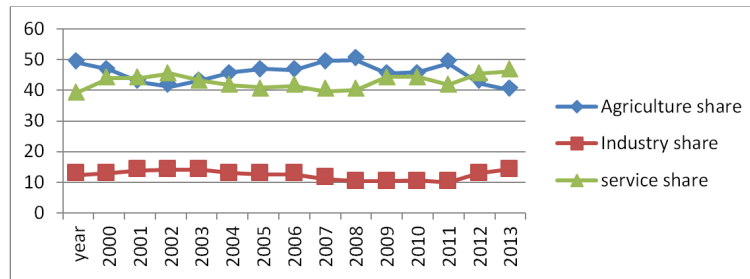
Source: Data based on from MOFED annual report

Figure 2. The Sectoral decomposition of Share GDP.

Dependency on rain- fed agriculture has very high consequence on overall performance of agricultural based economy, like Ethiopia. According to Alemayehu [24], rain fed agriculture has negative multiplier effect on production levels from consecutive/subsequent years; i.e shock in one period year has multiplicative effect on the next consecutive coming years.

Even though, agriculture takes the great place in the share of GDP, industrial and the service sectors, also play their own role in economy growth. Since agriculture remain as the main engine of economic growth with almost 50 percent of GDP of Ethiopia, its share started to slightly decline below 50 percent from period 1999/00 where still agriculture sector constituted major share of GDP. Averagely the agriculture, service and industrial sector constitute 51.7, 35.6 and 11.6 percent of GDP respectively. From the time after millennium development (2000 to 2014), the share agriculture declined, which is 45.4, 12.4 and 42.8 percent agriculture industry and service, share as the average composition GDP respectively. Even though the amount agriculture share decrease slightly the fall in agricultural still product directly shock the real GDP growth.

2.4.2. Saving and Investment Gap

The positive and sustainable economic development of the countries is significantly influenced by the rate of savings and investments. According to neoclassical growth theory, capital formation is crucial for economic growth, but developing countries' growth is constrained by a serious lack of capital. Like other developing countries, Ethiopia has also faced always by shortage of domestic investment and domestic savings which shows presence of saving -investment gap made the countries dependent on external aid. There is the divergence between gross domestic saving and gross fixed investment which shows that the widening the gap of saving and investment. It was the periods between 1982 to 1988, the period in which gross domestic saving and gross fixed capital formation goes in parallel dimension; where gross domestic investment (%GDP) fall to the lowest 4 percent and gross fixed capital investment (%GDP) raised to the top about 28 percent, which implies that there is huge gap between gross domestic saving and gross fixed capital investment (See figure 3 below).
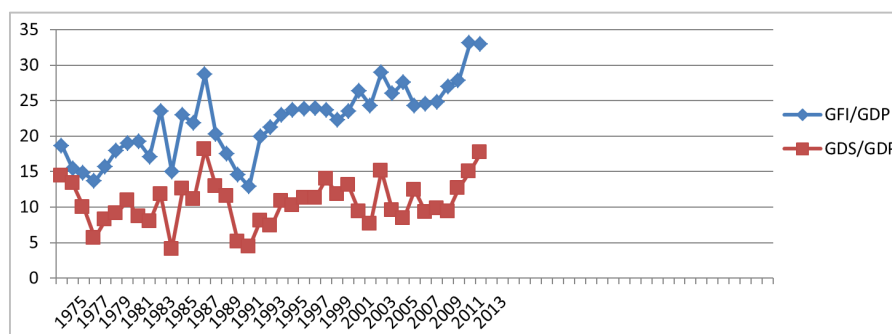
Source: Based on data from MOFED January, 2015

Figure 3. Gross Fixed investment (GFI) and Gross domestic saving (GDS) as percent of GDP in Ethiopia (1974 to 2014).

During 1974/5, the ratio of saving to GDP shows significantly fluctuated. The average of gross domestic saving and gross fixed investment as percentage of GDP for the Derg era was 7.3 and 13.2 percent respectively. This figure shows that there great different gap between savings and investment ratio, which implies that the investment ratios exceed the saving ratio. During this period the different gap between domestic saving and domestic investment averagely about -5.9 percent of GDP [9].

Even though domestic saving rate was showed increased

during the EPDRF period, by some measure of government, but overall, in current situation the saving rate is lower to catch sustainable economic growth, the resource gap has been also increasingly, gross domestic saving and gross domestic investment ratio to GDP is 5.4 and 15.1 percent respectively, and the gap is 9.7 percent of GDP. This Gap resulted fluctuation is formed due to lack of saving 'dis-saving' of government and increasing consumption or expending on expenditure than saving.

Table 2. *Saving and investment as percent of GDP in Ethiopia.*

Years	Gross domestic saving	SSA	Gross domestic investment	SSA
1980 - 89	10.41	22.17	15.71	19.3
1990 - 99	9.7	14.49	16.4	17.85
2000 – 2008	6.4	24.72	22.88	17.81
2009 - 2014	24	18.5	28	17.7

Source: computed from IMF data base.

As shown from above table we can say that there is saving – investment gap that makes the country on external aid, this is due to poor saving culture and growing the investment demand which country needs to achieve sustainable economic growth. The table also shows that saving and investment gap is widening, and movement of saving and investment in opposite direction. According to the World Bank [15], Ethiopian's ratio of GDS to GDP has been lower with compared to other sub-Sahara Africa, averagely, it was 16 percent in 1970's and 14 percent in 1991's after transition period Ethiopia became made the surprising growth in both gross domestic investment and gross domestic Saving with comparisons with SSA (table 2).

2.4.3. Balance of Trade

As clearly shown in the table below, there was divergence between import and export in terms of their share to GDP.. For instance, it was between 2003 to 2010, the exchange gap was highly fluctuated. The percentage of export has fallen to the lowest about 10 percent while the import of goods and service has increased to the peak about 37 percent, which the amount of import was about four times that of export.

Table 3. *Export and Import performance as percent of GDP.*

Period/type	Export	Import	Export/import (%)	Growth of export	Growth of import
1974/75 -1991/92	6.04	10.8	56.28	5.2	1.3
1991/92 - 2008/209	11.36	23.6	48.6	5.25	6
2008/2009 -2014/15	13.8	31	44.5	1.47	3.3

Source: Data from National Bank of Ethiopia (NBE).
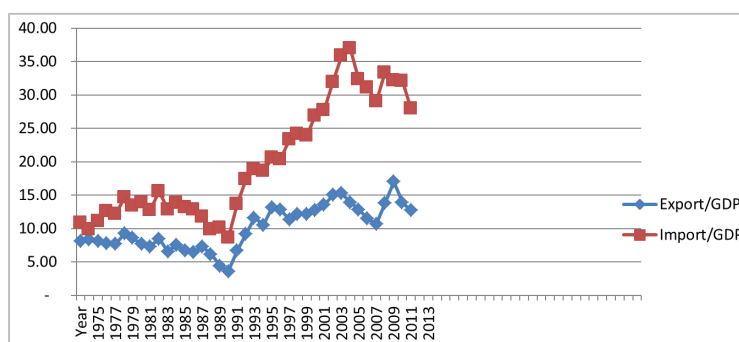
Source: Data based on MOFED, October, 2015

Figure 4. *Import and export performance of Ethiopia (% GDP) from (1980 – 2014).*

Export performance from the period (1974/75 – 1991/92) was poor which is only six percent of the GDP on average. During the incumbent regime the export performance relatively better which was 11.4 percent of GDP on average. During the Derg regime the export share to GDP was 5.2 percent while and import accounts 1.3 percent. Empirical evidences show that there is a wide gap between export and import. This gap has been filled by foreign aid (either loan or grants) which poses debt burden on the country.

The ratio of the total export to import during the Derg regime was declined from 56.28 percent to 48.6 percent between 1991/92 – 2008/09. The figure has also further fallen to 44.5 percent from 2008/2009 to 2014/15 due to the fall of commodity prices at the international market and the increased amount of imported goods.

Over all the trends of trade balance since 1994 to recent generally negative, implies that the amount of imported commodity was very high with the comparison of exported goods by suggesting trade balance is continued by falling rate. The growth of export Ethiopia which is falling implies that for the country accumulated debt service became increasing from periods to periods.

2.4.4. Government Account

According to Tasew [12], when the Derg regime in power, government revenue had strongly significant positive trend where total revenue was growing by 8.03 percent on average and total revenue excluding the grants was also growing almost in similar trend 8.4 percent on average, but the strong growth of the total revenue became decline between periods 1989/90 and 1999/2000 when tax

revenue fall -16.43 and -19.67 percent respectively. This fall implies the period became Ethiopian depression period

when there is administrative and political problem to collect tax faced.

***Table 4.** Government revenue (in million Birr).*

	Total revenue with grants	Total revenue without grants	Tax revenue	Tax revenue (%GDP)
1974/75 -1991/92	2,433.4	2,118.4	1,533.9	8.32
1991/92–2008/2009	16,152.1	12,837	9,374.4	9.36
2009/10 - 2012/13	101,174.94	87,480.57	73,761.58	11.91

Source: Authors computation from NBE data.

From above table it shows that from period 1991/92 to 2008/09, the government revenue including grants raised to 12837 from an average of 2118.4, in the same analogy total government revenue and tax as percent of GDP also increased from EPDRF regime. The data also shows that the growth of the total revenue including tax and tax as percentage of GDP was 8.32 and 9.36 from 1975/75 to 1991/92 and 2008/2009 respectively then to 11.91 from 2009/10 - 2014/15. The increase of the total revenue was the resulted the increased public investment and role of private sector.

2.4.5. Trend, Magnitude of Foreign Aid Flow to Ethiopia

The total aid flow has been continuously increased comparatively under current economic system because of change of political economic system match with the interest donor's countries and institutions. During the period (1991/92 to 2008/09), the aid flow has been grown to 10.8 billion Birr by annual average and its share of the GDP also raised to 13 percents from which was 4.8 percent in the Derg regime.
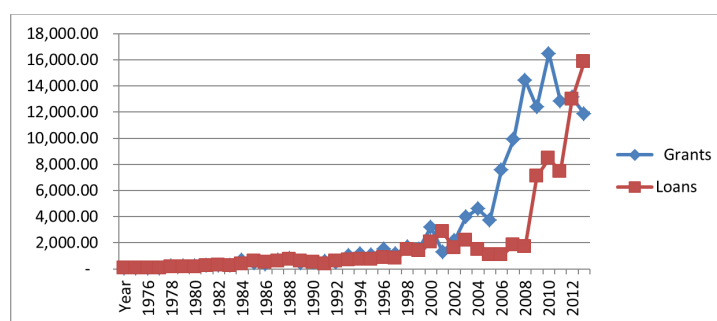
Source: Data based on MOFED, data base, January, 2015

***Figure 5.** Total Foreign aid (loans +Grants) received in Million Birr of Ethiopia (1974 - 2014).*

Official development assistance to Ethiopia is either loan or grant aid in components. From the volume 11185 million Birr of foreign aid during 1974/75, grants constituted about 48.1 percent which was about 5375.5 million Birr and loans were about 51.9 percents which accounted to 5809.6 million birr. The amount of both loans and grants were almost approximate to similar during

the Derg regime. The volume of aid also became increased to 20182.9 million birr from the periods of between 1991/92 to 1999/00 in which more than 50% of foreign aid was in the form of grants. Then after 2009/10 the amount of grant was raised to about 65% of foreign aid, the amount of foreign loan declined to only 35% of total external aid.

***Table 5.** Foreign aid as percentage share of macroeconomic variables of Ethiopia.*

Item/periods	1974/75 – 90/91	1991/92 – 199/00	2000/01 – 2012/13
External Assistance as % of			
GDP	5.1	6.4	4.9
Total revenue	25.2	33.4	26
Total Expenditure	19.3	25.6	19
Imports	33.8	29.5	16.4
Investment	38.8	41.9	18.7

Source: Computation from data obtained from NBE.

3. Research Methods

3.1. Definition and Basic Concepts

Foreign aid is transfer of resource from developed countries (DC) to less developed countries (LDCs) on

favorable terms. LCDs countries are heavenly dependent on external resources to expand productive capacity of their economies. In response to the demand for the transfer of resource by developing countries, developed countries (donors) have provided financial support in found that aid.[3]

---

3 In this proposal the "Foreign Aid" and "Aid" are used as interchangeable terms.

3.2. Model Specification

In related with the theoretical and empirical proposed in the above literature, the impact of foreign aid on saving, investment and economic growth would be examined using the following three equations.

3.2.1. The Growth Equation

Production function under endogenous growth theory can formulated as:

$$Y_t = f(K_t, L_t, HC_t)$$

Therefore, for the propose of this study, the following models were developed as follows: -

$$GDP = f(AID, FDI, S, HC) \qquad (5)$$

Where,
GDP = real gross domestic product
AID = foreign aid as percentage of GDP
FDI = foreign direct investment as the percentage of GDP
S = gross domestic saving as percentage of GDP
HC = human capital proxied by educational expenditure
Taking the natural logarithm to all the growth equation can be rewritten as:

$$LGDP = \alpha_o + \alpha_1 LAID + \alpha_2 LFDI + \alpha_3 LS + \alpha_4 LHC + U_t \quad (6)$$

Where L represents the natural logarithm of the respective variable and U_t is the error term.

3.2.2. Investment Equation

Domestic investment will be financially constrained by domestic saving and resource flowing to the country from abroads:

$$I = f(St, RFt) \qquad (7)$$

Where,
I = Aggregate investment
S = Gross Domestic Savings
RF = Net Resource Flows
The investment function can be expressed as:

$$I = f(S, AID, FDI, INFL, DX) \qquad (8)$$

Where,
I = is gross investment as percentage GDP
S = gross domestic saving as percentage of GDP
AID = foreign aid as percentage GDP
FDI = Private investment as percentage of GDP
INFL = Annual average of inflection
DX = share of debt service to export
So, the model estimated is specified as follows:

$$I = \beta_0 + \beta_1 S + \beta_2 AID + \beta_3 FDI + \beta_4 INFLE + \beta_5 Dx + E_t$$

Where, B's are regression coefficients and E_t random errors or random walks.

3.3. Data Types, Sources

In order to examine the effect of foreign aid on economic growth and investment in Ethiopia, data covering from the period 1974 to 2014, to be used. The major data source for the study was from Ethiopian National Bank (NBE), Ministry of Finance and Economic Cooperation (MOFEC), Central statistical agency (CSA), World Bank and Africa Development indicators data base, Economic Corporation and Development (OECD), International monetary fund (IMF) International Financial Statistics, Economic Survey and WDI.

3.4. Methodology of the Study

In order to achieve the above mentioned objectives above, by applying quantitative approaches, use two models of investment and growth equation, using STATA 13. test.

3.4.1. Testing for Unit Root

$$Y_t = \delta Y_{t-1} + U_t \qquad (9)$$

But, if the value of δ is greater than or equal to unity the process is not stationary. ($if\ \delta \geq 1$)
Then the equation (9) can be written as a trend as follows:

$$\Delta Y_t = \alpha Y_{t-1} + U_t \qquad (10)$$

Where, $\alpha = (1 - \delta)$
So, hypothesis is the null hypothesis $\delta = 1\ is\ equavalent\ to\ Ho: \alpha = 0$,
But, since DF methods assume the data generated followed by auto regressive order on (AR (1)) which biases the test in presence of serial correlation, the shortcoming of using many lag value should be advised by using ADF. The advantage of using ADF is eliminating autocorrelation. Even though the ADF is seems to DF, the model is:

$$\Delta Y_t = \alpha Y_{t-1} + \sum Y_j\ Y_{t-j} + U_t \qquad (11)$$

Then the null and the alternative hypothesis of ADF is $H_o: \delta = 0$, $H_1: \delta = \alpha - 1$ implies that reject hypothesis if the time series is stationary or not contain unit root, otherwise accept it, time series is not stationary.

3.4.2. Co-integration Test: Johansen Maximum Likelihood Procedure

Vector Autoregressive (VAR) is the multivariate modeling procedure, in which testing more than one co − integrating vector and where no need of classification variables as exogenous and endogenous is necessary. Given n endogenous variables, it can be modeled X_t without restricted VAR with p Lags of X_t as:

$$X_t = A_1 X_{t-1} + A_2 X_{t-2} + ... + A_P X_{t-P} + U_t \qquad (12)$$

$$U_t \sim IN(0, \Omega)$$

Where, $X_{t =}$ (nx1) matrix,
A_i = (nxn) matrix of parameters and
U_t = independently and identically distributed n dimensional vector with 0 mean and variance Ω.

By re- parameterized the above equation to give the vector of error correction model (VECM) by adding and subtracting $(A_{k-1} ... A_2 - A_3 - I) X_{t-k}$ from equation (12) where I is identity matrix, results the following equation:

$$\Delta X_{t} = \pi 1 \Delta X_{t-1} + \pi 2 \Delta X_{t-1} + ... + \pi k - 1 \Delta X_{t-k+1} + \gamma X_{t-k} + \tau D_t + \mu + \varepsilon_t$$

By simplifying,

$$\Delta X_t = \sum_{i=1}^{k-1} \pi i \ \Delta X_{t-1} + \gamma_j X_{t-k} + \tau D_t + \mu + \varepsilon_t \qquad (13)$$

Where $\pi_1 = - (I - \Sigma A i)$, is short run adjustment while γ long run information to change in X_t, D_t is vector dummies, intercept and predetermined exogenous variables.

Two test statistics which are λ_{trace} and λ_{max} are used to test the number of cointegrating vectors based on characteristic roots. Both λ_{trace} and λ_{max} Statistics are calculated by:

$$\lambda_{trace = -T} \sum_{i=r+1}^{n} ln(1 - \lambda'_i), r = 0,1,... \text{ n-1} \qquad (14)$$

$$\lambda_{max} = -T ln(1- \lambda'_{r+1}) \qquad (15)$$

Where T is sample size, λ_I is estimated Eigen values.

λ_{trace} statistics test null hypothesis the number of co integrating vectors is less than or equal to r against the alternative of (r +1).

Where, λ_{max} statistics on other hand, the number of co integrating vector is r against alternative (r+1). Both statistics follows chi- square distribution.

On other words if there is long run relationship among the variables, we can use Vector of Error Correction Model (VECM), which enables to capture short run dynamics. VECM model is constructed by restricting long run behavior of endogenous variables for allowing for short run adjustment dynamics. The co integrating vector which is deviation from the long run equilibrium corrected through series of partial short run dynamics, which is known as error correction term.

4. Results and Discussion

This chapter presents the findings of the study. The section 4.2 presents unit root test, section 4.3 and 4.4 contains estimation of both long run and short run of growth and investment equation with their respective diagnostic testing results. Section 4.5 and 4.6 presents Granger causality test and finding of the study respectively.

4.1. Unit Root Test

Table 6. *ADF unit root test for variables in growth equation.*

Variables in level		C &T	C	NCT
LRGDP		-3.50	-1.30	-1.48
LS		-3.48	-2.84	-0.93
Laid		-0.71	-2.18	-0.49
LHC		-1.47	-1.64	-0.15
LFDI		-2.00	-1.89	-1.46
Variables in first difference				
LRGDP		-5.10	-5.16	-0.4.77
LS		-4.32	-4.33	-4.34
Laid		-5.09	-3.98	-4.02
LHC		-4.71	-3.78	-3.52
LFDI		-5.76	-5.79	-5.88
Critical	1%	-4.27	-3.67	-2.641
values	5%	3.55	-2.97	-1.95

Table 7. *ADF unit root test for variables in investment equation.*

Variables in level		C &T	C	NCT
GI		-3.19	-0.69	-1.23
AID		-2.25	-2.51	-0.66
DS		-2.48	-1.71	-1.13
INF		-1.85	-1.74	-1.07
FDI		-2.78	-2.06	-2.52
DX		-2.19	-1.82	-0.89
Variables in first difference				
GI		-4.82	-4.79	-4.34
AID		-6.12	-5.92	-5.99
DS		-4.52	-4.36	-4.38
INF		-4.62	-4.41	-4.49
FDI		-7.98	-5.19	-6.08
DX		-5.16	-5.02	-5.10
Critical	1%	-4.27	-3.67	-2.641
values	5%	3.55	-2.97	-1.95

Note that: D represents first difference of time series variables, C&T represent both constant and trend, C shows constant only no trend, NCT stand for neither trend nor constant.

4.2. Growth Equation: Long Run Equilibrium and VECM

4.2.1. Long Run Equilibrium

The result of the test is compare (λ_{trace} and λ_{max} statistic) reject the null hypothesis for no co integration level both at 1% and 5% significance level.

Table 8. *Johansen's co integration test for growth equation.*

Ho (Null HYP)	H1 (Alt HYP)	Eigen value	λ_{trace}	5% crit.value	1% crit.value	λ_{max}	5% crit.value	1% crit.value
r≤0	r=0		98.4821	68.52	76.07	46.1410	33.46	38.77
r≤1	r=1	0.72243	52.3412	47.21	54.46	30.5547	27.07	32.24
r≤2	r=2	0.5721	21.7864[**]	29.68	35.65	15.8092[**]	20.07	25.52
r≤3	r=3	0.3554	5.9773.	15.41	20.04	5.4858	14.07	18.63
r≤4	r=4	0.1413	0.4915	3.76	6.65	0.4915	3.76	6.65

Note: [**] denote rejection of the null hypothesis at 1% and 5% significance level respectively. The optimal lag length two is used to test co integration which is calculated according to lag length four Akakie Information criteria (AIC).

Table 9. *Normalized long run β coefficients for growth equation.*

Variables	LRGDP	LS	Laid	LHC	Lfdi
Estimated coefficients	1	-0.26195	0.63467	0.91893	-0.02369

Table 10. *Adjustment (α) coefficients for growth equation.*

Variables	Adjustment coefficients
LRGDP	-0.20296
LS	-0.43361
Laid	-0.23832
LHC	0.43854
LFDI	-0.63270

The above value of except coefficients LHC, of α that is obtained from co integration explains that the speed of the adjustment of long run parameters toward steady state and the deviation from the long run equilibrium.

Table 11. *The result of significance tests for (α) coefficients.*

variable	LRGDP	LS	Laid	LHC	LFDI
α	-0.20296	-0.43361	-0.22832	0.43854	-0.63270
z	-5.11	-2.21	-1.24	-0.64	-0.64
P-value	(0.000) ***	(0.027) ***	(0.216)	(0.1541)	0.522

Note: *** represents rejection of coefficients (α) at 5% level of significant.

The above table test result indicated that coefficients (α) of both LRGDP and Log investment are rejected at 5% level of significant. This enables us to analyse the long run equation. Similarly imposing the zero restriction on β coefficients enable to identify which variables are statistically significant.

Table 12. *The result of test significance (β) coefficients.*

Variable	LS	Laid	LHC	LFDI
Coefficients- β	-0.26195	0.63467	0.91893	-0.02369
z	2.15	-6.58	-32.42	1.82
P-value	(0.031)***	(0.000) ***	(0.000) ***	(0.236)

Except, LFDI long run coefficients the explanatory variables (shown in table 12 above) all are significant coefficients different from zero, which allows that estimation of long run growth equation.

The estimated long run equation is presented as follows: -

$$LRGDP = -0.26195LS + 0.63467Laid + 0.91893LHC - 0.02369LFDI$$

$$SE: \quad [0.122] \quad [0.96] \quad (0.28) \quad [0.20]$$
$$P-value: \quad (0.031)^{**} \quad (0.000)^{***} \quad (0.000)^{***} \quad (0.236)$$

Vector AR 1-2 chi2 (1) = 1.68(0.195)

Vector Normality: Chi2 (2) = 11.27(0.194)

In order to check the validity of the model, the diagnostic test shows that the long run equation is adequate and acceptable because the null hypothesis which has no serial correlation has not been rejected at 5% significant level. Additionally, the test for normality has also confirmed that the errors are normally distributed and null hypothesis is not rejected.

The above long run regression equation confirmed that the foreign aid has positively and statistically significant effect on real GDP growth. It shows that one-unit increase in log foreign aid would cause to the increment in the Log of real GDP by 0.63467 units, all other things remain constant. It means that foreign aid has crucial impact on promoting Ethiopian economy in the long run.

The above long run equation also revealed that domestic saving has negative and statistically significant effect on economic growth. Similarly, foreign direct investment has also negative but insignificant impact on growth of real GDP. This suggests that one unit change in increment both saving and FDI as ratio of GDP causes the log of real GDP to decrease by 0.26195 and 0.02369 units respectively, while other things remain constant. From the result we can justify that foreign aid retard the domestic saving and put pressure on domestic saving, which negatively affect the economic growth. On the other hand, FDI growth became insignificant on real GDP because FDI creates clouding out effect on domestic investment rather than narrowing foreign exchange gap and substitute domestic investment as explained in the literature.

As to many literatures, the above long run growth equation also confirms that there is a positive relationship between

human capital and real economic output. The result shows that one percent investment increment in human capital causes economic performance to increase by 0.91893 percent. Thus, there is strong statistical support for education and health being important for economic growth and development, i.e investing in the human capital is having

high priority for economic growth, and determines sustainability of economic development of the country.

4.2.2. Vector Error Correction Model (Short Run Dynamic Model)

Short run dynamic model can be specified as:

$$\Delta LRGDP = \sum_{i=0}^{k} \Delta Laid + \sum_{i=0}^{k} \Delta LS + \sum_{i=0}^{k} \Delta LHC + \sum_{i=0}^{k} \Delta LFDI - ECM_{T\_1}$$

Where k represents lag length and ECM_{T_1} denotes error correcting term. Using the above equation, the dynamic equation for the growth equation is reported as below.

Table 13. Result for dynamic short run growth equation.

Variable	Dependent Variable DLRGDP			Diagnostic Tests
	Coefficient	t- value	t-probability	
constant	-.31623**	-2.94	0.006	DW (6,38) = 1.847
DLaid	1.8841**	2.05	0.049	AR (1-2) test= 0.112(0.7376)
DLS	-0.27985	-0.86	0.395	ARCH X^2 (1) = 0.05(0.8231)
DHC	0.07651**	2.89	0.007	NormalityX^2 (20)=19.38(0.497)
DLFDI	-0.01945	-2.06	0.048	Hettest: X^2 (1) = 2.20(0.138)
ECM_1	-0.03914**	-3.81	0.001	RESETTestF (3,29)=1.13(0.353)
R^2 =0.5829, R^{2adj} =0.5178, F(5,32) = 8.94(0.000)**, Note that: ** denotes rejection of null hypothesis at 5% level of significant.				

Generally, diagnostic test of short run model of above growth model in the table shows that there is no problem of regression analysis at all. The tests show that null hypothesis of various tests are not rejected, except Fc –test of which shows joint insignificancy of each independent variables, which means that the coefficients of all each explanatory variables are jointly significant i.e. each coefficients of explanatory variables are different from zero. Overall fit independent variables satisfactory R^2, about 58.29% of total variation is explained by error correction model. Other tests results explained that there are no serial correlations and errors are normally distributed with constant variance (homoscedasticity) are all satisfied. ARCH test failed to reject null hypothesis, which is no conditional autoregressive heterocedasticity problem appeared. Ramsey's tests for models misspecification also not reject the null hypothesis; it showed that there is no problem of model misspecification. The model variance inflation factor (VIF) also proofs that the short run dynamic models have no multicollinarity problem.

The coefficients of dynamic short run model show that log of domestic saving as ratio of GDP which insignificant negative impact on the dynamic short run economic growth. Similarly, log of FDI as the ratio of GDP also has the adverse impact on log of real GDP growth but it is statistically significant. The remaining variables, log of aid, and log HC

revealed the positive and statistically significant as theoretical expectation. The estimated dynamic model confirmed that foreign aid and human capita shows the crucial factors fostering economic performance in the short run model. It also implies that foreign aid used to finance resource gap in short run.

Highly significance of error correction term shows the evidence of stable long run evidence relationship among the variables and shows the maintenance of long run relationship from short run change and crucial for policy analysis. The above table shows that the ECT is significant and has negative expected sign. ECT (-1) model -0.03914, shows that deviation in the long run the economic growth is corrected by 3.914 in a year.

4.3. Investment Equation: Long Run Equilibrium and VECM

4.3.1. Long Run Investment Equation

Since presence of unit root tested variables entered in the investment equation are co integrated in similar order I(1), the next step is testing co integration. So, both λ_{trace} and λ_{max} statistics support the existence of one co integrating vector, which make up the long run relationship among the variables in the model (Table 14).

Table 14. Johansen's co integration test for Investment equation.

Ho (Null HYP)	H1 (Alt HYP)	Eigen value	λ_{trace}	5% crit.value	1% crit.value	λ_{max}	5% crit.value	1% crit.value
r≤0	r=0		100.187	94.15	103.18	39.2297	39.37	45.10
r≤1	r=1	0.6536	60.9571**5	68.52.	76.07	27.8778	33.46	38.77
r≤2	r=2	0.5293	33.0793	47.21	54.46	17.9003	27.07	32.24
r≤3	r=3	0.3837	15.1790	29.68	35.65	10.2615	20.97	25.52
r≤4	r=4	0.2422	4.9175	15.41	20.04	4.6197	14.07	18.63
r≤5	r=5	0.1174	0.2979	3.76	6.65	0.2979	3.76	6.65

Note: *** denote rejection of the null hypothesis at 1% and 5% significance level respectively. Also, the optimal lag length one is used to test co integration is determined at lag length three Akakie information criteria (AIC).

Due to the presence of only single co integrating vector associated (α) and (β) coefficients are necessary for further analysis for short run and long run. Associated coefficient (α) and (β) are shown in the following tables.

Table 15. *Normalized long run β coefficients for Investment equation.*

Variables	INV	SAV	AID	INFL	FDI	Debts
Estimated coefficients	1	6.808	-15.2021	-0.0782	-0.2119	-0.0088

Table 16. *Adjustment (α) coefficients.*

Variables	Adjustment coefficients
INV	-0.0517
SAV	-0.0232
AID	0.0206
INFL	0.5764
FDI	0.4710
Debts	0.5304

The table 16 shows the speed of adjustments towards the long run steady state of the long run variables. For instance, coefficients of -0.0517, and -0232, shows the speed of adjustment of investment per GDP, saving per GDP, toward long run steady state respectively. In other words, the adjustments of investment, saving, adjust to their own long run by 5.17 and 2.32 percent respectively. But, the coefficient of α of foreign aid, inflation, foreign direct investment and debt service to export ratio is positive, which shows that the extent in which these variables deviate from its long run steady state path after specific shock.

After the existence of long run integration test is performed, the next procedure is testing significance of (α) coefficients. This test shows whether speed of adjustment (α) coefficients significantly different from zero or not is tested for the variables.

Table 17. *The result of tests for significance (α) coefficients for Investment equation.*

variable	INV	SAV	AID	INFL	FDI	Debts
α	-0.0517	-0.0232	0.0206	0.5764	0.4710	0.5304
z	-3.46	-1.68	3.36	0.13	0.82	0.14
P-value	(0.001) **	(0.092)	(0.001) **	(0.896)	(0.411)	(0.889)

Note: ** represents rejection of coefficients at 5% level of significant.

For this reason, the long run relationship among variables can be formulated and analyzed by taking investment as dependent and taking other variables, saving, inflation, foreign direct investment and debts as independent variables. In the same manner, test of long run β coefficients is vital to identify which variable in investment equation is statistically different from zero.

Table 18. *The result of tests for (β) coefficients for Investment equation.*

variable	SAV	AID	INFL	FDI	Debts
β	6.808	-15.2021	-0.0782	-0.2119	-0.0088
Z	2.16	-1.91	-5.29	-1.97	-0.78
P-value	(0.031) **	(0.057)	(0.000) **	(0.049) **	(0.438)

Note: ** represents rejection coefficients at 5% level of significant.

Likelihood ratio test of table 18 above shows that, except saving as percentage of real gross domestic product and inflation, the null hypothesis β =0, for both foreign aid as percentage of GDP and debt service as ratio of export rejected and statistically significant at 1% percent level, which can explain the long run investment equation in Ethiopia.

The estimated long run investment equation with respective sign and significant is presented as:

$$\text{Invest} = -6.808\text{SAV} + 15.2021\text{AID} + 0.0782\text{INFL} + 0.2119\text{FDI} + 0.0088\text{Debts}$$

$$\text{SE:} \quad (3.15) \quad (7.98) \quad (0.015) \quad (0.107) \quad (0.011)$$
$$\text{P} - \text{Value:} \quad (0.001)^{**} \quad (0.057) \quad (0.000)^{**} \quad (0.049)^{**} \quad (0.438)$$

$$\text{Vector AR 1-2 chi2 (1)} = 4.006(0.0638),$$

$$\text{Vector Normality: Chi2 (19)} = 25.37(0.7571)$$

To check the consistency of the model, performed diagnostic test revealed that the long run equation is adequate and reasonably accepted. That means the null of no serial correlation and homoscedasticity are not rejected at any significant level, also the null hypothesis of normality which errors are normally distribute is also not rejected at 5% level of significant.

The above long run investment equation confirms that when domestic saving entered into the equation; it has statistically significant and negative effect on domestic capital formation. The result did not in line with the theoretical expectation, which domestic saving does promote

investment in the country. Inflow of foreign aid retarded and put pressure on domestic saving which make the negative and inverse relationship between saving and investment. Theoretically, it is believed that saving is used as the source of the fund for investment, any factors that used for rising saving also used to stimulate rise in investment. But, in this finding it can be argued that domestic saving is not allocated for productive investment activities due to poor economic development saving is constrained from rising investment, thus affect negatively investment.

The result revealed that debt service is statistically insignificant but, positive effect on gross domestic investment. It might suggest that even though the resource gap is closed by debt creating flow of foreign aid, debt service has no negative impact on gross capital formation in Ethiopia. One percent increase in foreign debt, it would be leads to increase the domestic capital formation by 0.88%, when other things hold constant. It can be justified that debt flow from abroad to promote investment, after certain period of time it can be repaid back, it has no adverse effect on domestic capital formation in long run capital because capital gained from debt can be paid back from effectively investment growth. The finding strengthen that the debt service is not the threat of economic performance in Ethiopia. This is because of debt service has high relation with other macroeconomic variables like foreign exchange, government budget, inflation and others.

The result of inflation as measure of macroeconomic disturbance in above long run equation, shown the positive and insignificant impact on domestic capital formation, which is argumentative to theoretical expect in the literature, the result obtained show that inflation in Ethiopia has no adverse effect on growth gross capital formation. It can be argued that the country has good monetary policy; so, inflation is controlled from deterring investment. For instance, from this result, one percent increases in annual inflation leads to raise in gross domestic investment more and more by 7.82 percents.

From above long run investment equation also reveals that foreign direct investment has positive and statistically significant at 5% level. The result implied that one percent increase in FDI causes increase in domestic gross capital formation by 21.19 percent. From the result we can say that FDI in Ethiopia used to augment domestic capital. Foreign direct investors are used to boost domestic capital formation because they would transfer technology; supplement input for domestic investment by constructing infrastructures for domestic investment. Therefore, FDI is used for crowding in domestic investment rather than crowding out effect.

4.3.2. Vector Error Correction Model for Investment Equation

Short run dynamic model can be specified as:

$$\Delta I = \sum_{i=0}^{k} \Delta aid + \sum_{i=0}^{k} \Delta saving + \sum_{i=0}^{k} \Delta infl + \sum_{i=0}^{k} \Delta FDI + \sum_{i=0}^{k} \Delta debt - ECM_{T\_1}$$

Where k represents lag length and ECM_{T_1} denotes error correcting term. Using the above specification, the dynamic investment equation can be reported as below.

Table 19. Result for dynamic short run investment equation.

Variable	Dependent Variable D (investment)			Diagnostic Tests
	coefficient	t-value	t-probability	
constant	0.0159	0.89	0.381	DW (7,37) =2.526
DSAV_1	0.7888***	6.43	0.000	AR (1,2)= 2.979(0.084)
DAID_1	0.3145	1.02	0.314	ARCHX^2(1,2) test=0.687(0.4071)
DFDI_1	0.0019	0.59	0.559	Normality X^2 (27)=32.95(0.199)
Ddebts-1	0.00006	0.10	0.920	Hettest: X^2(1) test = 0.05(0.8173)
ECM_1	-0.05469	0.89	0.038	RESETTest F (3,27)=0.44(0.7245)
R^2 =0.6012 F(6,30) = 7.54(0.0001) **				

The various goodness of fit for the above equation shows there is no problem regarding the regression analysis. It can be explained as there is no problem of test for serial autocorrelation, the heterocedasticity of errors and ARCH, which show absence of autoregressive conditional heterocedasticity errors all didn't rejected the null hypothesis. Moreover, the general test for misspecification provided by Ramsey's, RESET test also doesn't reject the null hypothesis and there is no functional problem in estimated equation. At the end, the Jarque Bera test for normality indicates that the null hypothesis of normality distributed by error term doesn't reject. R^2 of the models explain 60.12 percent total variation in dependent (which is log of investment ratio of GDP) is explained by all independent variables.

F Statistics, F (6, 30) = 7.54(0.0001) ** reject the null

hypothesis, shows that the coefficients of all explanatory variables different from zero. Overall there is no problem of diagnostic tests appear, so, the fitted regression analysis model is acceptable and reasonable. The short run dynamic investment also satisfies stability conditions, i.e. all Eigen values lies in the unit circle.

The finding dynamic short run model showed that investment is positively related with domestic saving and it statistically significant and has a crucial role to promote investment in short run. Foreign aid at lag two showed positive and statistically insignificant. The result like the theoretical expectation revealed that foreign aid is used to bridge saving and investment gap in short run. Dynamic short run investment equation also, shows that the current and past net of debt service of Ethiopia has positive and insignificant

impact on short run gross capital formation (investment).

The above dynamic short run gross domestic investment equation reveals that debt service of Ethiopia is insignificant and has a positive sign. This indicates that foreign external debt encourage the gross domestic investment, evidence also slightly shows that foreign debt does not make crowding out effect debt service payment in short run.

The error correction term (ECT_1) of one lagged level the dynamic short run equation which captures the long run dynamic is negative and significant at 5%, it indicates the speed of adjustment in which actual investment in past year

to equilibrium of investment growth rate. It means that gross domestic investment adjusts itself by 5.469 percent to equilibrium in one year.

4.4. Granger Causality Test Between Foreign Aid, Growth and Investment

The main aim of this section is whether foreign aid causality causes investment and economic growth or not. The different questions about causation rose whether aid causes growth or aid causes investment, saving or not.

Table 20. Result of VAR Granger Causality test.

Null hypothesis	Chi2(1)	Probability	Decision
GDP does not Granger causes FAID	0.02008	0.887	Cannot Reject Ho
FAID doesn't granger causes GDP	6.5245	0.011	*Reject Ho*
Investment does not Granger causes FAID	0.2315	0.630	Cannot Reject Ho
FAID does not Granger causes Investment	9.206	0.002	*Reject Ho*

From the table of VAR granger causality test support for hypothesis of foreign aid causes both growth of GDP and investment because all of them reject the null hypothesis.

There is evidence for direction of causality of growth investment and saving at 5% level of significant. For instance, Foreign aid causes growth, investment unidirectional, not bidirectional, none the variables growth, and investment causes foreign aid (Table 20). Therefore, the result implies that VAR granger causality affirmed that foreign aid bridge saving and investment gap leads to economic growth in long run.

4.5. Findings of the Study

1. The growth equation shows that foreign aid has statistically significant positive effect on economic growth both in long run, and short run. From the result we can say that aid is vital to boost Ethiopian economy.
2. Human capital has a positive effect and it is statistically significant and fundamental in both long and short run. It is also the core for permanent policy variables to bring sustainable development in the country.
3. The findings also reveal that domestic saving has a significant negative influence on economic growth in the long run, this is because it will cause low diversification of saving that would be utilized to finance various development endeavors and foreign aid affect domestic saving and cause a crowding out effect, aid is used for consumption rather than saving. The result is consistent with finding like Griffin [25] sub Saharan Africa.
4. According to the findings, foreign direct investment creates insignificant negative effect in the long run, while it has a negative and statistically significant effect in the country's economic growth in short run.
5. The result also revealed that the relationship between foreign aid and gross domestic investment is positive and it has statistically insignificant effect on investment in both the long run and short run. There is insignificant

relationship between investment and foreign aid because most of the time foreign aid is used for consumption purpose in the form of grants and loans rather than significantly promoting domestic investment.
6. Foreign direct investment showed both positive and statistically significantly effect on investment in the long run, and insignificant positive effect in the short run on gross capital investment growth; this is because of the fact that foreign direct investment complement domestic investment.
7. The above result confirmed that domestic saving has statistically significant and negative effect on domestic capital formation in the long run and positive statistically significant effect in short run. In addition, the findings show that foreign debt has no adverse impact on gross domestic investment, which means that the amount of debt taken by the country creates no problem on investment and it is good for financing investment in the country.
8. Inflation has no adverse effect on Ethiopia's investment sector in both long run and short run. This is because of the fact that inflation increment amount in Ethiopia is very small or single digit which has no effect on investment.
9. The causality relationship between pair of GDP and foreign aid as well as investment and foreign aid shows that foreign aid is used to promote economic and investment grow.

5. Conclusion and Recommendation

5.1. Conclusions

The study tried to find out whether short run and long run relationship between foreign aid, economic growth and investment is permanent or temporary by using annual data covering from 1974 to 2014. To conduct the analysis both growth and investment equation was estimated. The VECM

methodology is performed in order to analyze both the long run and short run relationship for both equations. While to find out whether foreign aid causes growth, investment and saving, method of VAR Granger Causality test is used.

The estimated result indicated that overall impact of foreign aid on economic growth and gross domestic investment is positive. The findings conclusion is explained as follows: -

The estimated empirical results from the growth equation demonstrated that foreign aid has statistically significant positive effect on economic growth both in long run and short run. From the result we can argue that receiving more aid has no adverse effect rather it has a significant contribution to boost Ethiopian economy. The research showed that human capital has a positive and statistically significant long and short run result. This implies that human capital is crucial for permanent policy variables to bring sustainable economic growth of Ethiopia. The findings also showed that domestic saving has a negative influence on economic growth in the long run; this is because of low level of saving impact of foreign aid on domestic saving.

The study also revealed that the relationship between foreign aid and gross domestic investment is positive and has statistically insignificant effect on investment in both the long and short run. This result suggests that foreign aid has no negative impact in investment but, most of the time foreign aid is received and used for the purpose of temporary consumption that means mostly during war and drought. It also implies that foreign aid has its own role in achieving the capital stock. Foreign direct investment showed both positive and statistically significant effect on investment in the long run, and insignificant positive effect to influence the gross capital investment growth in short run, which refers FDI is influential to supplement output for domestic investment also making crowding in effect. Inflation showed no adversely significant effect on gross domestic investment in both long and short run. The causality test among the pair GDP and foreign aid, and investment and foreign aid also revealed that foreign aid enhance economic growth and investment, if there is a favorable environment and good policy for growth and investment, which is in agreement with many of the literature.

5.2. Recommendations

The empirical results from these findings have some important policy recommendation.

1. The government of Ethiopia could have formulated better sound policy which is comfortable and attractive for donor.
2. Foreign aid should be focused on growth enhancing sectors as well as poverty reduction policies, and then it will raise savings of societies'.
3. It is better to have saving policy to promote, replace high amount of foreign aid inflow, to rise domestic revenue and achieve the development destiny on their own hand of society and should have cease gradually dependency on foreign aid.

4. The government also should take appropriate policy measures and reforms that would monitor the amount of foreign aid and prioritize them with a view to bringing about effective utilization of foreign aid. The policies and reforms will boost economic growth thereby promoting investment in Ethiopia.
5. Also, minimizing the level of illiteracy, improving low educational quality, advance in research and development, replacing the dominance of agricultural sectors which constitute the majority of labor force whom are illiterate by industrialization and urbanization should get priority.
6. The government should attach a serious attention to control the profit gained from foreign investors by conducting further analysis because they are profit maximizes and can affect the country's economy unless they are handled with sound policies. The government should also give priority to support and motivate domestic investors.
7. Further study is also needed to find out the effect of foreign aid policy linkage with Ethiopia's macro economy and which type of aid is best for economic growth and development of Ethiopia.

Operational Difinition of Terms

Gross Capital formation consists of outlay on addition to fixed assets of the economy plus net changes in level of inventories.

Gross domestic product is the total value of all goods and service produced over a period of time (usually one year), excluding net factor income from abroad.

Investment is spending on capital goods by firm and government, which will allow production of consumer goods and services in future time periods.

Abrivations and Acronyms

ADB	Asia Development Bank
EU	European Commission
EC	Error Correction Model
GDP	Gross Domestic Product
GNP	Gross National Product
IDA	International Development assistance
IADB	Inter-American Development Bank
VAR	Vector Autoregressive

Acknowledgements

an expert of at the National Planning Commission of Ethiopia for their constructive contribution to my study.

Lastly, thank all friends who have their hands in the completion of this study.

References

[1] Alemayehu G. (2001). Macroeconomic Performance in post-Derge Ethiopia, *North East African Studies, Vol. 8, No. 1. pp. 159-204.*

[2] Burnside c. and D. Dollar (2000), Aid, Policies and growth, Policy Research Working Papers 1777, The World Bank, Development Research Group, Washington. DC.

[3] Dowling, J. and Hiemenz, V. (1982) "Aid, Saving and Growth in Asian Region", quoted in White. (1992a) "The Macro economic Impact of Foreign Aid: A critical survey", Journal of Development studies", vol. 28 (2), pp. 166-224.

[4] Fentaye S. (2015), The Impact of Foreign aid on Economic growth of Ethiopia (Through Transmission Channels), Adigrat University, Adigrat, Ethiopia.

[5] Girma H. (2015), The impact of Foreign aid on Economic growth: Empirical Evidence from Ethiopia, Using ARDL approach, Aksum University, Aksum, Ethiopia.

[6] Griffin K. and Enos J. (1970), Foreign Assistance: Objectives and Consequences, Economic Development and Cultural Change vol. 18, pp. 313 -320.

[7] Levy V. (1988), Aid and Growth in Sub-Saharan Africa; The Recent Experience, Europe Economic Review, Vol. 32, Pp. 77 - 78.

[8] Mehdi S. and Masoud. A (2011), Investigating The effect of Foreign Aid and Investment on Economic Growth in Iran, *Journal of International Review of Business Research Papers Vol. 7. No. 4, PP. 150 -158.*

[9] MoFEC, (2015) Ministry of Finance and economic development of Ethiopia.

[10] Papanek G. (1972), The Effect of aid and other resource transfers on savings and Growth in less Developed countries, *Economic Journal.*

[11] Papanek G. (1973), Aid, Private Foreign Investment, Savings and Growth in less Developed countries, *Journal of Political Economy, Vol. 81, pp. 120-130.*

[12] Tasew T. (2011), Foreign Aid and Economic Growth in Ethiopi, M.Sc. thesis. Adama University.

[13] Tesfahun B. (2014), Foreign Aid and economic growth in Ethiopia unpublished M.Sc. thesis, AAU.

[14] Wondwesen W. (2011), Impact of Foreign capital inflows on economic growth of Ethiopia, working Paper.

[15] World Bank 1998. *Assessing Aid: What Works, What Doesn't and Why.* Oxford UP, Oxford, UK.

[16] Newlyn (1973). The effect of Aid and Other Resource Transfer on Savings and Growth in Less Developed countries, Economic Journal, Royal Economic Society, vol. 83 (331), pages 867-869.

[17] Rajan & Subramanian (2005), Aid and Growth: What does the cross country Evidence really show? The Review of Economics and Statistics, MIT Press, vol. 90 (4), pages 643-665, 06.

[18] Doucouliagos, C., & Paldam, M. (1997). Conditional aid effectiveness. A Meta Study. Mimeo Economics Department, University of Aarhus, Denmark.

[19] Gong and Heng-fu (2001) Foreign Aid Reduces Labor Supply and Capital Accumulation. Review of Development Economics, Vol. 5, Issue 1, pp. 105-118.

[20] Weisskopf (1970), The impact of foreign capital inflow on domestic savings in underdeveloped countries, Volume 2, Issue 1, February 1972, Pages 25-38.

[21] Paldam (1997). Political Business Cycles, Perspectives on public choice: A handbook, a) 342-370.

[22] Battarai (2005). The Effects of Exchange Rate on the Trade Balance in Ghana: Evidence from Cointegration Analysis. Hull, Centre for Economic Policy, University of Hull.

[23] ECA (2006). Economic Commission for Africa (2007-02). Report on ECA's statistical activities in 2006-2007 and proposed work programme 2008-2009. UN. ECA Committee on Development Information Meeting (5th: 2007, Apr. 29 - May 04: Addis Ababa, Ethiopia). Addis Ababa.

[24] Alemayehu (2005). Explaining African Growth Performance: The Case of Ethiopia, Addis Ababa University.

[25] Griffin (1972). Financing Development in Latin America. Aid as Imperialism (Harmondsworth, Penguin Books). Pp. 222.