THE ROLE OF FOREIGN AID FOR ECONOMIC DEVELOPMENT OF ETHIOPIA

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This to certify that the thesis prepared by Yoseph Hiruy Enigda, entitled: “The role of foreign Aid for economic development of Ethiopia” and partial fulfillment of the degree of master of science in development economics complies with the regulations of the university and meets the accepted standards with respect to originality quality.

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ACRONYMS

ADF----------Augmented Dickey-Fuller

AIC----------Akaike Information Criteria

APF----------Aggregate Production Function

CSA----------Central Statistical Authority

DAC----------Development Assistance Committee

OECD----------Organization for Economic Co-operation and Development

DF----------Dickey-Fuller

ECA----------Ethiopian Economic Association

ECM----------Error Correction Model

EPRDF----------Ethiopian People's Revolutionary Democratic Front

GDP----------Gross Domestic Product

GDS----------Gross Domestic Saving

GTP----------Growth and Transformation Plan

HIPC ----------Heavily Indebted Poor Countries

HQ----------Hannan-Quinn statistics

IMF----------International Monitory Found

LDCs----------Least Developed Countries

MDG----------Millennium Development Goals

MOFED---------- Ministry of Finance and Economic Development

NBE----------National Bank of Ethiopia

NGOs----------None Government Organizations

NPV ---------- Net Present Value

ODA----------Official Development Assistance

OECD----------Organization for Economic Cooperation and Development

OLS----------Ordinary Least Squares

PP----------Phillips Perron

SBC----------Schwartz-Bayesian criteria

RGDP----------Real Gross Domestic Product

TFP----------Total Factor Productivity

VAR----------Vector Auto-regression

VECM----------Vector Error Correction Model

UN----------United Nation

UNDP----------United Nations Development Programme

USD----------United State Dollar

WB----------World Bank

ABSTRACT

The research has tried to investigate imperially, the contribution of official development assistance in filling the resource gaps of Ethiopia. For this purpose, quantitative data has been gathered, organized and analyzed from the year 1990 to 2019 G.C. Co-integration test and Error Correction Model was applied in order to investigate the long run and short-run relationship between dependent and the independent variables. Accordingly, the research investigate the reality of Ethiopia having: the saving investment gap for the year 2005 – 2020 at average was 14.56 % percentage of GDP, the trade gap for the year 2005 – 2020 in average was 17.06 % percentage of GDP and average fiscal gap (budget deficit) from year 1993 to 2018 including the grant received was 12.10 Billion Birr. The empirical results from econometrics model reveal that foreign aid has positive impact on economic growth in both long run and short run and statistically significant at 1 percent significant level. The positive and significant error correction term shows that the extent to which ODA deviate from the long run steady state path after a certain shock, which, is 0.329 percent each year. The important policy implication of the study proposes that more effort has to be made to improve the negative impact of interest payment on external debt, mainly because of existence of poor institutional arrangement, which accumulate unpaid sums that shall create burden to the future repayment schedule and doubt on potential donors. the fund to unproductive sectors. The government has to ensure, a close monitoring and consistent management strategies, which is used to avoid mismanagement problems specially, for timely repayment strategy. Finally, the research paper tried to realize that the absorption capacity using assessment on rate of increase in saving and investment through the last thirty years, and the mere existence of the resource gap in every years and time-to-time increase of the management capacity of institutions.

Keywords: Economic Growth; Foreign Aid; interest payment on external debt; absorption capacity; Ethiopia.

CHAPTER ONE

1. Introduction

1.1 Back ground of the Study

Ethiopia began to receive economic development aid from the more affluent Western countries after World War II. Originally, the United Kingdom was the primary source of foreign aid, but they withdrew in 1952, replaced by the United States. Between 1950 and 1970, one source estimated that Ethiopia received almost US$600 million in aid, $211.9 million from the US, $100 million from the Soviet Union and $121 million from the World Bank. Sweden trained the Imperial Bodyguard and India at one point contributed the majority of foreign-born schoolteachers in the Ethiopian educational system *(Keller.1991)*.

Ethiopia has been one of the major recipients of international aid in recent times. According to OECD-DAC statistics, net ODA to Ethiopia amounted to US$1.94 billion in 2006, making it the 7th largest recipient among 169 aid receiving developing countries. In absolute terms, the amount of ODA has risen sharply from an average of $881 million per annum in the second half of the 1990s to over $1574 million per annum for the first half of the 2000s. Over the last seven years (2000-2006), ODA has averaged at $1683 million per year. The average contribution of bilateral donors to ODA over the eight year period was $322.4 million per year accounting for 31 percent of ODA. In the 1990s, some 49 percent of the total net ODA was in the form of multilateral aid. This was slightly reduced to 46 percent for 2000-2006, reflecting the increased importance of non-multilateral sources (Getnet, 2009).

Previous domestic policy of Ethiopia, aid volatility, the capacity of the government, the system of aid allocation and conditionality that imposed by donors are the main the factors that makes foreign aid unsuccessful history of Ethiopia. Even though, there is historical development of foreign aids referring backs to 1950's, limited natural resource base, the existing institution, culture and harsh physical environment are also explains the relative effectiveness and ineffectiveness of foreign aid in the country.

Recognizing the role of foreign aid in the recent year since the introduction of Market economy there have been some improvements and successes particularly in improving social indicators, otherwise aid to Ethiopia has least success story compared to other African countries. Currently, development

partners are leveraging potential official development assistance (ODA) to mobilize other resources for sustainable development; to improve country's trade performance & integration into the world economy and to mobilize domestic resources of the country to engage private sectors in the development process of the country. However, more must be done to meet the finance demand of the country to achieve middle-income status by 2025 (MOFED, 2019).

The other most important permanent feature of the Ethiopian economy is the presence of resource (financial) gap. The resource gap explained as the presence of savings investment gap, foreign exchange gap and fiscal gap. In recent years, the savings-investment gap has been widening from an average of 1.1% of GDP during the Imperial period (1960-74) to 6% of the GDP during the Derg period (1974-91) to 11.7% of the GDP in the EPRDF (1991/92- 2007/08). Ethiopia's resource gap (the difference between domestic saving and domestic investment) was17.8% of GDP in 2013/14 (National Bank of Ethiopia); recent IMF estimates suggest a still higher gap in the 18% range in 2014/15 (IMF, 2014). The presence of resource gap (gross domestic investment-gross domestic savings) forces the country to rely on an inflow of foreign finance (foreign aid) to bridge the gap *(Tadesse, 2011).*

Following the implementation of the HIPC initiative, which culminated in successfully reaching completion point in 2006, the country benefited from significant debt burden reduction. Since then it is evident that a significant buildup of debt has materialized, reaching the current level of 49.8% in NPV terms) of GDP in 2018. By end of June 2018, Ethiopia's total public external and domestic debt stock including publicly guaranteed debt amounted to USD 49,361.60 million compared to USD 45,797.01 million reported at the end of June 2017 representing an increase of 7.8%. Domestic debt increased by 4.8% to USD 23,453.00 million while external debt increased by 10.6% to USD 25,908.60 million at end June 2018 from June 2017 (MOFAD, 2018).

Foreign capital inflows are receiving due attention because of their potential to finance investment and perceived to promote economic growth in the recipient country. The growing divergence in saving and investment rates, export-import gap (foreign exchange constraints to import capital goods) and budget deficits in developing countries make them to depend highly on inflow of foreign capital. As Gomannee, Girma and Morrissey (2005) has suitably stated, "Poor countries lack sufficient domestic resources to finance investment and the foreign exchange to import capital goods and technology. Aid to finance investment can directly fill the savings-investment gap and, as it is in the form of hard currency, aid can indirectly fill the foreign exchange gap. As official aid is issued to government, it can also fund government spending and compensate for a small domestic tax base". The scenario in

Ethiopia is not different from the other poor countries. The capability of Ethiopia in improving the level of investment and promotion of economic growth through domestic capital sources and private capital inflow alone is far from adequate. This makes the importance of foreign aid indisputable to the performance of the economy. (The Economic Research Guardian, 2011).

1.2 Statement of the Problem

The ultimate objective of any less developed country is to ensure sustainable socio-economic development. This sustainable development effort requires a huge amount of resources even more than what the existing economy can generate. Gebreyesus et al (2018) pointed out that, Ethiopian economy is characterized by low level of technology and productivity, high rates of population growth, low level of saving, import of capital goods while export of agricultural products which results in foreign exchange constraints, high current account payment deficit and large external debt. Hence, the Primary objective of the government policy would be to overcome these deep rooted problems and attain sustainable economic development all over the country.

According to Ababa (2002) formation of capital is the core for increasing production and productivity of the nation and the rate of capital formation is determined by the saving rate and the saving rate is in turn depends on the national income of the country. Hence, if the national income is too low, the saving rate will also be too low which will not help to increase capital accumulation rates, because the marginal propensity to save (MPS) is too low; in that case the marginal increase in income is used for subsistence consumption only rather than for saving.

According to Chenery and Strout (1966, 1979), in order to meet the capital requirement for investment and improve economic and social welfare, most developing countries including Ethiopia is seeking for external assistance in the form of official development assistance. Ethiopia is not an exception to this view; as a result it is one of the recipients of foreign aid not only to provide emergency relief but also to support long term economic development. However there is high debate on foreign aid and that its impact on the growth of the country.

Several studies have conducted on the impact of economic benefit of foreign aid on boosting economic performance of Ethiopia. Among them, few of them are:

Tolessa (2001), studies the relationship between foreign aid (in disaggregated form: loan and grant), domestic savings, investment and economic growth for the period 1964/65 to 1998/99 using

Johansen's maximum likelihood estimation procedure. His finding result come in the conclusion that in addition to domestic saving, external loan has boost domestic capital formation. However, his finding has concluded the insignificance of the grant element of foreign aid on domestic capital formation.

Mesfin (2007), pointed out that increases in foreign aid result in higher government expenditure, and has significant positive long-term impact on economic growth. However, his investigation did not distinguished the domestic and foreign aid financed government expenditure. As a result, correlation has existed between government expenditure and foreign aid in the determination of the growth model, this result with wrong conclusion due to the problem of double counting. Despite the mentioned problems, the study indicate that, there exists a long run role of foreign aid effectiveness in Ethiopia.

Tasew (2011), stated that foreign aid has positive impact on economic growth in long run and insignificant in short run. He identified that when aid is combined with good policy has positive effect on growth and when aid combined with bad policy, it has deleterious impact on growth in the long run. He also indicate in his model using variable Aid squared, unlike the theoretical view, has a positive sign, pointing the absence of capacity constraint in the flow of aid to Ethiopia. Indeed, he request for a deeper investigation and further research on the absorptive capacity of the country regarding aid flow.

The above-mentioned studies and related works in the area understudied had significantly contributed to understanding the role of economic benefit of foreign aid in improving the economic performance of the country. The studies mostly relate foreign aid with government expenditure and aid impact on the short run and long run economic growth. Mostly, they showed long run economic benefit of aid on economic development because of increasing government expenditure.

Despite massive inflow of aid in to the country and extensive empirical work for decades on the aid-growth link, the aid effectiveness research remains controversial. They did not indicate the impact of foreign aid on real GDP of the country and they did not indicate share of foreign aid in returnable projects and industrial sector. The study under estimated the short run benefit of foreign aid. In addition, mostly they did not indicate loan repayment links to real GDP of Ethiopia. Finally, the country's experience shows that it is not only the quantity or volume of foreign aid but the qualities of government & the existence of strategic policy of the country, which enables to attain its objectives.

Thus, this study tries to explain and fill the gap whether foreign aid has a significant on economic development of Ethiopia using recent year data from 1990 to 2019 GC. In addition, the study tried to explain the significant of interest payment on external debt, and the extent of resource gaps and

absorptive capacity of Ethiopia for foreign resource. Finally, unlike the previous studies, this study uses: Data of general government final consumption expenditure, to avoid aid funded government investment and, domestic saving instead of domestic investment, to block the foreign resource mainly foreign direct investment and investment through aid, which is not the interest of this paper.

1.3 Objectives of the Study

The general objective of the study explores the contribution of official development assistance (ODA) in addressing development issues (economic growth) and determine the significance of ODA in stabilizing the macroeconomic environment of Ethiopia.

Specifically the study

a) Empirically examine the long run and short run impacts of foreign aid on economic growth.
b) Describe the trends of ODA flows to Ethiopia, and interest payment on external debt and its effect on real GDP of Ethiopia.
c) Investigate whether there is short run and long run causality between ODA and economic growth of Ethiopia. In addition, assess the absorption capacity of the economy for external resource.
d) Draw concluding remarks and appropriate policy implementations for sustainability.

1.4 Research Question

Research finding based on growth theories suggested that, an increase in capital flows would lead to a higher economic growth by filling the resource gaps. Therefore, the researcher has conducted based on the prevailing current condition of Ethiopia. Apparently the question may not be exhaustive. But the researcher believed them to be representative.

The research tries to explain the extent of official development assistance (ODA) flow to the country and the contribution it has in the total real GDP. Accordingly the study attempts to answer the following questions and investigate the relevant statements stated below

- Does, official development assistance (ODA) received so fare positively affect the real GDP of Ethiopia?

- Is there a long run and short run relationship between ODA and economic growth?
- Does, the country has absorption capacity for external resource?
- Is there a causal relationship between foreign aid economic growths in Ethiopia?

1.5 Scope of the Study

Obviously the scope of the study was quite wide as a result it was not be feasible to go deep into each and every aspects of foreign aid due to shortage of time. To achieve the objective, the study used time series data from the period 1990 to 2019 G.C for Ethiopia based on availability of data required for the study. However, efforts have been exerted to review available literatures on the study topics by giving due attention to the most important aspects of foreign aid contribution on economic development of the country, that is official development assistance(ODA). To this effect, senior essays, official reports, internet searches, journals and other sources were carefully investigated and reviewed in order to get good deal of acquittance. Therefore, the scope of the study was only be limited to different types of aid that were officially provided to the country and their subsequent impact on economic growth.

1.6 Significance of the Study

The basic purpose of this paper was to provide information about the role of official development assistance(ODA) in economic Development of Ethiopia. In the country, studies conducted so far on the role of foreign aid in economic development are limited in number; in which further studies are required. Therefore, this study will help in filling knowledge gap in the area of aid verses development. The study give information on the significance of ODA on real GDP. In addition, it put an evidence the amount of interest payment on external loan and its asymmetric power to real GDP of Ethiopia. Furthermore, the results of study could help the concerned policy makers with the appropriate recommendation.

Finally, the paper will also provide information for those who want to conduct a further research paper on foreign aid.

1.7 Limitation of the Study

The study doesn't have any financial sponsor. Additionally, the schedule of the research limited the exploration all aspect foreign aid. Therefore, the paper confined in investigating and analyzing the financial aspects of official development assistance (ODA). Despite of such constraints, an attempt has made to explore the necessary reading materials and good communication has been made with concerned ministry offices in order to furnish the study with reliable and timely information.

1.8 Organization of the study

The organization of the study has presented in the short and precise form as follows: The first chapter introduces the study, back ground of the study, statement of the problem, objective, research hypothesis, significance, scope and limitation of the study are described, research method used and outlines of the organization of the chapters is presented.

The second chapter describe the concept and theoretical approach of foreign aid, which focuses on, definitions of aid, different authors view, on the natures of aid, role of aid for economic development and its shortcoming are stated, trend statistics of foreign aid and its corresponding variables, processes and procedures and general overview foreign aid in Ethiopian context. In this chapter some empirical evidences have been indicated to asses about nature of aid in Ethiopia and the basic challenges of aid flow in Ethiopia

Chapter three explain the methodology used during conducting of the research and model specification of the study briefly. The fourth chapter is also deal about the actual data findings, analysis & interpretations. In this case all the collected data has been compiled, tabulated, interpreted and analyzed in detail. The research final and fifth chapter presents conclusion and recommendation of the result. It also gives recommendations for policy makers based on the findings of the study.

CHAPTER TWO

Literature Review

2.1 Introduction

The concept of development economics now a day has given special attention all over the country around our planet. United Nation, Regional Integrated Nations, individual donor countries, NGOs and others through different aid programs in addresses different strategies.

Accordingly, the allocation of the national budget of least developed countries (LCDs) has now given strong interest for foreign aid. Studies on the effect of foreign aid have focused mainly, on the impact of external assistance on domestic savings, domestic investment, government budget, the real exchange rate, the rate of economic growth, and more recently poverty and the incentive for reforming the recipient country. Therefore, foreign source could play a vital role in promoting economic development where there is government budget deficit, saving and exchange rate gap (Taylor, 1993)

Rosenstein-Rodan (1961) stated that the general purpose of an international aid program for under developed country is to accelerate the economic development up to a point where satisfactory rate of growth level on self-sustained basis. I.e. to provide in each LDCs positive incentive for maximum national effort and increase its rates of growth by increasing income, government expenditure, domestic saving and investment in which, foreign aid indirectly and directly make possible within shorter time to achieve self-sustaining growth. Therefore, the overall aim of development aid is not to equalize incomes in different countries but to provide every country with an opportunity to achieve a steady growth.

2.2 Conceptual Framework and Hypothesis

To understand the economic growth process and factors and policies which contribute to it and mechanism through which foreign aid (ODA) can affect the growth process, different theories evolved over the period of time.

Using Leontief production technology Roy Harrod (1939) and Evsey Domar (1946) developed the most popular and simplest theory in this regard (Shahzeb Shaikh, 2011):

$$G= (s/v -\delta)$$

Where G is the GDP growth rate, s is the fraction of the GDP which is saved, is capital to output ratio and δ is rate of depreciation for capital stock. This equality states that growth is determined by the saving rate (s) and capital to output ratio (v). The higher the saving rate and lower the capital to output ratio, the faster will an economy grow (Shahzeb Shaikh, 2011).

Moreover, one to one relationship between foreign aid and investment was assumed. Put in other words, foreign aid was considered as addition to domestic saving and not as component of Gross National Income (GNI), which will add aid both to consumption and investment. Therefore, the fungibilty of foreign aid was not assumed. (Shahzeb Shaikh, 2011)

Rosesentein- Radan (1943)

The theory of the big push "Launching a country in to a self-sustaining growth is little like getting an airplane after the ground, there is a critical ground be which must be passed before the craft can become airborne". This means if we increase investment let say enough that a country will begin to launch itself on the path of development that once we push, once that country reach a ground speed which that a critical speed however it takeoff its own, it begin to fly so. The question is when we gave foreign aid, did the country began to fly? The answer has different perspective and directions! We should see many factors like corruption, existence of development institutions etc.

Among different debates, the research answer the questions, **yes!** That is, when foreign aid is combined and interacted with good policy it works.

Chenery and Strout (1966, 1979) two-gap model

Practical studies of the aid-growth relationship carried out until the mid-nineties were inclined toward the early growth theories, which emphasized that the growth process depends on the ability to exceed the constraints regarding the accumulation of physical capital. Investment was taken as the only key element to economic growth.

Conventionally, the absence of savings critical to investment was regarded as the most important constraint to the economic growth of LDCs. Definitely, the main characteristic of developing countries are their inadequate capacity to make savings, due to their low per capita income. "The original Harrod-Domar model was expanded in the sixties in the Chenery and Strout (1966, 1979) two-gap model". They include and introduce the foreign capital exchange shortage as another possible growth

constraint. Hence, developing countries highly require importing goods and services, which are vital to investment and production; nonetheless, import requirements usually exceed export earnings in LDCs.

Investment can be constrained either by a shortage of domestic savings (the savings gap) or by a shortage of exports earnings (the trade gap) (Chenery and Strout (1966, 1979)). Therefore, "foreign aid inflows in particular, and foreign capital inflows in general, are needed to fill the prevailing gap, so that countries can grow more rapidly than their internal resources would otherwise allow. If these inflows do not exist, the country will experience slower growth and inefficient employment of internal resources (labour and natural resources). The desirable outcome is self-sustaining growth".

Lance Taylor (1994)

Following the crippling debt crisis of the 1980s, Bacha (1990) and other neo-structuralist authors, like Lance Taylor, introduced a third fiscal gap between government revenue and expenditures. "The three-gap model predicts that government budget limitations rather than foreign exchange constraints or an overall savings restriction, may be binding. If foreign aid supplements government revenue, then it promotes economic growth".

2.3 Definition of Foreign Aid

Economists have defined foreign aid as any flow of capital from the richer countries to governments of less developed countries (LDCs) that meets two criteria's:

- its objective should be noncommercial from its point of view of the donors,
- It should be characterized by concessional; that is; the interest rate & the repayment period for borrowed capital should be softer (less stringent) than commercial terms. However, military aid has excluded from international economic measurements of foreign aid flows.

  Therefore, the concept of foreign aid that is now widely used and accepted is one that encompasses all grants and concessional loans, in currency or in kind, that are broadly aimed at transferring resources from developed to less developed nations on development, poverty, or income distribution grounds (Todaro & c. Smith, 2009)

Foreign aid can also be defined as the transfer of real resources from governments or public institutions of the richer countries to governments of less developed countries (LDCs) in the third world.

2.4 Types of Foreign Aid

The two main ways of foreign capital inflows are official flow and private flows. The official flows are mainly through bilateral and multilateral flows. (Keeley, 2012)

2.4.1 Bilateral Aid:

Bilateral aid is the type of aid, which is given from the government of the donor country to the government of recipient country. This type of aid is generally depends upon political and economic relationships of various countries and the will of donor country. (Keeley, 2012)

2.4.2 Multilateral Aid Flows:

Multilateral flows consist of capital flows from multilateral organizations such as the World Bank, the United Nations; the IMF etc. in the forms of grants, loans or grant-like contributions. It is also a type of foreign aid, which has given by certain financial institutions, agencies or organisations to the government of developing countries. This type of aid is distributed in a fair manner in order to raise the pace of economic development. (Keeley, 2012)

Multilateral aid is better than bilateral aid, as bilateral aid is mostly given based on political considerations and the fear of domination by the donor country, these scenarios has removed in the case of multilateral aid, which may be ultimately helpful in raising the pace of economic development. Multilateral aid can also be categorized as financial aid, commodity aid, food aid and technical aid. (https://sites.google.com/site/maeconomicsku /home/ foreign-aid)

a) Financial Aid: Financial aid is the simplest form of capital inflow from developed to countries to less developing countries. It is the donation of exchangeable foreign currency, but mostly very little foreign capital comes to the underdeveloped nations that is so conveniently. Financial aid can be further divided into Tied aid, untied aid, grants, and loans. (https://sites.google.com/site/maeconomicsku /home/ foreign-aid)

Tied Aid is the type of aid, which is given by a certain nation to the recipient country on the condition that the receiving country will spend it in the donor country to solve the deficit in the trade balance problems of that country. (Keeley, 2012)

Untied Aid is a form of aid, which is not tied to any project or nation. It can be given in all respects, and it is better than the tied aid because it offers more efficient utilization of foreign resources. (Keeley, 2012)

Grant is another form of foreign aid, which does not entailed either the payment of principal or interest (no explicit obligation). It is a free donation from the donor country government to receiver country government or from an institution to a government receiver country. It is much a desired form because; it increases the internal expenditures and generates income. (Keeley, 2012)

Loan is a debt usually project-specific and repaid. It may be in either a soft or a hard loan. A **soft loan** is a loan with comparatively in concessional or loose terms, it typically has an interest rate below the market rate (or sometime no interest at all) and long or flexible maturities. A **hard loan** is a foreign *loan* that has to be paid in *hard* currency, which is the currency of a nation that has political stability and a reputation for economic strength. (Keeley, 2012)

b) Commodity Aid a type of multilateral tied aid, which relates to agricultural products, raw materials and consumer goods. Donor countries mostly influence this type of aid politically. It is mostly received either in cash form or in food grain form. Commodity aid in cash form is more helpful for recipient country than in food grain form because it allows flexibility to buy more commodities from cheaper sources. (https://sites.google.com/site/maeconomicsku /home/ foreign-aid).

c) Technical Aid: is another form of multilateral tied aid, which is much useful for the recipient country to increase the pace of economic development by using the modern technology or some specific skill in the economy. Under this aid, the donor country's government provides programme, scholarship or training facilities. In general, it bears all the expenditures involved in the training including the advisory cost. Technical assistance may be given in the form of recruitment for a selected people of recipient country in the donor country in service areas, partly & often largely at the expense of the donor government. Technical assistance can also be given by arranging a scholarship and training facilities in donor country for foreign students coming from the recipient country. (Keeley, 2012)

d) Voluntary Aid: It is aid mostly used to assist people in the form of charity. Like Doctors without borders (Médecins Sans Frontier's) "is an international humanitarian non-governmental

organization best known for its projects in war-torn regions and developing countries affected by endemic diseases". (Keeley, 2012)

2.5 Motives of Foreign Aid

Less- Developing Countries (LDC's) usually have a shortage of foreign exchange, which is needed for importing necessary capital and intermediate goods. In this case, foreign aid can minimize the foreign exchange constraint and raise the rate of economic growth. External resources can also play a crucial role in supplementing domestic resources in order to relieve savings and government expenditure scarceness. Chenery and Strout (1966, 1979)

The economic objectives of foreign aid are therefore, to alleviate poverty and increase savings, investment, supplement government budget and enhancing the rate of growth of GNP in developing countries. However, development assistance has not always succeeded in achieving these objectives because in many cases donor motives for giving aid and recipient motives for accepting it may conflict with the economic objectives of foreign aid. There is no historical evidence that over large periods of time donor country assist others without expecting some corresponding benefits that can be political, economic or military in return. (Todaro, M.P. 1989,) indicates that there are likely to be fundamental differences in attitudes and motivations between donor and recipient countries Thus, foreign aid is a difficult term, especially, when it is used to manipulate a variety of resource transfers from developed countries to developing countries.

Why Donors give Aid?

According to (Keeley, 2012),there are several motives, which inspire financial assistance from public bodies, such as humanitarian and humanitarian, political, commercial, military and economic. However, there is no significant evidence to suggest that over longer periods donor countries assist others without expecting some corresponding benefits. Instead, many donor countries consider their national economic interest, political and strategic interest in return while providing aid to developing countries. Some of the Motives can be:

Moral and Humanitarian Motives: Most donors inspire aid for moral obligation emphasizing that social welfare should be promoted in the LDCs so as to decrease the inequality between the poor and rich groups. Donor provides aid for moral and humanitarian reasons to assist the poor, like emergency

food relief programs. Others donors thought aid as a compensation for their past exploitation and colonization of LDC's. Therefore, most developing countries accept assistance in the form voluntary, charity and emergency like disaster in addition to the formal form, which is as a part of their regular aid program. (Griffin and Enos, 1970)

Political, Commercial and Military Motives: In this type of motives donors principally motivated by their political intuitive rather than moral and humanitarian to give aid. For instance, countries like Turkey, Egypt, Greece, and Israel have a great geopolitical significance to the United Stated and thus receive more aid than other countries .As (Todaro, 1989) express that the direction of total aid is not always given to the neediest countries. Less than half of bilateral development aid goes to the forty-six countries with the lowest incomes. Most aid based on political and military considerations goes to relatively well-off Third World countries. Therefore, it can be said that, especially the decision to grant aid to the country is fundamentally a political decision. In other words, foreign aid from the powerful to the relatively to less power countries is an instrument of power politics.

Economic Motives: Thirlwall, (1990) stated that part from political and military motives, there are also some commercial motives for giving aid as they get economic benefits as a result of their aid programs. Therefore, some interested groups in the DCs gain some benefits from aid. These interested groups include: exporters of goods and services bought by aid-recipient countries, those who have extended loans and credits to aid-recipient governments whose ability to repay them depends critically on continuing to receive aid funds, and those engaged in the aid industry as politicians, administrators and experts . It can also be the case that, if foreign aid is useful in stimulating the growth rate of national income in a developing country, the effect of foreign aid can expand the demand for goods and services of developed countries.

Why Developing Nations Accept Aid?

From a number of reasons the study identified three important reasons why developing countries have been eager to accept aid, even in its most rigorous and restrictive forms:

Economic Reasons: White (1993) concluded that developing countries have often tended to accept uncritically the proposition that aid is a crucial and essential ingredient in the development process. It supplements scarce domestic resources; helps transform the economy structurally and contributes to the achievement of LDC's take-offs into self-sustaining economic growth. Thus, the economic

rationale for aid in LDCs is mainly initiated from the donor's perceptions of what the poor countries require to promote their economic development.

Political Reasons: here both donor and recipient as providing greater political advantage, to the existing leadership to suppress opposition and maintain itself in power, in this case aid is considered as a tool. The problem is that once aid is accepted, the ability of recipient governments to remove themselves from implied political or economic obligations to donor interference is obvious, including on their internal after. (Keeley, 2012)

Moral Motivation: Whether on grounds of basic humanitarian responsibilities of the rich toward the welfare of the poor, or because of a belief that the rich nations owe poor nations principles money for past exploitations. Many advocates of foreign aid in both developed and developing countries believe that rich nations have a responsibility to support the economic and social development of the third world. They further uses this link this moral obligation with the need for greater LDC sovereignty with respect to the allocation and use of aid funds. Here developing nations pressed for substantial increase in foreign aid to permit them to pursue environmentally sustainable development programs. Implicit was that industrialized countries were the major polluters of the world and they had no moral to tell LDCs to slow their growth to save the planet from environmental Pollutions. (Keeley, 2012)

2.6 Functions of Foreign Aid

Refereeing to (United Nations, 2006) the pro-foreign aid arguments consider foreign aid as an important contributor for economic development. According to this argument, effectiveness of foreign aid rests on three basic propositions. The first one is that, the key to economic development is the availability of capital, secondly, under developed countries are too poor to provide capital for themselves and thirdly, centralized and comprehensive economic planning and control by governments is an essential requisite for economic development. Generally, there are two contributions of aid in economic development process:

1. It assists countries in implementing payment & public measures, which will mobilize and reallocate their human & material resources for maximum economic progress.
2. It supplements countries domestic resources for higher rate of growth and social progress.

(IPRI Journal, 2005) stated that ccountries, which are not making satisfactory progress regardless of their per-capita income, have failed to realize the potential returns from their own resources. The required thing here is that developing appropriate policies & programs for mobilizing, adapting, reallocating these resources and working on human development strategies. Therefore, these are the two main functions of foreign aids:-

The first function of foreign aid is to facilitate economic and social transformation by overcoming temporary shortages in specific human and material resources, by promoting strategic activities, by designing, facilitating critical government policies & providing a certain margin of resources for carrying out the programs involving a shift in the structure of the economy. This function of aid is sometimes regarded as necessary to remove the skill limitation on growth or to increase capital absorptive capacity. (IPRI Journal, 2005)

The second function of foreign aid is assisting as a supplemental resource from outside but by further organization & reallocation of its internal resources for productive investment. One of the first individuals who developed a theory of aid based on Keynesian aid theory is Rostow. The major stages in ROSTOW'S theory of stages of growth are the process of the take off in the self-sustaining growth. Rostow based on the Harrod-Domar long-term economic growth model says that one of the necessary conditions for take-off to occur is an increase in the rate of net investment in the economies of poor nations. According to him domestic saving during take-off period could be supplemented by economic aid in order to attain the level of investment required. In this case, aid speeds up the process of reaching the stage of self-sustained growth.

2.7 Arguments of Foreign Aid

The purpose of foreign aid program to LDC's is to accelerate their economic development up to a point where a satisfactory rate of growth can be achieved on a self-sustaining basis. Thus, the over-all aim of foreign aid is to provide least developing country a positive motivation for maximizing their national effort in order to increase its rate of growth. However, according to different scholars the economic and social benefit of foreign aid given for developing countries have been controversial issues. Some economic studies of foreign aid suggest that it has a positive impact for economic development; other studies find that there is no relationship between foreign aid and growth rate of output and suggest that even it retards economic growth in developing countries by leading to the structural distortions of the economy. (IPRI Journal, 2005)

2.7.1 Supportive Arguments: Economist from Pakistan: AR Kamal (2001), Parvez Hasan (1999) Pervez Tahir (1998), Rehana Siddiqui (2001) express the positive impact of foreign aid which are discussed below:

Starvation and Malnutrition: In this case, foreign aid is beneficial to avoid starvation and malnutrition resulting from drought and natural disasters in the LDCs. Although the use of foreign aid does not directly speed up development process, it is important on humanitarian grounds. Therefore, foreign aid is effective when it is used to tackle the bottlenecks of development effort of LDCs. (IPRI Journal, 2005)

Invest More than Savings: The main feature of developing countries are their level of saving is very low in order to fill their required level of investment. In this case, foreign aid permits the recipient developing nations to invest more than they are able to save domestically, and to import more than they can finance through theirs exports. Therefore, foreign aid makes them able to fulfill this gap and undertake new projects for their development and prosperity. This is the way, which foreign aid makes investment more than savings. (IPRI Journal, 2005)

Import more than the Exports: In developing economies, the export volume is low and consists of raw material and agricultural products whose prices are very low in international markets, which is the main reason of developing economies to have low export earnings. In the reverse, they require more import of goods and services, such as machineries, new technologies, experts' services, medicines etc. for their development. In this case, foreign aid makes it possible for them to import more than their export earnings and accelerates their economic development. (IPRI Journal, 2005)

Important for Capital Formation: Foreign aid is essential for capital formation and break the vicious circle of poverty. In LDCs, since there income level is very low, they are constrain by low savings, which are almost nil. People hardly fulfill their basic needs. This low or lack of savings create a condition of low capital formation in the country. It is the main reason that make the LDCs very difficult to break the vicious circle of poverty. Foreign aid solves this problem, and gives rise to capital formation through this; the vicious circle of poverty can be broken. (IPRI Journal, 2005)

Source of Cheaper Funds: Due to different types of constraints, Rising of short run fund by LDCs for their economic development is difficult. Therefore, foreign aid provides cheaper funds for the completion of different projects of the economy. It is in this way that foreign aid helps to complete the projects earlier and help economic development faster. (IPRI Journal, 2005)

Technological Progress: Foreign aid not only helps to overcome the deficiency of capital but it also helps to overcome the technological backwardness. Foreign aid, besides transferring physical and financial capital to developing countries, also brings in the technical knowledge, highly qualified persons with administrative experience and advanced techniques of production. It provides opportunities for local labor to be trained in new skills. Therefore, foreign aid accelerate the rate of economic growth in way. (IPRI Journal, 2005)

Establishment of Heavy Industries: Foreign aid can help to acquire financial resources required for the establishment of basic industries and with its help, the required complicated modern machinery can be imported from other countries. Thus, foreign aid can help developing countries to establish steel tools, machines, heavy mechanical, heavy chemicals and other key industries. Establishing of heavy industries make the external economies to emerge and by this the costs of production of other industries decline, which help in their expansion. Consequently, foreign aid can play significant role in the industrialization of the economy of LDCs. (IPRI Journal, 2005)

Establishment of Risky Ventures: With the help of foreign aid, significant risky businesses can be established. Foreign aid besides providing opportunities for economic growth it is a mean in opening up inaccessible regions for development and utilize idle natural resources, which can help to solve the regional imbalances of the country. (IPRI Journal, 2005)

Increase in Employment Opportunities: Foreign aid increases employment opportunities by helping the government of LDC by build overhead capital; by establish new industries, by utilization of idle natural or other resources and by opening up inaccessible regions. Whenever, foreign aid used for import of capital goods it increases employment opportunities in urban areas. As a result surplus labor from rural areas moves in search of jobs to urban areas and thus it helps to reduce the disguised unemployment and helps to lessen the burden of population on agricultural lands. Therefore, foreign aid in this way is source of some social benefits. (IPRI Journal, 2005)

2.7.2 Non-Supportive Arguments: Even though some economists suggest that foreign aid has a positive impact for economic development; other opponents Griffen and Enos (1970) and Weisskopf (1972) and Ridell (1987) and While (1992) are suggesting that, it retards economic growth in developing countries by developing structural biases of the economy. Accordingly, the negative impact of foreign aid can also presented as follows: (IPRI Journal, 2005)

Foreign Aid will not Increase Net Investment: Foreign aid will not always bring an increment in net investment. In fact, all LDCs receiving foreign aid impose severe restrictions on the inflow and use of foreign capital. These retard the operation and expansion of private enterprise within the economy. Consequently, both foreign and domestic private enterprises are forced to work below their capacity. In this case, foreign aid may reduce rather than increase net investment within the recipient country. Moreover, many developed countries may train workers of LDCs according to circumstances of developed countries, which cannot be applicable & perform an active role in their own countries. (IPRI Journal, 2005)

Developed countries have & are applying advanced technology according to their own needs. But, when such technology is imported to developing countries, it becomes difficult to fully utilize the technology. In this circumstance, aid recipient countries highly influenced by of donor country. (IPRI Journal, 2005)

Leads to Social and Political Tensions: Foreign aid has immensely influenced the socio-political life of developing countries. It has helped the rulers to extend their arms to prolong their rule and to suppress opposition. In this way foreign aid promotes social and political tensions and eventually it could result in halting economic development of a developing country. High interference of the donor country both in political and economic affairs of the recipient country may put its sovereignty and self-reliance at stake. (IPRI Journal, 2005)

Too Much Dependence on Aid: recently, a recipient country's dependence on donor countries increases excessively. Foreign aid expose a recipient country vulnerable to interference by donor countries. Foreign aid is mostly tied to the donor country's exports and recipient countries are involuntary import goods and services from donor countries. As the result future spare parts and auxiliary machinery are required to be imported from the same donor country. Many conditions to be fulfilled imposed by donor countries on recipient countries during facilitation of foreign aid. In this way by accepting foreign aid, a recipient country becomes heavily dependent on donor countries political influence. (IPRI Journal, 2005)

Increase Inflation: If the aid given is concerned with unproductive fields or old technology, it will have the effect of increasing inflation in the country. (IPRI Journal, 2005)

2.8 The Significance of Foreign Aid in Economic Development

In accelerating economic development in less-developed countries, public foreign capital is more important than private foreign capital because the financial needs of less developed countries (LDCS) are so great that, private foreign investment cannot solve the problem of financing due to its limited capacity. Moreover, private foreign investment will not involve in social expenditures like, public health, education programs, technical training, researches etc. Therefore, these sectors have to be financed with the help of grants received from advanced countries in the form of public foreign aid, as they require a large sum of private capital. Therefore, investment in low yielding and slow yielding projects could be possible only based on foreign aid. Moreover, unlike foreign aid, private foreign investment can supplement to fill investment gap of a country in certain level in accordance with its development programs. Therefore, much cannot be expected from foreign private investment. (Chenery and Strout (1966, 1979))

2.9 Determining factors of aid effectiveness

The amount of foreign aid flowing to less-developing countries depends upon a number of factors. Some of them are:

1. **Availability of Fund**. Developed countries should have enough extra fund for donation. Some of the developed countries like Canada and Australia themselves borrow from the United States and Great Britain to finance their development projects. However, a genuine effort on the part of rich countries to mop up surplus capital need some requirements to be satisfied by LDCs. (www.academia.edu)
2. **Capacity to Absorb Capital**. Which covers all the ways in which the ability to plan and execute development projects, to change the structure of the economy, and to reallocate resources in circumscribed by lack of crucial factors, by institutional problems or by unsuitable organization. The structure of the economy along with the utilization of its existing capacity will have an important bearing on a country's absorptive capacity. Inadequacy of overhead facilities like power, transport, etc., in LDCs keeps the capacity to absorb foreign aid is low. Lack of efficient entrepreneurship, administrative and institutional bottlenecks, the lack of trained personnel, the lack of geographic and occupational mobility, and the small size of the domestic market. These handicaps keep the marginal productivity of capital is low in LDCs and prevent the proper use of

foreign aid for the execution and completion of development projects. I.e. in short they lack pre-investment projects. (www.academia.edu)

3. **Availability of Resources & Capacity to Repay the Loan**. If an LDC has little adequately developed human and natural resources, it will act as an obstacle to the effective use of foreign capital and will be very difficult for such a country to utilize the available foreign aid if it lacks in human and natural resources. The requirement for payment is that, the fiscal system raises the necessary funds, and the transformation occurs to shift resources into export increasing or import decreasing lines. If loans flow in a steady and increasing stream and for very long periods with liberal terms of repayment, the problem of repayment is easy. (www.academia.edu)

2.10 The Role of Foreign aid in Ethiopian Economy

2.10.1 An over view of Foreign aid in Ethiopian context

Foreign aid has played a major role in Ethiopia's development effort since the end of World War II. It has been instrumental in bridging the country's savings-investment and foreign exchange gaps. Its importance as a source of financing for the development of capacity building (human capital, administrative capacity, institutional building, and policy reforms) is also unquestionable. Thus, increasing efforts were made to mobilize foreign aid in the last two regimes. Following the change in political regime in 1991 and the adoption of the structural adjustment program in 1992/93 in particular, the country has enjoyed a significant amount of aid. A large and growing inflow of concessionary loans and grants has occurred since 2001. Following the issuance of the first poverty reduction strategy paper (known as the Sustainable Development Poverty Reduction Program) mainly gained from 14 multilateral sources; mainly IDA, EC, the Global Fund, and the African Development Fund and; more than 30 bilateral sources; mainly the USA, UK, Italy, Canada, Germany, Ireland, Japan, Netherlands, Norway, and Sweden (Getenet, 2009).

Ethiopia has been one of the major recipients of international aid in recent times. According to OECD-DAC statistics, net ODA to Ethiopia amounted to US$1.94 billion in 2006, making it the 7th largest recipient among 169 aid receiving developing countries. In absolute terms, the amount of ODA has risen sharply from an average of $881 million per annum in the second half of the 1990s to over $1574 million per annum for the first half of the 2000s. For the years (2000-2006), ODA has averaged at $1683 million per year. The average contribution of bilateral donors to ODA over the eight-year period was $322.4 million per year accounting for 31 percent of ODA. In the 1990s, some 49 percent of the

total net ODA was in the form of multilateral aid. This was slightly reduced to 46 percent for 2000-2006, reflecting the increased importance of non-multilateral sources (Devex Editor, 2009).

2.10.2 Resource Gap Trend of Ethiopia

The key determinants that significantly affected the economic growth of Ethiopia include physical capital, exogenous factors (foreign aid, external debt and foreign direct investment), demographics, trade, human capital, fiscal policy etc.

Investment can be constrained either by a shortage of domestic savings (the savings gap) or by a shortage of exports earnings (the trade gap) (Chenery and Strout (1966, 1979) two-gap model). The third fiscal gap is the deficit between government revenue and expenditures that is, government budget limitations.

Table 2.1 Expenditure on GDP and Gross Domestic Savings (Percentage of GDP)

Years	Domestic Absorption	Consumption Expenditure			Gross Capital Formation	Resource Balance	Export of Goods & Services	Import of Goods & Services	Gross Domestic Saving
		Total	Gov.	Private					
2005	116.8	87.9	18.1	69.7	29.0	(19.7)	14.6	34.3	12.1
2006	119.6	88.9	17.9	71.0	30.7	(22.0)	13.4	35.3	11.1
2007	111.3	84.3	15.4	69.0	27.0	(18.7)	12.3	31.0	15.7
2008	114.1	86.9	14.3	72.5	27.3	(18.8)	11.0	29.8	13.1
2009	113.6	85.9	13.0	72.9	27.7	(17.6)	10.2	27.8	14.1
2010	116.3	86.2	12.6	73.6	30.1	(18.7)	13.2	31.9	13.8
2011	113.8	82.7	11.8	70.9	31.1	(14.5)	16.3	30.7	17.3
2012	116.4	80.4	9.5	71.0	36.0	(17.4)	13.4	30.8	19.6
2013	115.2	82.2	10.2	71.9	33.0	(16.1)	12.2	28.2	17.8
2014	116.2	79.3	10.6	68.8	36.8	(17.0)	11.3	28.4	20.7
2015	116.1	77.9	10.3	67.6	38.2	(20.4)	9.1	29.5	22.1
2016	115.0	77.6	11.1	66.5	37.3	(19.3)	7.8	27.1	22.4
2017	116.1	77.6	11.1	66.5	38.4	(15.8)	7.6	23.5	22.4
2018	109.8	75.7	10.2	66.5	34.1	(14.4)	8.4	22.8	24.3
2019	112.9	77.7	9.2	68.7	35.2	(12.9)	7.9	20.8	22.3
2020	109.8	79.1	9.1	70.0	30.8	(9.8)	7.1	16.9	20.9
Average 2005-2012	115.24	85.40	14.08	71.33	29.86	(18.43)	13.05	31.45	14.60
Average 2013-2020	113.89	78.39	10.23	68.31	35.48	(15.71)	8.93	24.65	21.61
Average 2005-2020	114.56	81.89	12.15	69.82	32.67	(17.07)	10.99	28.05	18.11

Source: Planning and Development Commission and National Bank of Ethiopia

2.10.2.1 Saving and Investment Gap of Ethiopia

In less developed economies, like Ethiopia a savings gap commonly refers to the deficit between current aggregate savings and the level of savings required to provide funds for business investment. We call this gap a 'savings-investment' gap.

Normally, in simple economy: saving = investment, this is because, available savings in the economy determine investment. In this case, excess saving encourage domestic saving through banks loan, which lend more to firms to finance investment projects. In a simple economic model, we can say the level of saving will equal the level of investment in equilibrium case.

From table 2.1, the saving investment gap for the year 2005 – 2020 at average is 14.56 % percentage of GDP.

2.10.2.2 Trade Gap of Ethiopia

It is a situation in which a country buys more from other countries than it sells to other countries; the amount of money by which a country's imports are greater than its exports. A trade deficit is a condition in which the cost of a country's imports surpasses its exports. It arises in the course of international trade when the payments for imports exceed the receipts from export trade.

A trade deficit creates downward burden on a country's currency under a fluctuating exchange rate system. With a cheaper domestic currency, imports of goods and service is more expensive in the country with the trade deficit. High trade deficits can create the condition of the country highly desirable destination for foreign investment.

From table 2.1, the trade gap for the year 2005 – 2020 in average is 17.06 % percentage of GDP.

2.10.2.3 Fiscal Gap (Budget Deficit of Ethiopia)

A government develop a fiscal deficit when it spends more money than it collected taxes and other revenues excluding debt over some period.

Over the period 1970/71-1973/74, total government revenue (including grants) as a ratio of GDP averaged at 6.01 percent, while the ratio of government expenditure to GDP averaged 6.88 percent. The resulting budget deficit amounted only 0.87 percent of GDP (MoFED, 2011). The military regime achieved a remarkable growth in revenue collection. However, due to higher growth in government

expenditure the Derg period was characterized by the worsening budget deficit. Between 1974/75 and 1990/91, the ratio of total government revenue and total government expenditure to GDP averaged at 11.5 percent and 16.83 percent respectively. Thus, the ratio of budget deficit to GDP averaged at 5.43 percent. The growing deficit was financed by large through borrowing from the central bank and external loans, which had nearly equal share in deficit financings and is inflationary (MoFED, 2011).

Between 1991/92 and 1997/98, the ratio of the total government revenue and total expenditure to GDP averaged at 11.7 and 18.31 percent respectively resulting an average 6.61 percent budget deficit to GDP ratio. Over, the two years of Ethio-Eritrean border conflict, the ratio of total government expenditure, revenue, and deficit jumped to an average of 24.96 percent, 15.0 and 9.96 percent respectively. While, over period 1999/00 - 2010/11 total expenditure and revenue on average account about 22.26 and 14.27 percent of GDP. The deficit gap is 7.99 percent of GDP. In addition, the highest overall budget deficit in modern history of Ethiopia scored in 1999/00 and 2002/03, which is 11.65 and 11.96 percent of the GDP respectively (MoFED, 2011).

Finally, empirical result from table 4.2 shows that the average budget deficit of Ethiopia from year 1993 to 2018 including the grant received is 12.10 Billion Birr in adjusted real value. The fiscal deficit data shows that, there is a significant increase of the government budget limitation in the recent years specially, from the year 2013.

Table 2.2 Fiscal Deficit (Including Grant)

In Millions of Birr

Year	Amount	Year	Amount
1993	-1,562.1	2006	-6,063.0
1994	-2,167.7	2007	-6,226.0
1995	-1,327.5	2008	-7,210.0
1996	-2,131.2	2009	-3,147.0
1997	-636.5	2010	-5,097.4
1998	-1,332.2	2011	-8,220.2
1999	-3,481.9	2012	-8,758.2
2000	-6,231.0	2013	-16,736.2
2001	-2,510.8	2014	-27,395.3
2002	-4,818.0	2015	-30,882.1
2003	-4,793.0	2016	-29,258.5
2004	-2,586.0	2017	-60,180.9
2005	-4,743.0	2018	-66,643.2

Source: Ministry of Finance and Economic Development (MoFED)

2.10.3 Official Development Assistance (ODA) Disbursement

During 2019G.C, 37 development partners disbursed a total of USD 4.0 billion for 332 projects implemented by the government across multiple sectors throughout the country. This shows an annual increase of 14.5% (USD 506 million) when compared to the previous year (USD 3.4 billion). The disbursement during the year was 4.1% of GDP or is equivalent to 11.9% Gross capital formation. Out of the total disbursement, grant accounted for 55% and loans accounted for 39% while the remaining 6% was technical assistance. The share of grant has been in declining trend until end of 2017G.C, and then after it has started increasing, in 2019G.C the share disbursement in the form of grant has increased to 55% from 46% in 2018G.C. Similarly, the share of loan has decreased to 39% from 51% in the previous year. The increase in disbursement during 2019G.C was mainly due to disbursement of USD 1.2 billion to development policy financing project by IDA among others. In year 2019G.C, 20 development partners have reduced their disbursement for the projects implemented by government institutions while 17 development partners have increased when compared to disbursement performance of 2018G.C (MOFED, 2018).

2.10.3.1 Disbursement by Development Partners to government

The GTP II financial resource projection plan cites external resources as an additional source of finance for the implementation of the GTP II. During 2017G.C, 32 development partners disbursed a total of US$ 3.0 billion, and this shows an annual decrease of 4.5% (US$ 144 million) when compared to the previous year (US$3.1 billion, EFY 2016G.C) performance and equivalent to 3.7 % of GDP and USD 32.2 per capita. Out of this, grant accounted for 44% of the total while loans represented 56%. The share of grant support in total development assistance has decreased slightly from 79% in 2008G.C and 47% in 2016G.C to 44% in 2017G.C. The decrease in 2017G.C is mainly due to decrease in grant disbursement from DFID by 42 %(US$ 163 million) when compared to the previous year. During 2017G.C, 19 of the 33 development partners have reduced their disbursement to Ethiopia while the remaining 14 have increased it. DFID, WFP and IDA are the top three donors whose disbursement declined by US$ 162.9 million, US$ 36.5 million and US$20.4 million respectively in EFY 2017G.C, when compared to EFY 2016G.C(MOFED, 2018).

During 2019G.C, Multilateral and Bilateral development partners disbursed USD 2.9 billion (73 %) and USD 1.1 billion (27%), for the implementation of 161 and 171 projects/programs, respectively. Out of the total disbursement of bilateral partners USD 574.7 million (53%) was from EU member bilateral partners while USD 515.9 million from non-EU member bilateral partners. Disbursement

from non-EU member bilateral partners decreased by USD 30 million (5.4%) when compared to the previous year. The sum of disbursement from EU member bilateral partners & European Union was USD 732 million that decreased by USD 63 million (8%) as compared to previous year. (MOFED, 2018).

• European Union contributed USD 157.6 million (4% of the total), its disbursement increased by 62% (USD 17 million) from the previous year.

• International Financial Institutions disbursed USD 2,558.9 million (61% of the total), which increased by 45% (USD 797.8 million) when compared with EFY 2010.

• UN Agencies disbursed USD 195.2million7 (5% of the total) which decreased by 5% (USD 199 million) from the previous year. (MOFED, 2018).

Table 4.3 Top Development Partners

Top five development partners by their total disbursement: (2016)	Top five development partners by their grant disbursement: (2016)	Top five development partners by their loan disbursement: (2016)
IDA (1152million USD)	DFID (385.7 million USD)	
DFID (385.7 million USD)	WFP (262.5 million USD)	
WFP (262.5 million USD)	USAID (244 million USD)	
USAID (244 million USD)	UNICEF (155.7 million USD)	
ADB(225.2 million USD)	EU (85.2 million USD)	

Source (Annual Statistical Bulletin on Official Development Assistance (ODA) Flows to Ethiopia EFY 2008)

Top five development partners by their total disbursement: (2017)	Top five development partners by their grant disbursement: (2017)	Top five development partners by their loan disbursement: (2017)
IDA (1125million USD)	USAID (247.3 million USD)	IDA(1062.2 million USD)
China (249.6 million USD)	WFP (225.9 million USD)	China(249.5 million USD)
USAID (247 million USD)	DFID (222.9 million USD)	ADB(215.8 million USD)
DFID (222.8 million USD)	UNICEF (135.9 million USD)	IFAD(50.8 million USD)
ADB(217.8 million USD)	EU (103.3 million USD)	OFID(40.8 million USD)

Source: (Annual Statistical Bulletin on Official Development Assistance (ODA) Flows to Ethiopia EFY 2009)

2.10.3.2 Disbursement by Sectors

The reallocations in disbursement in the periods between 20015G.C and 2008G.C indicated that disbursement increased to four out of the nineteen sectors, agriculture from economic sector increased by 93%. Among the reasons for increase in disbursement for agriculture sector was the large disbursement for the new phase Productive Safety Net Program IV, from IDA (US$ 425 million) and DFID (US$ 149.4 million) could be cited. Disbursement to social service sectors: Health, Education

and Water Supply and Sanitation decreased during the reporting period when compared to the previous year. Out of the total disbursement for cross cutting sectors(US$ 558.63 million) almost one third(US$ 221.6 million)was for PBS(US$ 45.4 million) and Enhancing Shared Prosperity Through Equitable Service(ESPES)-the Program for Results (P4R)(US$ 176.46 million).ESPES is continuation of PBS, for supporting the budget in result based modality (MOFED, 2018).

The overall disbursement to service sectors (health, education and water supply & sanitation), infrastructure sector (energy and transport), and multi sectors/cross cutting sector has declined during 2019G.C. The reasons for the decline in disbursement among others were due to partial fulfillment of DLI3 of health sector budget support program (EU), Health SDG program (IDA), GEQUIP-E (IDA). In addition, some projects entering completion phase such as: GEQUIP-E (IDA), TB and Malaria projects (GF); One WASH (DFID, ADB, Finland, UNICEF); limited the resources flow. Furthermore, Government decision to stop accessing non-concessional sources also reduces the disbursement flow. The decision was based on the debt distress shift from moderate to high risk (MOFED, 2018)

2.10.4 Empirical Studies of Aid, Growth and Policies in Ethiopia

As Ethiopia's economy is characterized by a massive inflow of foreign capital in the form of foreign aid, it is imperative to review studies conducted on similar area. However, the available studies are quite few in number.

Tasew (2011) tried to evaluate the empirical result from the investment equation and his estimated result shows that aid has a significant positive impact on investment in the long run and also on aid finances investment in the short run. On the other hand, he tried to show that unpredictability of aid has a negative influence on domestic capital formation. Furthermore, saving and inflation have a negative influence on investment on long run. However, saving has positive short run effect and inflation has negative impact in the short run. The result further shows that debt serving appeared insignificant.

Finally, his result indicate that foreign aid has positive impact on economic growth in long run and insignificant in short run. He identified that when aid is combined with good policy has positive effect on growth and when aid combined with bad policy, it has deleterious impact on growth in the long run. He also indicate in his model using variable Aid squared, unlike the theoretical view, has a positive sign, pointing the absence of capacity constraint in the flow of aid to Ethiopia. Indeed, he request for a deeper investigation and further research on the absorptive capacity of the country regarding aid flow.

Mesfin (2007) examined the fiscal impact of foreign aid (disaggregated in to loan and grant) and its overall relationships with economic growth in Ethiopia covering over the period 1960/61 to 2004/05. He analyzed the data by applying a vector autoregressive modeling mechanism. The outcome has indicated that foreign aid inflow has a strong positive relationship with growth in the long run. The result further indicated that the positive association between foreign aid and economic growth is attributed to the incremental effect that aid on government expenditure i.e. one mean of transmission of foreign aid to growth is through the channel of government expenditure. The outcome of the study also showed that foreign aid inflow has a negative impact on tax revenue but it improves the fiscal position (closing the fiscal gap) unlike government expenditure.

In general, his study describe that increases in foreign aid result in higher government expenditure, and has significant positive long-term impact on economic growth. However, his investigation did not distinguished the domestic and foreign aid financed government expenditure. As a result, correlation has existed between government expenditure and foreign aid in the determination of the growth model, this result in wrong conclusion due to in the problem of double counting. Despite the mentioned problems, the study indicate that, there exists a long run role foreign aid effectiveness in Ethiopia.

Tolessa (2001), examined the relationship between foreign aid (in disaggregated form: loan and grant), domestic savings, investment and economic growth for the period 1964/65 to 1998/99 using Johansen's maximum likelihood estimation procedure. His finding result come in the conclusion that in addition to domestic saving, external loan has boost domestic capital formation. However, his finding has concluded the insignificance of the grant element of foreign aid domestic capital formation.

2.10.5 Predictability and Volatility Nature of Foreign Aids in Ethiopia

The reason why predictability and volatility of aid matters is that for developing countries like Ethiopia, aid is an important source of public spending. Accordingly, the government has significant target for foreign aid revenue, and integrates the expected revenue into its fiscal planning. Presently, the country has a planned to mobilize more than 30 percent of its revenue from foreign aid financing. This means that aid is considered during the first planning stage of revenue and expenditure allocations. Consequently, foreign aid volatile and irregularity challenges the development effort. Unless, the recipient country government is not sure about the volume and the period of aid inflows, it is in a very difficult position to plan and implement development expenditures in line with its development primacies. Therefore, one can say volatile and unpredictable foreign aid are among the

major causes for ineffective and distorted uses of resources, and can compromise growth and development. The other factor that create volatility is political determination of the receiver country in alignment of the donor country (Devex Editor, 2009).

2.10.6 The Key Challenges of Foreign Aid in Ethiopia

In the process of foreign aid, transferring from various developed countries to less developing countries like Ethiopia; the country has encountered a number of challenges so far and is being facing at current level. Some of these challenges are described below:

Foreign aid is not effectively coordinated: Mostly it is fragmented and unpredictable. Several donors have numerous projects around the world but Ethiopia participated only a small share of the aid market. Despite Ethiopia's early initiation in country harmonization and alignment process, both at the sector and country levels, achievements have not been comprehensive. For instance, most multilateral organizations continue to use their own systems rather than aligning and harmonizing in the existing system, hereafter it create challenges during further alignment and harmonization process. These require willingness of sectors and political commitment of donors and their headquarters. Political commitment by donor, Without adequate incentive mechanisms to change the attitude and behavior of donor staff, foreign aid recipient counties are likely to be frustrated by the lack of meaningful progress (Devex Editor, 2009).

Lack of well-structured coordination: Both at the country and at sector level to utilize their full functional capacity is also another challenge. Usually, coordination structures need to work as per the terms of references set by the donor. The concept of work classification by donors through the introduction of lead and silent donors, delegated partnership, or specialization in a few sectors has yet to be practiced in Ethiopia (Devex Editor, 2009).

Existing consultative and coordination mechanisms: Well-structured work line, facilitate the expression of concern by all stakeholders existed at any level. However, in terms of power and decision-making, one can say that the government and donors dominate it. The involvement of the private and NGO sectors is comparatively weak because of their limited roles in service delivery, management, and their weak organizational strength (Devex Editor, 2009).

In General, despite of all the above challenges foreign aid is advocated as necessary for the promotion of economic development in the least developed countries (LDC's) like Ethiopia. The purpose of foreign aid program to LDC's is to accelerate their economic development up to a point where a

satisfactory rate of growth can be achieved on a self-sustaining basis. Thus, the general aim of foreign aid is to provide each LDC a positive incentive for maximum national effort in order to increase its rate of growth using foreign resources for economic development of less developed countries (Rosesentein-Radan, 1943).

CHAPTER- THREE

Research Methodology

In the previous sections, the paper has tried to see the trends, statistics, and pattern of foreign aid and the general economic performance of the country. However, the over whole relationship between foreign aid and economic development cannot be analyzed using simple descriptive data. Therefore, econometrics data analysis can be used as a systematic approach to determine the optimum use of scarce resources, involving comparison of two or more alternatives in achieving a specific objective under the given assumptions and constraints. This chapter explains the statistical methods used to evaluate the extent of foreign aid in economic development of Ethiopia.

In this chapter, the role of foreign aid in economic development of Ethiopia was summarized. The economic benefits are specified in combined effect of the model. Therefore, in this particular methodology foreign aid revenue from different donors of governments or public institutions of the richer countries and combined with the amount of international fund secured by multilateral aid in the specified period will be included. Data collection and organizing approach are mainly described. Finally, the research will systematically identified, collected, organized, discussed and concluded based on accurate information from the data and literature review.

3.1 Data Type and Sources

The research was used descriptive research type, which describes characteristics population; situation and phenomenon that has studied, through this, the research questions have answered. Secondary data was collected for year 1990 to 2019. The study has conducted based on published and unpublished secondary data that has collected from various sources: accordingly, Ministry of Finance and Economic Development (MOFED), National Bank of Ethiopia (NBE), Central Statistical Authority (CSA), University Research Papers, International Monetary Fund (IMF) database, World Bank database and other sources including information from the internet is gathered. The research consider aid modalities like project (program aid) support, Budget support, pooling funds and sector budget support. Bilateral and multilateral funding was aggregated per different budgeting year from 1990 to 2019.

The secondary data was collected for empirical purpose, and data was collected through different official reports, official databases, multilateral donor's database, magazine, research papers and literatures review. This part focuses on answering how, what, when, and where questions of the research problem, rather than the why question.

Finally, for this research purpose, Real GDP calculation using income approach was used and, real value was adjusted for year 2019G.C.

3.2 Research Design and Approach

The research design refers to the overall strategy this research choose to integrate the different components of the study in a coherent and logical way, thereby, ensuring the research has effectively addressed the research problems; it constitutes the blueprint for the collection, measurement, and analysis of data. Research design is the study's conclusion validity. The research has applied the quantitative research approach to examine the contribution of official development assistance (ODA) on real GDP of Ethiopia. Through descriptive method attempts was established to identify cause-effect relationships among the variables. It was used analytical model to analyze the data, which was collected from MoFED, central statistical authorities, national bank, World Bank and other related researches. Foreign aid as grant and recessional loan was evaluated, by aggregated as ODA. The research further identify funds by sector, main donor countries and multilateral institutions to indicate the benefits in different perspective.

3.3 Method of Data Identification and Collection

The research was used censuses data which, whole data are assumed representative. Accordingly: Macro data prepared by MoFED (1993-2018), Annual development cooperation report of Ethiopia by MoFED for fiscal year EPY 2011(G.C 2018/2019), annual statistical bulletin on official development assistance (ODA) flows to Ethiopia by MoFED, March 2018, National Bank annual report (2010-2011E.C), World Bank macro data (1970-2019) are the main sources of secondary data indicated on the research. In addition, public sector external debt statistical bulletin volume 1 to 18 states public sector external debt outstanding, disbursements, debt service payments & debt relief from year 2003 to 2018 are used also used as a source of secondary data. Finally, missed data are collected from different related researches and wave sites.

Econometric model variables: Real GDP, total labour force, investment, domestic saving, official development assistance (grant and external loan separately), general total government expenditure export, import and interest payment on external loans for year 1990 to 2019 are collected from the above stated documents. Then according to the above statement aid as grant and concessional load are given. Based on the above given data, grants and loans amount and repayment amounts are organized to complete the yearly total ODA given in the period 1990 to 2019. Then this was organized in two sample:-

- that fill full grant requirement and
- that fill full concessional load or loan

The research used secondary census data and information on secondhand, which is mostly done as a report, and publication, that was attempted to gather information about every member of the population. Previously, official development assistance was estimated to be in positive correlation with real GDP of Ethiopia.

3.4 Description of Variable

To meet the broad research objective, answer research questions and test research hypotheses the researcher has used the dependent and independent variables.

3.4.1 Dependent Variable

Real GDP of Ethiopia was taken as dependent variable measuring the aggregate supply of the country goods and services for the year 1990 – 2019G.C and real value is adjusted for the year 2019G.C. So that, this is the variable to be significant decide the fate of the country economic development and the main component of the per capita income of the country when it was computed with the total population.

3.4.2 Independent Variable

The composition of these are the main sources of income for the country, on the other hand the increase of one component leads to positive impact on the GDP, the reverse has a negative impact on the GDP. For this specific research gross domestic saving, official development assistance and general government consumption expenditure were the independent variable positively affect real GDP of

Ethiopia. The remaining independent variables total labour force, trade balance and interest payment on external debt were negatively affect real GDP of the country. Finally, the variables are included in the study of the subject matter as an independent variable because of their determination on impact of foreign aid on Ethiopian real gross domestic product.

3.5 Model Specification

From the viewpoint of different literatures, empirical results indicates that the impact of ODA be positive or negative toward RGDP. During calculation of economic variables, they are generally inexact, because, in addition to the above stated variable, other variables affect RGDP. So that, to allow inexact relationship between economic variables, we should modify the deterministic RGDP function to economic model or regression model. In this section, appropriate model used to analyze the impact of foreign aid on economic growth of Ethiopia. Aid growth model with specific variable has briefly specified in their apotheosized sign. This section also described the estimation method of this research.

3.5.1 Functional Relationship

As the research have discussed on the previous chapters different types of studies were undertaken to recognize the role of foreign aid in economic growth of Ethiopia. Different methods and variables have used to undertake the analysis. It is difficult to analyze the impact of foreign aid on all sectors and variables at this level; therefore, the major objective of this research paper is to analyze the impact of foreign on economic growth of Ethiopia using specific growth model in measured monetary terms. The growth model equation is based on aggregate production function (APF) and the theoretical background stated on the first part of the chapter.

The research used the Aggregate Production Function (APF) as the underlying model to estimate the Aid-Growth relationship in Ethiopia. The standard neoclassical growth model predicts that labour and capital inputs are able to explain the bulk of economic growth patterns in a given country, thus the model is developed, in conservative manner, from a production function and foreign aid is introduced as an input in addition to labour force and domestic capital. There is still the possibility to account for the role of other explanatory variables in creating output changes. Such factors have considered based on further theoretical foundations as well as the country-specific characteristics. Among such factors,

the research paper consider and centered foreign aid as a percentage of real GDP, government expenditure as a percentage of real GDP, trade balance as a percentage of real GDP and interest payment have taken as possible growth model variables. The standard APF model has been broadly used in econometric studies to estimate the impacts of foreign aid on growth in many developing countries. Primarily, the APF model has used by Feder (1983), Fosu (1990).

Aggregate production function (APF) specifies that, the factors of production and the production technology determine the level of output in an economy, which can be summarized as:

$Y_t = A_t L_t^{B}{}_1 K_t^{B}{}_2$ ---------- (3.1)

Where Y_t denotes the aggregate production of the economy (Real GDP) at time t and A_t, L_t, and K_t, denotes the amount of total factor productivity (TFP), labour stock and capital stock at time t respectively. β_1 and β_2 are the output elasticities of labour and capital, respectively. These values are constants determined by available technology. Output elasticity measures the reaction of output to a change in levels of either labour force or capital used in production, ceteris paribus.

Therefore, the above equation can be summarized as:

$Y_t = A_t LB_t^{\beta}{}_1 INV_t^{\beta}{}_2 e^{\varepsilon}{}_t$ ---------- (3.2)

Where, Y_t represents aggregate production of the economy (Real GDP) at given time t and A_t, LB_t, and INV_t, denotes the amount of total factor productivity (TFP), labour stock and capital stock at given time t respectively. In addition, $e^{\varepsilon}{}_t$ is a noise error term. In a given technology level, any increase in the amount of labour and/or capital will increase the level of output in the economy. In the equation, 'A' captures the total factor productivity (TFP) of growth in output not accounted for by increase in labour force and capital. Meanwhile, this study pursues to explore the impact of official aid inflow on the country's economy that take the share of economic growth through changes in TFP. The research take in consideration that, TFP is a function of official foreign aid inflows and other factors. Further formulated:

$A = f(AID_t, GXP_t, NEI_t\ INP_t,)$

$= AID_t^{\beta}{}_3 GXP_t^{\beta}{}_4 NEI_t^{\beta}{}_5\ InP_t^{\beta}{}_6$ ---------- (3.3)

Where, AID is Official development assistance (ODA) as a ratio of gross domestic product (RGDP) at constant prices, GXP is general government final consumption expenditure as a ratio of RGDP, NIE is trade balance that which is net import and export as a ratio of RGDP, and INP is the ratio of interest payments on external debt to RGDP.

By substituting (3.3) into (3.2), and obtain;

$Y_t = LB_t^{\beta}{}_1 INV_t^{\beta}{}_2 ODA_t^{\beta}{}_3 GXP_t^{\beta}{}_4 NEI_t^{\beta}{}_5 INP_t^{\beta}{}_6 e^{\varepsilon}{}_t$ ---------- (3.4)

Based on the Harrod-Domar model investment is the main variable that determine growth. However, including aid and investment in the same equation is going to result in bias estimation because it results in double counting since some part of investments are financed by aid. Therefore, to tackle this problem the paper consider Chenery and Strout (1966) foreign aid can supplement domestic saving which could be directed to investment. Therefore, the research consider INV_t as domestic saving (DS_t).

$INV_t = DS_t$ ---------- (3.5)

Where, DS_t is Domestic saving at a given time, therefore inserting equation 3.5 in to equation 3.4, and obtain and rearrange:-

$Y_t = TLF_t^{\beta}{}_1 DS_t^{\beta}{}_2 ODA_t^{\beta}{}_3 GXP_t^{\beta}{}_4 NEI_t^{\beta}{}_5 INP_t^{\beta}{}_6 e^{\varepsilon}{}_t$ ---------- (3.6)

From equation 3.6 and taking, the natural logs in both sides of the equation to obtain operational econometric model of growth of Ethiopia:

$\ln Y_t = \beta_0 + \beta_1 \ln TLF_t + \beta_2 \ln DS_t + \beta_3 \ln ODA_t + \beta_4 \ln GXP_t + \beta_5 \ln NEI_t + \beta_6 \ln INP_t + \varepsilon_t$ ------(3.7)

Equation 3.7 shows the long–run equilibrium (co-integration) relationship between growth in real GDP, ODA and other model variable. The nature of the model is adjusted in logarithmic form to make the analysis and interpretation of the explanatory variables easier in terms of percentage, growth rate and elasticities.

Total Labour Force (TLF), measured in this model as the total productive labour force aged (15-64) participation and is expected to lead to an increase in real GDP per capita. Thus, holding all other

factors constant, an increase in the labour force is expected to lead to increase in real GDP per capita. Hence, the coefficient of total labour force is expected to be positive ($\beta_1 > 0$)

Domestic Saving (DS) measured as gross fixed capital formation domestically is expected to have a positive impact on real GDP per capita. Thus, an increase in capital formation results in growth of real GDP per capita, holding all other factors constant. As a result, the coefficient of capital is expected to be positive ($\beta_2 > 0$).

The official development assistance (ODA) main variable of interest in the study, herein considered as official development assistance is theoretically expected to supplement domestic capital formation and expenditure hence enhance economic growth. An increase in the inflow of official AID is expected to lead to an increase in the rate of growth. Thus, coefficient of ODA is expected to be positive ($\beta_3 > 0$). The focus of the study is to test the statistical significance of ODA on economic growth.

Theoretically expected that, the flow of foreign aid to recipient country becomes effective up to some point and then its effect on economic growth declines as the flow of aid increases due to the absorptive capacity constraint. The research did not consider this parameter in econometric model instead uses other analytical method to prove for its non-existence.

General Government Final Consumption Expenditure (GXP) is expected to stimulate economic growth by increasing aggregate demand particularly in periods of recession or in a case of high unemployment like the situation in Ethiopia. Increase in government expenditure (expenditure incurred by government in its production of non-market final goods and services (except Gross Fixed Capital Formation) and market goods and services provided as social transfers in kind) is therefore growth enhancing ($\beta_4 > 0$).

Trade balance that which is net import and export (NEI) is the difference between total export and total import at this stage of Ethiopia, the value expected is negative. It can also result in currency depreciation. Therefore, the coefficient of NEI is expected to be negative ($\beta_5 < 0$).

Interest payment on external debt (INP) is expected to have adverse effect on economic growth. It can increase the budget deficit of a country and reduce public savings especially when the amount is huge. It is therefore expected that interest payments on external debt will be negatively related to economic growth ($\beta 6 < 0$).

The parameters represented as β measures the percentage (unit) change in the dependent variable following a percentage change in independent variable.

3.5.2 Method of Data Analysis and Estimation Techniques

Data processing involves data editing and classification. The collected data was edited to assure that the data are accurate, consistent with other data gathered and as complete as possible for the period of 1990 – 2018 G.C. After the data edited properly, it was arranged and presented by classifying the data based on their common characteristics (variables).

The purpose of the research paper was to emphasis in explanatory research study where examining a situation or a problem in order to explain the relationships between variables. It was also attempts to build and elaborate on theories and add to predictions and principles where possible. Accordingly, the cause and effect relationship between dependent (GDP) and Independent variables are studied. Descriptive statics has applied during analysis.

The research was used time series data, trend analysis for 30 years that was used for empirical analysis and examine the extent to which official development assistance (ODA) affects the GDP for the period of 1990 to 2019. The estimation technique is adopted based on the extent it has for the heterogeneity associated with data by allowing for individual specific variables. Stands for Variance Inflation Factor (vif), Serial Correlation and Residual Normally Distribution test identify and gives more informative data for; more variability, less collinearity among variables, uniform residual error distribution, more degree of freedom and more efficiency.

Ones the collected data is well organized in systematic manner then it is analyzed quantitatively using statistical software. The study analysis has use time series data, which data is collected at different points in time. For time series data, assumptions of conventional statistical methods and application of the common statistical characteristics are mostly disrupted. Therefore, analyzing time series data requires a unique set of tools and methods, collectively known as time series analysis. Time series data is a gathering of quantities those are assembled over intervals in time and chronologically arranged. More specially, careful seeing of time series data used as a preliminary tool for detecting if are data:

- Is mean-reverting or has explosive behavior;
- Has a time trend;
- Exhibits seasonality;
- Demonstrates structural breaks.

This, characteristic, can help and lead for the testing, diagnostics, and estimation methods used during time series modeling and analysis. Accordingly, it require stationarity test (test of the unit root on each variable), test of co-integration and heterogeneity tests were undertaken. Then vector autoregressive (VAR) and vector error correction model (VECM) are used for evaluate long run and short run dynamics relationship of economic growth and its determinants. Particularly to show the significance of official development assistance with the growth equation. All analysis and estimations were carried out using Stata 14 econometric software package. Gujarati 2008 was also used for technical reference.

3.5.3 Unit Root Test

Time series models was used for a variety of reasons like predicting future outcomes, understanding past outcomes, making policy suggestions, and much more. These general goals of time series modeling do not vary significantly from modeling cross-sectional or panel data. However, the techniques used in time series models must account for time series correlation (Time-Domain Versus Frequency Domain Models).

A stochastic process is said to be stationary if its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two time periods and not the actual time at which the covariance is computed. If a time series is not stationary in the sense just defined, it is called a nonstationary time series. In other words, a nonstationary time series will have a time varying mean or a time varying variance or both. We call a stochastic process purely random if it has zero mean, constant variance σ2, and is serially uncorrelated. (Gujarati, 2008).

The random walk model but a specific case of a more general class of stochastic processes known as integrated processes. In general, if a (nonstationary) time series has to be differenced d times to make it stationary, that time series is said to be integrated of order d. A time series Y_t integrated of order d is denoted as $Y_t \sim I(d)$. If a time series Y_t is stationary at the begin with (i.e. it does not require any differencing), it is said to be integrated of order zero, denoted by $Y_t \sim I(0)$. Most economic time series are generally I (1); that is, they generally become stationary after taking their first differences (Gujarati, 2008).

The following properties of integrated time series may be noted (Gujarati, 2008):

Let X_t , Y_t , and Z_t be three time series.

1. If $X_t \sim I(0)$ and $Y_t \sim I(1)$, then $Zt = (Xt + Yt) = I(1)$; that is, a linear combination or sum of stationary and nonstationary time series is nonstationary.

2. If $X_t \sim I(d)$, then $Z_t = (a + bX_t) = I(d)$, where a and b are constants. That is, a linear combination of an I (d) series is also I (d). Thus, if $X_t \sim I(0)$, then $Z_t = (a + bXt) \sim I(0)$.

3. If $Xt \sim I(d_1)$ and $Y_t \sim I(d_2)$, then $Z_t = (aX_t + bY_t) \sim I(d_2)$, where $d_1 < d_2$.

4. If $X_t \sim I(d)$ and $Y_t \sim I(d)$, then $Z_t = (aX_t + bY_t) \sim I(d^*)$; d^* is generally equal to d, but in some cases $d^* < d$

Missing the above properties in the study on the stationarity of variables and non-stationary may result in spurious correlation.

Unit root tests are tests for stationarity in a time series. A time series has stationarity if a shift in time does not cause a change in the shape of the distribution; unit roots are one cause for non-stationarity. These tests are known for having low statistical power. Stationarity test is done on all time series properties of data to avoid possible spurious regression result by employing the unit root test by Augmented Dickey- Fuller (ADF) and the Phillips Perron (PP) test (Gujarati, 2008).

Dickey–Fuller (DF) test, in honor of its discoverers. Interestingly, if the hypothesis that $\delta = 0$ is rejected (i.e., the time series is stationary), we can use the usual t test. Keep in mind that the Dickey–Fuller test is one-sided because the alternative hypothesis is that $\delta < 0$ (or $\rho < 1$) (Gujarati, 2008).

The DF test is estimated in three different forms, that is, under three different null hypotheses (Gujarati, 2008).

Y_t is a random walk: $\Delta Y_t = \delta Y_{t-1} + u_t$ ---------- (3.8)

Y_t is a random walk with drift: $\Delta Yt = \beta_1 + \delta Y_{t-1} + u_t$ ---------- (3.9)

Y_t is a random walk with drift around a deterministic trend: $\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + u_t$---------- (3.10)

$\delta = (\rho - 1)$, for stationarity ρ must be less than one. For this to happen δ must be negative

Where t is the time or trend variable. In each case the hypotheses are (Gujarati, 2008).:

- ✓ Null hypothesis: H_0: $\delta = 0$ (i.e., there is a unit root or the time series is nonstationary, or it has a stochastic trend).

- ✓ Alternative hypothesis: H_1: $\delta < 0$ (i.e., the time series is stationary, possibly around a deterministic trend).

In conducting DF test, it is assumed that the error term, u_t, is uncorrelated. However, in case the u, are correlated, Dickey and Fuller have developed a test, known as the Augmented Dickey-Fuller (ADF) test. This test is conducted by "augmenting" the DF three equations by adding the lagged values of the dependent variable ΔY_t. The ADF test is used in this study as most tests of the DF type have low power; that is, they tend to accept the null of unit root more frequently than is warranted.
The ADF unit root test requires the estimation of the following regression (Gujarati, 2008):

$$.\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m}(\alpha_i \Delta Y_{t-i}) + \varepsilon_t \quad \text{----------(3.11)}$$

Where; ε_t is a pure white noise error term, $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$, etc. are consecutive lagged differences augmented, β_1 is intercept, $\beta 2$ is trend coefficient, t is time or trend variable, m the number of lag terms chosen.

If the computed absolute value of the t statistic exceeds the ADF critical values, we reject the hypothesis that $\delta = 0$, in which case the time series is stationary and vice versa.
ADF test adjusts the DF test to take care of possible serial correlation in the error terms by adding the lagged difference terms of the regressand. Phillips and Perron use nonparametric statistical methods to take care of the serial correlation in the error terms without adding lagged difference terms. Since the asymptotic distribution of the PP test is the same as the ADF test statistic. The PP method estimates the non-augmented DF test equation and modifies the t-ratio of the coefficient so that serial correlation does not affect the asymptotic distribution of the test statistic. A test of unit root using the Phillips Perron approach does not require a lag length determination (Gujarati, 2008).

The test regression for the PP tests is given by the following equation (Peter C.B. Phillips (1998) :

$$\Delta Y_t = C + \alpha Y_{t-1} + \mu_t \quad \text{----------(3.12)}$$

Where μ_t is I (0) and may be heteroskedastic. The PP tests correct for any serial correlation and heteroscedasticity in the errors μ_t of the test regression by directly modifying the test statistics. These tests are known as Phillips Za and Zt tests. The Z -tests allow for a wide class of time series with heterogeneously and serially correlated errors.

3.5.4 Johansen Co-integration Test

There are two possibilities to deal with nonstationary variables in a given model after the stationarity test. One is, to make a difference of the series to obtain stationary variables and if so, then continue with the analysis. However, this is used only for the analysis of a short run relationship. If not, the second is, to test if the linear combination of the nonstationary variables is stationary by using co-integration test. If they are co-integrated, then proceed the analysis with nonstationary variables.

Two variables are co-integrated if they have a long-term, or equilibrium, relationship between them. The valuable contribution of the concepts of unit root, co-integration, etc. is to force us to find out if the regression residuals are stationary. As Granger notes, "A test for co-integration can be thought of as a pre-test to avoid 'spurious regression' situations." In the language of co-integration theory, a regression is known as a co-integrating regression and the slope parameter β is known as the co-integrating parameter. The concept of co-integration can be extended to a regression model containing k regressors. In this case, we will have k co-integrating parameters. If two variable are not co-integrated, any linear combination of them will be nonstationary and, therefore, the u_t will also be nonstationary (Gujarati, 2008).

According to Engle and Granger (1987), for X_t and Y_t both I (1) to be co integrated there should exist α such that $Y_t - \alpha X_t$ is I(0) (i.e. $Y_t - \alpha X_t$ is stationary). (X_t, Y_t) is denoted as CI (1, 1).

Johansen method of co integration applies the maximum likelihood procedure to determine the presence of co-integrating vectors in a vector autoregressive system. Johansen's methodology is given by the following vector autoregressive (VAR) of order p form:

$$Y_t = \mu + A_1 Y_{t-1} + \text{---} + A_p Y_{t-p} + \varepsilon_t \quad \text{---------- (3.13)}$$

Where Y_t is an nx1 vector of variables that are integrated of order one [I (1)], μ is a vector of constant, ε_t is an nx1 vector and A_1, A_2 ... Ap are PxP matrices of estimable parameters.

In the original work of Johansen and Juselius (1990), the model incorporates a vector of non-stochastic variables (D_t) orthogonal to the constant term such as seasonal dummies, 'dummy type' variables and/or stochastic 'weekly exogenous' variables. Thus, the model can also be given as (Gujarati, 2008):

$$Y_t = \mu + A_1 Y_{t-1} + \text{---} + A_p Y_t + \phi D_{t\,-p} + \varepsilon_t \quad \text{---------- (3.14)}$$

In general, economic time series are non-stationary processes and the above VAR model is expressed in its first differenced form given as follows (Gujarati, 2008).

$\Delta Y_t = \pi Y_{t-1} + \sum_{i=0}^{p-1}(\Upsilon \Delta Y_{t-1}) + \mu + \phi D_{t-p} + \varepsilon_t$ ---------- (3.15)

Where, $\pi = \sum_{i=1}^{p}(A_t - 1)$ and $Y_i = -\sum_{j=i+1}^{p}(A_j)$

γ and π represent short run adjustment and long run relationship among the Y. variables respectively. The rank of π shows the number of linear combinations of the Y_t, variables that are stationary.

3.5.5 Vector Error Correction Model (VECM)

If two variables are not co integrated or proved to have no long run relationship, the testing procedure will stop there and one will not go for the construction of an error correction model. However, if they are co-integrated or proved to have a long run relationship one needs to go for an error correction mechanism. The error correction mechanism (ECM) is a mechanism used to correct any short run deviation of the variables from their long run equilibrium. If two variables Y and X are co integrated, then the long term or equilibrium relationship that exists between the two can be expressed as ECM (Gujarati 2008). This means one shall go for the construction of an error correction model if and only if the two variables are co-integrated. The ECM can be given by (Gujarati 2008):

$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 u_{t-1} + \varepsilon_t$ ---------- (3.16)

Where Δ denotes the first difference operator, ε_t is a random error term, and $u_{t-1} = (Y_{t-1} - \beta_1 - \beta_2 X_{t-1})$, that is, the one-period lagged value of the error term from the co-integrating regression.

This ECM equation states that ΔY_t depends on ΔX_t and also on the equilibrium error term. If the latter [error term] is nonzero, the model is out of equilibrium. Suppose ΔX_t is zero and u_{t-1} is positive. This means Y_{t-1} is too high [above] to be in equilibrium. Since α_2 is expected to be negative, the term $\alpha_2 u_{t-1}$ is negative and, therefore, ΔY_t will be negative to restore the equilibrium. That is, if Y_t is above its equilibrium value, it will start falling in the next period to correct the equilibrium error; hence the name ECM. By the same token, if u_{t-1} is negative (i.e., Y_t is below its equilibrium value), $\alpha_2 u_{t-1}$ will be positive, which will cause ΔY_t to be positive, leading Y_t to rise in period t. The absolute value of α_2 determines how quickly the equilibrium is restored (Gujarati 2008).

3.6 Foreign Aid Absorption Capacity of Ethiopia

In this section, the research try to explore how foreign aid absorbed by the domestic economy. Foreign aid is considered as a capital transfer, is not part of measured GDP. The aid could be absorbed, by allowing increased domestic expenditure, but this is not the only option. Some part of it might be offset by a respective capital outflow, or used to collect foreign exchange reserves. Further, some of the aid flows received from donors is not correspond to international transfers: such as scholarships as technical assistances have not direct effect on the recipient's domestic expenditure. In this case, aid is not absorbed by the domestic economy. Therefore, this implies that absorption to take place, domestic expenditure must increase relative to domestic production, implying an increase in net imports.

This topic of the study interested in how absorption takes place. In addition, investigate the extent of absorption of foreign aid in Ethiopian economy. Absorption of foreign aid requires an increase in at least one of the components of domestic final expenditure: household consumption, government consumption, and gross investment. From this, we can simply see the effects of aid on the ratios of these components to real GDP. "From a national accounts viewpoint, foreign aid inflow is a capital transfer, which does not contribute directly to real GDP, however in principle allows an increase in domestic expenditure on final goods and services, relative to domestic production". Alternatively, aid can be used to accumulate foreign reserves, or lead to a capital outflow. In addition, some foreign aid has no direct effect on the aid recipient's domestic expenditure, like consultancy cost or scholarship education cost. Therefore, it is important weather foreign aid be absorbed or not?

Let consider what it means for aid to be fully absorbed. Take Y as GDP, equal to the sum of household consumption C, gross investment I, and government consumption G, minus net imports M − X. For aid to be absorbed, at least one of C, I or G must increase, along with their total. If they increase relative to GDP, the GDP identity implies that the ratio of net imports to GDP, (M − X)/Y, must also increase. Everything is good about this; it is what must happen if foreign aid allows greater domestic expenditure relative to domestic production. In the short run, if aid is devoted to higher domestic expenditure on final goods and services, net imports will rise one-for-one with aid. If the response of net imports is smaller than this, aid absorption is only partial (Journal of International Economics. 2017 Published by Elsevier B.V). Pp-432

To study absorption, we take the ratios C/Y, I/Y, G/Y and (M−X)/Y as our dependent variables. Aid absorption quite different in the short and the long run. In the short run, aid might be used to build foreign exchange reserves, which are used to finance higher expenditure only later, so that full absorption is temporarily postponed. More generally, the relationships between macroeconomic ratios and aid could be complicated over longer time horizons. If aid is spent in ways that improve the investment climate, the long-run effect of aid on investment could be much larger than the short-run effect. Alternatively, consider what happens when donor funds are spent on consultants working in the donor country: short-run absorption will be zero, but technical advice may later be reflected in economic policies and hence in macroeconomic ratios. (Journal of International Economics. 2017 Published by Elsevier B.V). Pp-432

3.6.1 Dutch disease

This concept is first forward by Chenery and Strout (1966, 1979), the capacity of foreign aid to accelerate economic growth is depending upon the absorption capacity of aid recipients. The capacity to make productive use of external resources depends on many factors such as the existing infrastructure, the available skilled labour and the institutional and administrative capacity of national and local governments. Non-consideration of the above condition during reception of foreign resource might lead to excessively high amounts of foreign aid that, raise problems of absorption capacity and result in counterproductive. Therefore, LDCs with excessive foreign aid inflow will lead a condition, which is known as “Dutch disease”, mainly operates through the spending effect.

That means when part of the additional income generated by high inflow of foreign aid and the amount is spent in country on non-traded goods and services (welfare, health, expenditure, construction, and other services); the result require an excessive demand for this type of goods and services. In addition, considering the case in LDCs that, imports cannot adequate to meet high demand and the condition create further domestic supply constraints exist. This is therefore, create rise in price of the non-tradable goods and services in relation to the price of those tradable. This appreciation of the real exchange rate is harmful to external resource affordability and economic growth. Both absorptive capacity constraints and “Dutch disease” problems affect the growth, specially, in the notion of negative returns at high levels of aid inflows.

CHAPTER FOUR

Result and Discussion

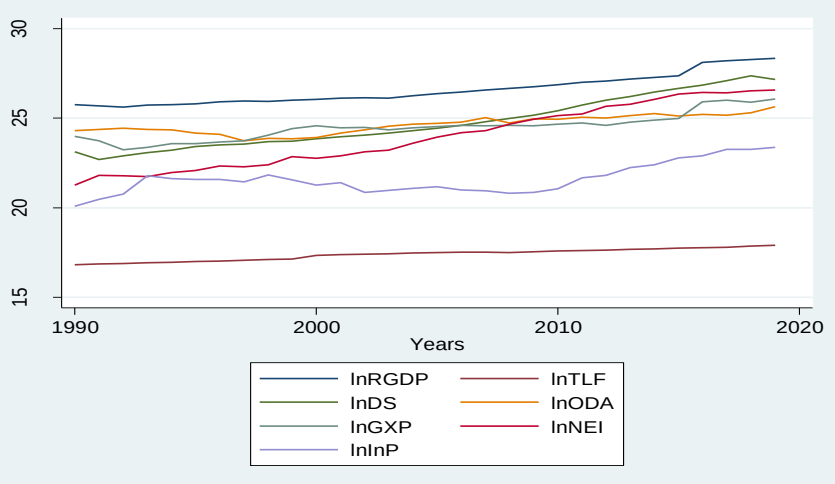
In the last chapter, the study has described and state methods of estimation, in this section the study examined the estimation methods and interpret results. Therefore, unit root test was done for all variables in the model; test for co-integration was followed to assess the long run relationship among the variables entering in growth model. Finally, after conducting different diagnostic test, vector error correction model (VERM) were used to determine the long run equation and short run dynamics, and investigate long run and short run causalities among the variables. Finally, absorption capacity of Ethiopia for external resource was rapidly evaluated at the end of the chapter.

4.1 Unit Root Test

The most basic methods for stationarity detection in visualization rely on plotting the data, or functions of it, and determining visually whether they present some known property of stationary (or non-stationary) data.

Accordingly, consider the time plot in graph - 4.1, which depicts seven series: total amount of Real Gross Domestic Income, Total Domestic Labour Force, Total Domestic Saving, General Government Final Consumption Expenditure, Trade Balance (Net Export and Import) and Total Interest Payments on External Debt of Ethiopia from 1990 to 2019. The series seem to be highly correlated, largely due to the strong trends in both regressor and regressend.

Graph 4.1-trend statistic in level values (I (0))



To perform, any meaningful regression with time series variables, it is essential to test the existence of unit roots in the variables and hence to establish their order of integration. The variables used in the analysis need to be stationary and should be co-integrated in order to deduce a meaningful relationship from the regression.

In order to avoid problems of spurious correlation normally associated with the inclusion of non-stationary series in regression models and to protect avoidance of stationary series, proper tests of stationarity on variables of interest should be performed. The most prominent tests to examine that whether the data series is stationary or not, are the conventional Augmented Dickey-Fuller test (ADF) and the Phillips-Perron test (PP). These two tests allow for options of output in conducting the tests; for this study ADF test with trend (T) and constant (C) was done separately, at 1 lag and PP test with similar pattern but at lag 3 was conducted using Stata 14 statistical software.

From the results shown in table 4.2, both the ADF and the PP class of tests show that lnRGDP, lnTLF, lnDS, lnODA, lnGXP, lnNEI1 and lnINP1 are non-stationary at level I(0). At this stage, the null hypothesis of unit root is not rejected at the 1% and 5% level of significances. Therefore, the null hypothesis for the test claims that the data series under investigation was non-stationary.

Table 4-1: The Result for the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) Unit Root Tests

At Order of Integration I(0)

Variables	Options	ADF Unit Root Test					PP Unit Root Test					Order Of Itegration
		ADF test statistic		1% critical value	5% critical value	P Value	PP test statistic		1% critical value	5% critical value	P Value	
		Test statistic	Lag length				Test statistic	Lag length				
lnRGDP												
Z(t)	With T	-0.942	1	-4.352	-3.588	0.9515	-1.108	3	-4.343	-3.584	0.9277	
Z(rho)							-2.597	3	-23.012	-18.204		I(0)
Z(t)	With C	1.717	1	-2.485	-1.708	0.9508	2.842	3	-3.723	-2.989	1.0000	
lnTLF												
Z(t)	With T	-1.678	1	-4.352	-3.588	0.7603	-1.706	3	-4.343	-3.584	0.7484	
Z(rho)							-5.821	3	-23.012	-18.204		I(0)
Z(t)	With C	-0.896	1	-2.485	-1.708	0.1893		3	-3.723	-2.989	0.8067	
lnDS												
Z(t)	With T	-1.146	1	-4.352	-3.588	0.9211	-2.865	3	-4.343	-3.584	0.1740	
Z(rho)							-7.870	3	-23.012	-18.204		I(0)
Z(t)	With C	0.512	1	-2.485	-1.708	0.6936		3	-3.723	-2.989	0.9969	
lnODA												
Z(t)	With T	-1.897	1	-4.352	-3.588	0.6563	-1.822	3	-4.343	-3.584	0.6943	
Z(rho)							-6.122	3	-23.012	-18.204		I(0)
Z(t)	With C	0.359	1	-2.485	-1.708	0.6385		3	-3.723	-2.989	0.9623	
lnGXP												
Z(t)	With T	-2.437	1	-4.352	-3.588	0.3603	-2.590	3	-4.343	-3.584	0.8352	
Z(rho)							-5.081	3	-23.012	-18.204		I(0)
Z(t)	With C	-0.052	1	-2.485	-1.708	0.4795		3	-3.723	-2.989	0.9803	
lnNEI1												
Z(t)	With T	-2.551	1	-4.352	-3.588	0.3029	-1.840	3	-4.343	-3.584	0.6853	
Z(rho)							-6.863	3	-23.012	-18.204		I(0)
Z(t)	With C	0.452	1	-2.485	-1.708	0.6722		3	-3.723	-2.989	0.6722	
lnInp1												
Z(t)	With T	-1.030	1	-4.352	-3.588	0.9399	-1.482	3	-4.343	-3.584	0.8352	
Z(rho)							-5.081	3	-23.012	-18.204		I(0)
Z(t)	With C	-0.457	1	-2.485	-1.708	0.3258		3	-3.723	-2.989	0.7639	

Considering table 4.3 after creating the first difference (I(1)) of the variables using trend, the result for dlnRGDP and dlnGXP were both in ADF and PP class of tests indicated stationarity at 1% level of significance. The variable dlnTLF and dlnNEI1 were in ADF tests indicated stationarity at 5% level of

significance and stationary also in PP class of test at 1% level of significance. The other variables dlnDS, dlnODA and dlnINP1 were non-stationary in ADF test at the 1% and 5% level of significance but they were stationary in PP test at 1% level of significance. Finally, conducting ADF test using constant term dlnRGDP, dlnTLF dlnGXP dlnNEI1 and dlnINP1 tests indicated stationarity at 1% level of significance and dlnDS and dlnODA tests indicated stationarity at the 5% level of significance. For PP test including constant term, all variables are stationary at 1% significance. As a result, the null hypothesis of unit root was rejected at 5% level of significance for ADF and at 1% significance for PP class of test when the series was differenced once(I(1)).

Therefore, the variables in their first difference suggest the presence of stationarity in ADF and PP test. The data series was said to be stationary if its error term has zero mean, constant variance, and the covariance between any two-time periods depends only on the distance or lag between the two periods and not on the actual time at which it is computed Harris, R (1995: 15).

Table 4-2: The Result for the Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) Unit Root Tests
At Order of Integration I (1)

Variables	Options	ADF Unit Root Test					PP Unit Root Test					Order Of Itegra-tion
		ADF test statistic		1% critical value	5% critical value	P Value	PP test statistic		1% critical value	5% critical value	P Value	
		Test statistic	Lag length				Test statistic	Lag length				
dlnRGDP												
Z(t)	With T	-4.587	1	-4.362	-3.592	0.0011	-5.918	3	-4.352	-3.584	0.0000	I(1)
Z(rho)							-25.825	3	-22.884	-18.204		
Z(t)	With C	-3.685	1	-2.492	-1.711	0.0006						
dlnTLF												
Z(t)	With T	-3.415	1	-4.362	-3.592	0.0495	-4.963	3	-4.352	-3.584	0.0002	I(1)
Z(rho)							-26.946	3	-22.884	-18.204		
Z(t)	With C	-3.400	1	-2.492	-1.711	0.0012						
dlnDS												
Z(t)	With T	-1.589	1	-4.362	-3.592	0.7967	-5.660	3	-4.352	-3.584	0.0000	I(1)
Z(rho)							-32.345	3	-22.884	-18.204		
Z(t)	With C	-2.042	1	-2.492	-1.711	0.0262						
dlnODA												
Z(t)	With T	-2.452	1	-4.362	-3.592	0.3521	-5.503	3	-4.352	-3.584	0.0000	I(1)
Z(rho)							-36.296	3	-22.884	-18.204		
Z(t)	With C	-2.100	1	-2.492	-1.711	0.0232						
dlnGXP												
Z(t)	With T	-4.724	1	-4.362	-3.592	0.0006	-4.630	3	-4.352	-3.584	0.0009	I(1)
Z(rho)							-22.315	3	-22.884	-18.204		
Z(t)	With C	-4.871	1	-2.492	-1.711	0.0000						
dlnNEI1												
Z(t)	With T	-4.160	1	-4.362	-3.592	0.0051	-6.352	3	-4.352	-3.584	0.0000	I(1)
Z(rho)							-34.064	3	-22.884	-18.204		
Z(t)	With C	-4.239	1	-2.492	-1.711	0.0001						
dlnInp1												
Z(t)	With T	-2.727	1	-4.362	-3.592	0.2251	-4.881	3	-4.352	-3.584	0.0003	I(1)
Z(rho)							-27.796	3	-22.884	-18.204		
Z(t)	With C	-2.678	1	-2.492	-1.711	0.0066						

Finally, the ADF and the PP tests from Table 4.3 test result shows that, all variables are integrated of the same order (order one, I (1)). Thus, the determination of co-integrating relationships does not suffer from mixed order of integration and hence co-integration analysis is rational in carrying out the specified growth model estimation in the following section.

4.2 Lag Length Selection

Studies of growth regression mostly do not emphasis on the time lags that, most probably exist in the aid-growth relationship. However, one would not expect aid to be effective in a single period. Instead, aid-financed activities has eventual impact on growth after a certain lags. The difficulty is how to allow for this time lapse econometrically. To provide for this time lapse, economists have introduced some dynamics into the non-linear effect of aid by using an autoregressive distributed lag (ADL) relation between aid and growth. "Aid and growth are each lagged once to reveal that the current growth value depends on the current and previous values of foreign aid. In other words, this relationship shows that the current value of foreign aid has an effect on the current and future values of growth".

Lag Length Selection

Before conducting of co-integration test, it is wise, to conduct and select appropriate lag length, usually the number of lags included in the VAR model affects the test. In Stata 14 software the, Log Likelihood (LL), likelihood ratio *(*LR*),* Final Prediction Error (FPE), the Akaike Information Criteria (AIC), the Schwarz Information Criteria (SIC) and the Hannan-Quinn Information Criteria (HIC) were tests that can be used to choose appropriate lag length. The optimal lag length for this study is determined by using the LR, FPE, AIC and HQIC at first difference I (1) level, accordingly, the optimal lag length used in the growth equation was two lag, which was appropriate to carry the co-integration test as tabulated in table 4.3.

Table 4.3- Lag selection of the growth model

Selection-order criteria
Sample: 1992 - 2019 Number of obs = 28

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	23.9343			0.000	7.0e-10	-1.20959	-1.10778	-0.876542
1	212.176	376.48	49	0.000	3.8e-14	-11.1554	-10.3409	-8.49104*
2*	275.56	126.77*	49	0.000	2.9e-14*	-12.1829*	-10.6556*	-7.1871

4.3 Johansen Co integration Test

In the unit root test in previous section some the variable were nonstationary at I(0) level, Which has no sense to examine econometric analysis, unless they are linearly combined in a stationary series. The test of co-integration in this section therefore, tests for existence of such a relationship among the nonstationary variables described in this study.

Referring back to table 4.2 all the variables are integrated of similar order (I (1)) in the model equation. Hence, in this section it was a stage to check for co-integration relationships among variables real GDP, active labor force, domestic saving, official development assistance, general final government expenditure, net trade balance, and interest payment on external debt using Johansen co-integration test. It was the way and tool to determine the number of co-integrating vectors. The study used two test statistics called the maximum eigenvalue (λ_{max}) and trace statistics (λ_{trace}) using Stata 14 software to compute the value.

For k-endogenous variables each with a single unit root, there is a possibility to find from zero to k-1 linearly independent co-integrating relations. Two types of test statistics were used to determine the rank of the model in this study; namely the trace test and the maximum Eigen likelihood ratio test. The trace test (λ_{trace}) tests the null hypothesis of r co-integrating vectors against the alternative hypothesis of k co-integrating vectors, where k is the number of endogenous variables, for r=0,1,2 ... ,k-1. The maximum Eigen-value test, alternatively, tests the null hypothesis of r co-integrating vectors against the alternative hypothesis of r+1 co-integrating vectors.

The hypothesis was stated as: H_0: No co-integration equation and H_1 : H_0 is not true

Note - Johansen co-integration test should be performed on the level, but not for the first difference of the variables, it is also possible to use in log transformation form.
Decision criteria:

- Rejection at 5% level
- Reject the null hypothesis if the trace and max statistics > 5% critical value, otherwise fail to reject the null hypothesis.

Table 4.4 Results of the Johansen Co integration Test for Growth Equation of the Study Model

Johansen tests for co-integration

Trend: constant Number of obs = 28

Sample: 1992 - 2019 Lags = 2

Maximum rank	parms	LL	eigenvalue	Trace statistic	5% Critical value
0	56	174.67436		201.7714	124.24
1	69	206.22916	0.89501	138.6618	94.15
2	80	225.72624	0.75158	99.6677	68.52
3	89	243.86388	0.72625	63.3924	47.21
4	96	258.22598	0.64151	34.6682	29.68
5	101	266.86818	0.46060	17.3838	15.41
6	104	272.01415	0.30759	7.0919	3.76
7	105	275.56008	0.22375		

Maximum rank	parms	LL	eigenvalue	Max statistic	5% Critical value
0	56	174.67436		63.1096	45.28
1	69	206.22916	0.89501	38.9942	39.37
2	80	225.72624	0.75158	36.2753	33.46
3	89	243.86388	0.72625	28.7242	27.07
4	96	258.22598	0.64151	17.2844	20.97
5	101	266.86818	0.46060	10.2920	14.07
6	104	272.01415	0.30759	7.0919	3.76
7	105	275.56008	0.22375		

Referring to table 4.4 above and its summary of test statistics, the trace test shows that the null hypothesis of r=0 co-integrating relation is rejected and the alternative $r \geq 0$ co-integrating equations is accepted. This means that there is six co-integrating equations because the null hypothesis of $r \leq 1$ could not be rejected in the next step. The maximum Eigen likelihood ratio test confirms almost the same result. It shows that the null hypothesis of r=0 co-integrating relation was rejected in favor of the alternative r= 1.

Accordingly, both the trace and maximal Eigen test value confirms that there is six co-integrating vector among the variables and there are six Eigen values significant at 1% and 5% level significance. From the outcome one can easily determines that the rank of the co-integration was sixth. This means among the variables real GDP, active labor force, domestic saving, official development assistance,

general final government expenditure, net trade balance, and interest payment on external debt there were six long run relationships existed.

Therefore, the variables in the study model exhibit a long-run relationship:-

1. Implies the series are related and can be combined in a linear fashion.
2. That is, even if there were shocks in the short run, which may affect movement in the individual series, they would converge with time (in the long run).
3. Hence, estimate both long run and short run models.
4. The discussion will required the use of vector auto regression (VAR) model and vector error correction model (VECM). The study was use co-integration test and VECM for discussion.

Before, proceeding to the next steps, the study was first perform very important diagnostic tests, which were shortly stated in appendix C, accordingly all the result in the diagnostic test were

4.4 Estimation of Long Run Growth Model

The existence of six co-integrating vector was statistically supported in the Johansen's co-integration test. The standardized β eigenvector (normalization was done with respect to lnRGDP) and the corresponding standardized α (feedback effect) coefficients associated with the first vector to which other co-integrating vectors span were then relevant for the interpretation of the long run structural economic relationships (refer Appendix-A). The normalized standardized β was given as follow:
The dynamic equation for growth function can be stated as follows:

Standardized β eigenvectors

lnRGDP

1.0000

Table 4.5 Long Run Equation

Co-integrating equations

Equation	Parms	chi2	P>chi2
_ce1	6	1139.009	0.0000

Identification: beta was exactly identified

Johansen normalization restriction imposed

	beta	Coef.	Std.Err.	z	P>|z|	[95% Conf.	Interval]
_ce1							
	lnRGDP	1					
	lnTLF	.3558438	.3719204	0.96	0.339	-.3731068	1.084794
	lnDS	-1.536763	.2944772	-5.22	0.000	-2.113928	-.9595981
	lnODA	-.5582618	.1538345	-3.63	0.000	-.859771	-.2567518
	lnGXP	-.2845573	.1041234	-2.73	0.006	-.4886354	-.0804792
	lnNEI	.8252756	.2163199	3.82	0.000	.4012964	1.249255
	lnINP	.4358068	.119562	3.65	0.000	.2014695	.6701441
	_cons	-3.438897					

During interpretation of the above equation, we should reverse the sign, accordingly DS, ODA and GXP have positive effect on RGDP and the coefficients are statically significant at 1% level in long run. However, TLF, NEI and INP have a negative effect on RGDP and the coefficients were statically significant at 1% level in long run. The variable group DS, ODA, and GXP group have increasing effect on RGDP on long run. In reverse, the variable TLF, NEI and INP group have asymmetric effect on RGDP.

Thus, the long run structural economic relationships was formulated from table 4.5 (Long Run Equation, where VECM was generated) was described as follow:

Standardized β eigenvectors

lnRGDP	lnTLF	lnDS	lnODA	lnGXP	lnNEI	lnInp
1.000	-0.3558435	1.536763	0.5582618	0.2845573	-0.8252756	- 0.4358068
	(0.339)	(0.000)	(0.000)	(0.006)	(0.000)	(0.000)

The parameters represented as β measures the percentage (unit) change in the dependent variable following a percentage change in independent variable. Alternatively, it measures the constant proportional or relative change in real GDP for a given absolute change in other variable.

Standardized α eigenvectors

lnRGDP	lnTLF	lnDS	lnODA	lnGXP	lnNEI	lnINP
-.2496432	.1829002	-.3894619	.329463	-.0449102	-.9715683	-1.286953

The values of α obtained from the co-integration of vector error-correction model show the speed of adjustment of the long run parameters towards the steady state and the deviation from the equilibrium. For instance, a coefficient of domestic saving (lnDS) was negative indicating that its speed of adjustment towards equilibrium. That was the speed of adjustment of lnDS adjusts itself to the long run equilibrium by 0.389 percent, similarly lnGXP was 0.045 percent, lnNEI was .972 percent and lnINP was 1.29 percent. However the a coefficients of lnTL and lnODA were positive indicating that the extent to which those variables deviate from the long run steady state path after a certain shock.

4.5 The Short Run Dynamic Modelling

After we have gotten the long run model and estimated coefficients, the subsequent step was to estimate Vector Error Correction Model (VECM), which captures both the long run and short run relationship.

The change in the variables in each lag represent variation in the short run, while the coefficients obtained for the error correction term represents the speed of adjustment towards the long run relationship. “A VECM was estimated starting with the general over parameterized model”. Then the VECM is exposed to a systematic decrease and testing process until a strong parsimonious model was obtained. In every round, all statistically insignificant regressors were dropped until further model reduction was rejected by the likelihood ratio test.

In modelling short-run dynamics, all weakly exogenous variables which were considered in the long run were entered in to the right hand side of the model by differencing once. The main reason for this was due to the fact that there will be high level of correlation between current and lagged values of a variable, which will therefore result in problems of multi-collinearity. “In addition, ECT, which was derived from the long run coefficients, enters in to the model by lagging one year. The rationality for lagging a year is to show how the time path matter to correct errors”. “According to Hendry and Juselius (2002), economic agents taking all available information at period t - 1, they rationally undertake actions at period t, which helps to minimize errors”.

“A procedure adopted for estimating the single equation Error Correction Model (ECM) is the Hendry's approach of general to specific modelling”. In this approach a large model was estimated first which includes as many explanatory variables and their lags as possible. Then all insignificant explanatory variables were continuously dropped until a parsimonious model with fewer explanatory variables but acceptable in terms of significance, economic interpretation and diagnostic validity is obtained after step- by step elimination of insignificant variables from the estimate, the parsimonious Error Correction Model (ECM) for equation is summarized in Appendix-B (Vector error-correction model).

The existence of stationarity and co-integration permits to develop the error correction model for growth. Thus, the growth equation is described as follow:

$$\Delta \text{lnRGDP} = \sum_{i=1}^{k} lnTLF + \sum_{i=0}^{k} lnDS + \sum_{i=0}^{k} lnODA + \sum_{i=0}^{k} lnGXP + \sum_{i=0}^{k} lnNEI + \sum_{i=0}^{k} lnIpd + \text{ECT}_{-1}$$

Where k represents lag length and ECT_{-1} denotes the error correction term.

Moreover, error correction term, which is formulated from table 4.10 (Long Run Equation) is described as follow:

$$\text{ECT}_{t-1} = (1.000\text{lnRGDP} + 0.3558438\text{lnTLF} - 1.536763\text{lnDS} - 0.5582618\text{lnODA} - 0.2845573\text{lnGXP} + 0.8252756\text{lnNEI} + 0.4358068\text{lnInp} - 3.438897)$$

The result of the ECT_{t-1} formulated above at different lag value using statistical software Stata 14 is briefly indicated in Appendix A (Vector error-correction model).

Referring to Appendix-A (Vector error-correction model) and using the short run coefficients ODA has short run causal effect on TLF at 5% significance in lag value two. In addition ODA has short run

casual effect on INP at 10% significance in lag value one and it has the same effect on NEI at 10% significance in lag value one and two . To investigate the direct causalities of the coefficients, the study has run Stata 14 software run using test of Linear Hypothesis after Estimation and get result from short run causality (Appendix B). It indicate that all the independent variables, Total Domestic Labour Force, Total Domestic Saving, General Government Final Consumption Expenditure, Trade Balance (Net Export and Import) and Total Interest Payments on External Debt have short run causal effect on RGDP.

In this case, we reject the null hypothesis. Thus, total labour force, domestic saving, official development assistance, general government consumption expenditure, net export import and interest payment on external debt have short run causal effect on RGDP.

The test of linear hypothesis after estimation and granger causality diagnostic test (Appendix B) indicate that all the six variables have short run shocks at lag value 1 and 2 on real GDP. The test result indicate that all the variables in the model has short run casual effect on RGDP and also have aggregate short run casual effect on RGDP.

From IRF graph (Appendix D) lnODA initially increase up to three, stable from period three to period four and begin to decline after period four to the standard deviation shock of lnRGDP. Therefore, the responsz of lnODA to standard deviation lnRGDP increase in short run and decrease in long run. Similarly, lnRGDP initially increase up to period two and then from period two start to decline up to period five then after period five it start to be stable state to the standard deviation shock of lnODA. Therefore, the response of lnRGDP to standard deviation of lnODA increase at short run and stable in long run.

At the end, to use co-integration equation one (_cel) is adjustment coefficient(speed of adjustments) from Appendix B (Vector error-correction model), first we have realized that there are six co-integration and six-error term in the model.

Therefore, from _cel value all the variable have no long run causal effect. Only NEI as long run significant effect on the other remaining variables including RGDP and its speed of adjustment is -.9715683 in long run.

4.6 Foreign Aid Absorption Capacity of Ethiopia

Even though, the topic require merely other research paper, this research prove the above claim using the data in appendix E and analogically uses the resource gap stated in literature.

If a country's additional effort ("sufficient" or "deficient") and absorptive capacity could not be measured, assessed or estimated, it could not be the basic criterion of aid. Fortunately, no exact measurement is needed, while three indictor can be used for an estimate of the absorptive capacity. The first two refer to "objective" verifiable facts, while the third one relies on rough commonsense rules of thumb, which may indicate a ranking order of magnitudes. We may first ascertain by how much a country succeeded in increasing its volume of investment during the past five or more years. If a rate of increase of investment could be realized in the past, then a slightly higher rate made possible by technical assistance can be plausibly projected for the future. We may (secondly) also ascertain whether a country succeeded in the recent past to raise its savings, notably to maintain or to widen the deviation between the average and the marginal rate of savings. A similar spread for the next five.-year period may constitute the lower limit of a possible savings effort. Judgment on the country s ability to mobilize additional taxes when incomes are rising may justify a projection above the recently realized lower limit of the country's ability to save. A changing composition of output (more industry with high marginal rates of savings) will lead in many cases to foreseeably higher savings rates for the country as a whole. Finally a judgment on a country's overall administrative and developmental organization is by no means as "arbitrary" as it may seem (Rosenstein-Rodan, 1961).

Accordingly, from Appendix E the ratio of Gross Investment (GDINV) to real GDP (GDINV/RGDP) rise from 0.222 to 0.457 in 20 years increase by double and the ratio of Gross Saving (GS) to real GDP (GS/RGDP) rise from 0.071 to 0.379 increase by fivefold. This result shows the absorption capacity of Ethiopia for external loan is sufficient according to Rosenstein-Rodan first and second conditions.

The third condition can be stated shortly as below:

The other relevant data for observation capacity was the resource gasps that have clearly stated in the literature part, which shows that:-

- The saving investment gap for the year 2005 – 2020 at average was 14.56 % percentage of GDP.

- The trade gap for the year 2005 – 2020 at average was 17.06 % percentage of GDP.
- The average budget deficit of Ethiopia from year 1993 to 2018 including the grant received is 12.10 Billion Birr in adjusted real value.

The above analytical result indicate that, foreign aid flow to Ethiopia qualifies the three resource gap hypothesis stated in the hypothesis by Rosesentein- Radan, Harrod-Domar (Chenery and Strout (1966, 1979) two-gap model) and Lance Taylor, which conclude that foreign aid flow to Ethiopia is significant.

Finally, the other constraint of the absorption capacity stated in third condition is the development of skilled labour and the institutional and administrative capacity of national and local governments. Therefore, for the case of Ethiopia the research point out:

- For technical implementation, which the country has, now in this stage has more than fifty government universities and more than twenty private collages with a total of one hundred thousand graduates in first, second and third level degrees.
- From the national budget trend of Ethiopia the country, allocate significant amount of budget for primary, secondary and tertiary roads.
- Concerning, the administrative capacity, foreign aid inflow was highly burdened on ministry of foreign aid and economic development (MOFED), which require further research paper in this regard.

4.6.1 Dutch disease

The research paper tried to realize that the Dutch disease does not yet attack Ethiopian economy; hence, the existence of high resource gaps and the accomplishment of the country budget allocation focuses highly on capital budget including power supply, road, industrial park, sugar facture etc.

CHAPTER- FIVE

Conclusion and Policy Implications

In this chapter, the study presented summary as a conclusion and policy recommendation. An effort was made to address the question that is foreign aid help for economic growth. The general trend of variables, statistical data's and econometric analysis using annual time series data from 1990 to 2019 G.C. have sensibly evaluated to reach in conclusion and recommendation. The research has also consider the importance of further research to be conducted in the research topic especially on policy issue.

5.1 Conclusion

In the research, co-integration test and VECM were employed to indicate the long run and short run relationships between official development assistance and economic growth. Johansen co-integration test result indicates the existence of long run relationship between the variables real GDP, active labor force, domestic saving, official development assistance, general final government expenditure, net trade balance, and interest payment on external debt. Accordingly, six long run liner equations exist between the variables in the model. The test result also shows that all the variables have short run shocks on real GDP. Although there will be convergence state in long run for variable real GDP, domestic saving, general government consumption expenditure, trade balance and interest payment for external debt nonetheless, they are insignificant except trade balance, which is adequate for long run equilibrium adjustment. The study also, found that, total labour force and official development assistance deviate from the long run steady state path after a certain shock. Finally, the response of ODA to standard deviation RGDP increase in short run and decrease in long run. Similarly, the response of RGDP to standard deviation of ODA increase at short run and stable in long run.

During evaluation of the objective using the econometric analysis, the result of total labour force expected sign has changed to negative and the other variable remain with their expected sign. Therefore, domestic saving, official development assistance, and general final government expenditure have positive impact on economic growth of Ethiopia in both the long run and the short run. Whiles

net tread balance has negative impact on short run, meanwhile total labour force and interest payment on external debt have negative impact on growth both in long run and in the short run.

The analysis of summary statistic implies that official development assistance has proposed to promote economic development of Ethiopia both in short run and long run. This reality was further supported by the trend data of resource gap and absorptive capacity the country, this statement was more explained, to mean, existence of absorptive capacity of Ethiopia because of the country economic constraints.

5.2 Policy Implications (Recommendation)

The following recommendations might be worth mentioning with regard to the existing relationship between official development assistance and economic development, and reasonable use for policy implications:

- From the results, foreign aid has significant effect to promote economic development of Ethiopian, both in short run and long run by filling the resource gap. Therefore, the country should plan and implement good monitory and fiscal policies.

- The trend statistics and β value of interest payment on external debt is significant in the long run and negative effect on real GDP. Therefore, the study recommends that, Ethiopia should focuses on the provision of more grants, long-term concessional loan and less focus on short-term loans.

- The analysis of the result altered the sign of β value of total labour force in to negative sign that, shows relative decrease in total labour force while percentage increase in real GDP. Therefore, the study recommends the provision of economic aid, which compromise both capital formation and skills development of labour through education. Similar, Ethiopia should focus productive and agricultural aid to facilitate labour absorption capacity.

- The analysis of summary statistic implies that official development assistance has significant effect to create short run economic shock and long run development effect. Therefore, Ethiopia

should plan and implement gradual economic structural changes to tackle the challenge of political load by donors and minimize dependency syndrome.

- Empirical evidence obtained in this study is an indication that official development assistance in flows to Ethiopia is significant, which can someway stabilize the macroeconomic environment such as high inflation rate, maximize productive budget and narrowing of the trade balance. Therefore, this require smart policy instruments.

- Compensation strategy should be devised by the study, to overcome the future burden on the economy of the country during future repayment of the principal and interest on the matured loans. Such strategy might include changing of short term and less concessional loan in to long term concessional loan, or facilitation of partial or total cancelation of matured loan, through smart dealing and negotiation with certain comments with the donors. Additional means might be request of supplementary funds/amendment funds based on previous loans in the name of the shortcoming of the previous loan during implementation or preliminary study. Therefore, the gain from this compensation mechanism should be used for implementation fast return capital formation.

- Finally, further research should be conducted in order to upgrade the capacity and capability of the central government and regional states institutions to advanced level for their skillful and timely investigation and manipulation of the micro and macroeconomic environment of the country.

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Appendix A

Vector error-correction model

```
Sample:  1993 - 2019                            Number of obs     =         27
                                                AIC               =   -38.8301
Log likelihood =  642.2064                      HQIC              =  -37.14611
Det(Sigma_ml)  = -5.16e-30                      SBIC              =  -33.16681

Equation           Parms      RMSE     R-sq      chi2     P>chi2
------------------------------------------------------------------
D_lnRGDP              16     .162112   0.6072   17.00622   0.3852
D_lnTLF               16     .032376   0.8456   60.26329   0.0000
D_lnDS                16     .094237   0.8957   94.41722   0.0000
D_lnODA               16     .195654   0.4400   8.642661   0.9274
D_lnGXP               16     .251475   0.5099   11.44294   0.7814
D_lnNEI               16     .098858   0.9231   132.0726   0.0000
D_lnInP               16     .239524   0.7738   37.61974   0.0017
------------------------------------------------------------------

------------------------------------------------------------------------------
             |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
D_lnRGDP     |
        _ce1 |
         L1. |  -.2496432    .523191    -0.48   0.633    -1.275079    .7757922
             |
      lnRGDP |
         LD. |    .146685   .5563067     0.26   0.792    -.9436562    1.237026
        L2D. |  -.3102861   .5374926    -0.58   0.564    -1.363752    .7431801
             |
       lnTLF |
         LD. |   .3630292   1.305273     0.28   0.781    -2.195259    2.921318
        L2D. |    .087774   1.343632     0.07   0.948    -2.545697    2.721245
             |
        lnDS |
         LD. |  -.2630417    1.26742    -0.21   0.836    -2.747139    2.221055
        L2D. |  -.0136673   .4723174    -0.03   0.977    -.9393924    .9120577
             |
       lnODA |
         LD. |  -.2995124   .4391878    -0.68   0.495    -1.160305      .56128
        L2D. |  -.0605462   .3485545    -0.17   0.862    -.7437004     .622608
             |
       lnGXP |
         LD. |  -.0512084    .338435    -0.15   0.880    -.7145288     .612112
        L2D. |   .2977865   .3512027     0.85   0.396    -.3905582    .9861312
             |
       lnNEI |
         LD. |   .3693482   .3659063     1.01   0.313    -.3478149    1.086511
        L2D. |   .2437928   .2947494     0.83   0.408    -.3339054    .8214911
             |
       lnInP |
         LD. |   .2508982    .202226     1.24   0.215    -.1454575     .647254
        L2D. |    .028076   .1613475     0.17   0.862    -.2881593    .3443113
```

```
             |
       _cons |  -.0557133   .1846622    -0.30   0.763    -.4176445     .306218
-------------+----------------------------------------------------------------
D_lnTLF      |
        _ce1 |
         L1. |   .1829002   .1044875     1.75   0.080    -.0218916     .387692
             |
      lnRGDP |
          LD. |  -.1076241   .1111011    -0.97   0.333    -.3253784    .1101301
         L2D. |  -.1722242   .1073437    -1.60   0.109    -.3826141    .0381657
             |
       lnTLF |
          LD. |  -.1967371   .2606788    -0.75   0.450    -.7076581    .3141839
         L2D. |  -.3357631   .2683395    -1.25   0.211     -.861699    .1901727
             |
        lnDS |
          LD. |   .0530162    .253119     0.21   0.834    -.4430879    .5491202
         L2D. |   .0491964   .0943275     0.52   0.602     -.135682    .2340749
             |
       lnODA |
          LD. |   .1107587   .0877111     1.26   0.207    -.0611519    .2826693
         L2D. |   .1427907   .0696105     2.05   0.040     .0063566    .2792248
             |
       lnGXP |
          LD. |   .0170169   .0675895     0.25   0.801    -.1154561      .14949
         L2D. |   .1171169   .0701394     1.67   0.095    -.0203538    .2545876
             |
       lnNEI |
          LD. |   .0247669   .0730759     0.34   0.735    -.1184592     .167993
         L2D. |   .0190221    .058865     0.32   0.747    -.0963512    .1343953
             |
       lnInP |
          LD. |   .0123514    .040387     0.31   0.760    -.0668056    .0915084
         L2D. |   .0019396    .032223     0.06   0.952    -.0612164    .0650956
             |
       _cons |   .0792599   .0368793     2.15   0.032     .0069779    .1515419
-------------+----------------------------------------------------------------
D_lnDS       |
        _ce1 |
         L1. |  -.3894619   .3041363    -1.28   0.200    -.9855581    .2066344
             |
      lnRGDP |
          LD. |  -.0817087   .3233869    -0.25   0.801    -.7155353    .5521179
         L2D. |   .3165645     .31245     1.01   0.311    -.2958262    .9289553
             |
       lnTLF |
          LD. |  -.3017626   .7587689    -0.40   0.691    -1.788922    1.185397
         L2D. |   .9292146   .7810674     1.19   0.234    -.6016492    2.460079
             |
        lnDS |
          LD. |  -.3982244   .7367642    -0.54   0.589    -1.842256    1.045807
         L2D. |  -.1905937    .274563    -0.69   0.488    -.7287272    .3475399
             |
       lnODA |
          LD. |  -.2653439   .2553044    -1.04   0.299    -.7657314    .2350436
         L2D. |  -.0434086   .2026183    -0.21   0.830    -.4405332     .353716
```

```
             |
       lnGXP |
         LD. |   .2847295   .1967358     1.45   0.148    -.1008655    .6703245
        L2D. |  -.0040451   .2041578    -0.02   0.984    -.4041869    .3960968
             |
       lnNEI |
         LD. |   .1830748   .2127051     0.86   0.389    -.2338195    .5999692
        L2D. |   .3334128   .1713409     1.95   0.052    -.0024092    .6692348
             |
       lnInP |
         LD. |   .1609497   .1175561     1.37   0.171    -.0694559    .3913554
        L2D. |   .0942814    .093793     1.01   0.315    -.0895495    .2781122
             |
       _cons |  -.0099548    .107346    -0.09   0.926    -.2203492    .2004396
-------------+----------------------------------------------------------------
D_lnODA      |
        _ce1 |
         L1. |    .329463   .6314413     0.52   0.602    -.9081393    1.567065
             |
      lnRGDP |
         LD. |  -.2875982   .6714089    -0.43   0.668    -1.603535    1.028339
        L2D. |   .7281432   .6487021     1.12   0.262    -.5432895    1.999576
             |
       lnTLF |
         LD. |   1.915794    1.57534     1.22   0.224    -1.171815    5.003403
        L2D. |   .7895257   1.621635     0.49   0.626    -2.388821    3.967873
             |
        lnDS |
         LD. |   .9478167   1.529654     0.62   0.536     -2.05025    3.945884
        L2D. |   .1144497   .5700418     0.20   0.841    -1.002812    1.231711
             |
       lnODA |
         LD. |   .0539032   .5300576     0.10   0.919    -.9849906    1.092797
        L2D. |   .5105169   .4206718     1.21   0.225    -.3139847    1.335019
             |
       lnGXP |
         LD. |   .0984286   .4084586     0.24   0.810    -.7021355    .8989927
        L2D. |  -.4804975    .423868    -1.13   0.257    -1.311264    .3502685
             |
       lnNEI |
         LD. |   .1428872   .4416138     0.32   0.746      -.72266    1.008434
        L2D. |   .0005636   .3557343     0.00   0.999    -.6966628      .69779
             |
       lnInP |
         LD. |  -.2063882   .2440674    -0.85   0.398    -.6847515    .2719752
        L2D. |  -.1989696    .194731    -1.02   0.307    -.5806353    .1826961
             |
       _cons |  -.1731298   .2228696    -0.78   0.437    -.6099462    .2636865
-------------+----------------------------------------------------------------
D_lnGXP      |
        _ce1 |
         L1. |  -.0449102   .8115951    -0.06   0.956    -1.635607    1.545787
             |
      lnRGDP |
         LD. |   .0788291   .8629657     0.09   0.927    -1.612553    1.770211
        L2D. |  -.7601954   .8337805    -0.91   0.362    -2.394375    .8739843
```

```
             |
       lnTLF |
         LD. |  -.4542691   2.024793    -0.22   0.822    -4.422791    3.514253
        L2D. |  -.2200766   2.084297    -0.11   0.916    -4.305224    3.865071
             |
        lnDS |
         LD. |  -.9619557   1.966073    -0.49   0.625    -4.815388    2.891477
        L2D. |   .2652445    .732678     0.36   0.717    -1.170778    1.701267
             |
       lnODA |
         LD. |  -.4167226   .6812861    -0.61   0.541    -1.752019    .9185736
        L2D. |  -.2350069   .5406919    -0.43   0.664    -1.294744    .8247298
             |
       lnGXP |
         LD. |  -.1859939   .5249942    -0.35   0.723    -1.214964    .8429757
        L2D. |   .3779079      .5448     0.69   0.488    -.6898804    1.445696
             |
       lnNEI |
         LD. |   .2598833   .5676087     0.46   0.647    -.8526093    1.372376
        L2D. |   .2233925   .4572273     0.49   0.625    -.6727566    1.119542
             |
       lnInP |
         LD. |   .3915484   .3137012     1.25   0.212    -.2232948    1.006392
        L2D. |   .0746876   .2502888     0.30   0.765    -.4158695    .5652447
             |
       _cons |   .1799547   .2864555     0.63   0.530    -.3814878    .7413972
-------------+----------------------------------------------------------------
D_lnNEI      |
        _ce1 |
         L1. |  -.9715683   .3190502    -3.05   0.002    -1.596895   -.3462415
             |
      lnRGDP |
         LD. |  -.3327617   .3392447    -0.98   0.327    -.9976691    .3321457
        L2D. |  -.1734845   .3277716    -0.53   0.597     -.815905    .4689359
             |
       lnTLF |
         LD. |  -.3003884   .7959764    -0.38   0.706    -1.860474    1.259697
        L2D. |   .4451819   .8193684     0.54   0.587    -1.160751    2.051114
             |
        lnDS |
         LD. |  -.4529662   .7728927    -0.59   0.558    -1.967808    1.061876
        L2D. |   -.350509   .2880267    -1.22   0.224    -.9150309    .2140129
             |
       lnODA |
         LD. |  -.4404588   .2678237    -1.64   0.100    -.9653837    .0844661
        L2D. |   -.366159   .2125541    -1.72   0.085    -.7827574    .0504393
             |
       lnGXP |
         LD. |   .4638062   .2063831     2.25   0.025     .0593029    .8683096
        L2D. |   .1637408    .214169     0.76   0.445    -.2560228    .5835043
             |
       lnNEI |
         LD. |   .0507866   .2231355     0.23   0.820    -.3865509    .4881241
        L2D. |   -.311179   .1797429    -1.73   0.083    -.6634686    .0411106
             |
       lnInP |
```

```
         LD. |   .2600382   .1233206     2.11   0.035     .0183342    .5017422
        L2D. |  -.1023247   .0983923    -1.04   0.298      -.29517    .0905207
             |
       _cons |   .1479484   .1126099     1.31   0.189     -.072763    .3686598
-------------+----------------------------------------------------------------
D_lnInP      |
        _ce1 |
         L1. |  -1.286953   .7730248    -1.66   0.096    -2.802054    .2281479
             |
      lnRGDP |
         LD. |   1.085721    .821954     1.32   0.187    -.5252797    2.696721
        L2D. |   .2169442   .7941558     0.27   0.785    -1.339573    1.773461
             |
       lnTLF |
         LD. |   1.868492   1.928567     0.97   0.333    -1.911429    5.648413
        L2D. |  -.3304889   1.985243    -0.17   0.868    -4.221493    3.560516
             |
        lnDS |
         LD. |  -.5718545   1.872637    -0.31   0.760    -4.242156    3.098447
        L2D. |   -1.23456   .6978581    -1.77   0.077    -2.602337    .1332168
             |
       lnODA |
         LD. |   -1.21063   .6489086    -1.87   0.062    -2.482468     .061207
        L2D. |  -.4180805    .514996    -0.81   0.417    -1.427454    .5912931
             |
       lnGXP |
         LD. |  -.2351789   .5000443    -0.47   0.638    -1.215248    .7448899
        L2D. |   -.031662   .5189088    -0.06   0.951    -1.048705    .9853806
             |
       lnNEI |
         LD. |  -.0587687   .5406336    -0.11   0.913    -1.118391    1.000854
        L2D. |   .3365349    .435498     0.77   0.440    -.5170255    1.190095
             |
       lnInP |
         LD. |   .1473012   .2987929     0.49   0.622     -.438322    .7329245
        L2D. |    .452299   .2383941     1.90   0.058    -.0149448    .9195428
             |
       _cons |   -.137209    .272842    -0.50   0.615    -.6719695    .3975514
------------------------------------------------------------------------------
---
```

Appendix B

1. Granger causality

```
vargranger
```

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
lnRGDP	lnTLF	.89561	2	0.639
lnRGDP	lnDS	.22462	2	0.894
lnRGDP	lnODA	2.8265	2	0.243
lnRGDP	lnGXP	5.7208	2	0.057
lnRGDP	lnNEI1	4.2063	2	0.122
lnRGDP	lnInp1	7.4096	2	0.025
lnRGDP	ALL	34.713	12	0.001
lnTLF	lnRGDP	5.3948	2	0.067
lnTLF	lnDS	9.5215	2	0.009
lnTLF	lnODA	3.4993	2	0.174
lnTLF	lnGXP	12.736	2	0.002
lnTLF	lnNEI1	8.328	2	0.016
lnTLF	lnInp1	1.2518	2	0.535
lnTLF	ALL	62.153	12	0.000
lnDS	lnRGDP	3.0011	2	0.223
lnDS	lnTLF	3.1266	2	0.209
lnDS	lnODA	1.9987	2	0.368
lnDS	lnGXP	4.0214	2	0.134
lnDS	lnNEI1	8.6626	2	0.013
lnDS	lnInp1	.42636	2	0.808
lnDS	ALL	53.811	12	0.000
lnODA	lnRGDP	1.244	2	0.537
lnODA	lnTLF	4.5417	2	0.103
lnODA	lnDS	.81506	2	0.665
lnODA	lnGXP	.07427	2	0.964
lnODA	lnNEI1	.27899	2	0.870
lnODA	lnInp1	1.9873	2	0.370
lnODA	ALL	43.662	12	0.000
lnGXP	lnRGDP	.36282	2	0.834
lnGXP	lnTLF	3.4004	2	0.183
lnGXP	lnDS	1.4284	2	0.490
lnGXP	lnODA	5.3105	2	0.070
lnGXP	lnNEI1	4.3647	2	0.113
lnGXP	lnInp1	10.141	2	0.006
lnGXP	ALL	46.16	12	0.000
lnNEI1	lnRGDP	14.812	2	0.001
lnNEI1	lnTLF	5.041	2	0.080
lnNEI1	lnDS	12.277	2	0.002

```
  |            lnNEI1              lnODA |  2.6955     2    0.260    |
  |            lnNEI1              lnGXP |  16.635     2    0.000    |
  |            lnNEI1             lnInp1 |  23.092     2    0.000    |
  |            lnNEI1                ALL |  89.549    12    0.000    |
  |-------------------------------------+--------------------------|
  |            lnInp1             lnRGDP |  1.5903     2    0.452    |
  |            lnInp1              lnTLF |   11.29     2    0.004    |
  |            lnInp1               lnDS |  3.3476     2    0.188    |
  |            lnInp1              lnODA |  1.1733     2    0.556    |
  |            lnInp1              lnGXP |  1.3975     2    0.497    |
  |            lnInp1             lnNEI1 |  4.3977     2    0.111    |
  |            lnInp1                ALL |  53.877    12    0.000    |
  +-------------------------------------------------------------------+
```

2. Test Linear Hypothesis after Estimation

```
. test ([lnRGDP]: L.lnTLF L2.lnTLF L.lnDS L2.lnDS L.lnODA L2.lnODA L.lnGXP
L2.lnGXP L.lnNEI1 L2.lnNEI1 L.lnInp1 L2.lnInp1)

 ( 1)  [lnRGDP]L.lnTLF  = 0
 ( 2)  [lnRGDP]L2.lnTLF = 0
 ( 3)  [lnRGDP]L.lnDS   = 0
 ( 4)  [lnRGDP]L2.lnDS  = 0
 ( 5)  [lnRGDP]L.lnODA  = 0
 ( 6)  [lnRGDP]L2.lnODA = 0
 ( 7)  [lnRGDP]L.lnGXP  = 0
 ( 8)  [lnRGDP]L2.lnGXP = 0
 ( 9)  [lnRGDP]L.lnNEI1 = 0
 (10)  [lnRGDP]L2.lnNEI1= 0
 (11)  [lnRGDP]L.lnInp1 = 0
 (12)  [lnRGDP]L2.lnInp1= 0

           chi2( 12) =   34.71
         Prob > chi2 =    0.0005
```

3. Short Run Causality

test (LD.lnRGDP L2D.lnRGDP)

(1)	[D_lnRGDP]LD.lnRGDP = 0
(2)	[D_lnTLF]LD.lnRGDP = 0
(3)	[D_lnDS]LD.lnRGDP = 0
(4)	[D_lnODA]LD.lnRGDP = 0
(5)	[D_lnGXP]LD.lnRGDP = 0

(6)	[D_lnNEI]LD.lnRGDP = 0
(7)	[D_lnInP]LD.lnRGDP = 0
(8)	[D_lnRGDP]L2D.lnRGDP= 0
(9)	[D_lnTLF]L2D.lnRGDP = 0
(10)	[D_lnDS]L2D.lnRGDP = 0
(11)	[D_lnODA]L2D.lnRGDP = 0
(12)	[D_lnGXP]L2D.lnRGDP = 0
(13)	[D_lnNEI]L2D.lnRGDP = 0
(14)	[D_lnInP]L2D.lnRGDP = 0

Constraint 1 dropped
Constraint 8 dropped

$H_{0:}$ RGDP No Short run causality with TLF, DS, ODA, GXP, NEI and INP.

chi2(12) = 34.00
Prob > chi2 = 0.0007

Appendix C

Diagnostic Tests

Variance Inflation Factor (vif)

It is a measure of the amount of multi-collinearity in a set of multiple regression variables. Mathematically, "the VIF for a regression model variable is equal to the ratio of the overall model variance to the variance of a model that includes only that single independent variable".

As a rule of thumb, a variable whose vif values are greater than 10 should not be considered and require further investigation. In this case, the entire variable could be considered as a linear combination of other independent variables. As indicated in table D1 all variable and mean value of vif were close to one at their first difference. Therefore, the variable in the growth model were not correlated at all.

Table D1-vif Test Result of Variable at Their First Difference

vif

Variable	VIF	1/VIF
dlnNEI1	1.32	0.756100
dlnTLF	1.23	0.814637
dlnDS	1.15	0.866667
dlnINP	1.12	0.891648
dlnODA	1.06	0.941608
dlnGXP	1.02	0.980319
Mean VIF	**1.15**	

Serial Correlation

It is the relationship between a given variable and a lagged version of itself over various time intervals. It measures the relationship between a variable's current values given its past values. If a variable was serially correlated, it indicates that indicate they were not be taken randomly.

Table D2 Result of Serial Correlation

veclmar

Lagrange-multiplier test

Lag	chi2	df	Prob > chi2
1	56.0466	49	0.22755
2	30.0078	49	0.98515

H0: no autocorrelation at lag order

At lag order 1 and 2, we could not reject the null hypothesis, so that the model has no autocorrelation. Therefore, the variable in the model have no serial correlation.

Residual Normally Distribution Test

Normality tests was used weather the residuals were normally distributed or not from a linear regression model. “If the residuals were not normally distributed, then the dependent variable or at least one explanatory variable might have the wrong functional form, or important variables might be missing, etc.”

Table D3 Result of Residual Normally Distribution Test

Jarque-Bera test

Equation	chi2	df	Prob > chi2
D lnRGDP	239.848	2	0.00000
D lnTLF	70.553	2	0.00000
D lnDS	48.715	2	0.00000
D lnODA	1.356	2	0.50755
D lnGXP	1.162	2	0.55944
D lnNEI	0.083	2	0.95957
D lnINP	1.777	2	0.41135
All	363.493	14	0.00000

H0: residual of this model is normally distributed at lag order (2)

Here for DlnRGDP, DlnTLF and DlnDS we have rejected the null hypothesis i.e. is the residuals were not normally distributed. However, for DlnODA, DlnGXP, DlnNEI and DlnInP we could not reject the null hypothesis i.e. is the residuals were normally distributed. Therefore, out of the seven variable four of the variable including the interest of the research paper was normally distributed. Therefore, the model residual was normally distributed.

Eigenvalue stability condition

All the eigenvalues lied inside the unit circle. VAR satisfies stability condition. Because the modulus of each eigenvalue is strictly less than one, the estimates satisfied the eigenvalues stability condition.

Table D4 Eigenvalue stability condition

Eigenvalue stability condition

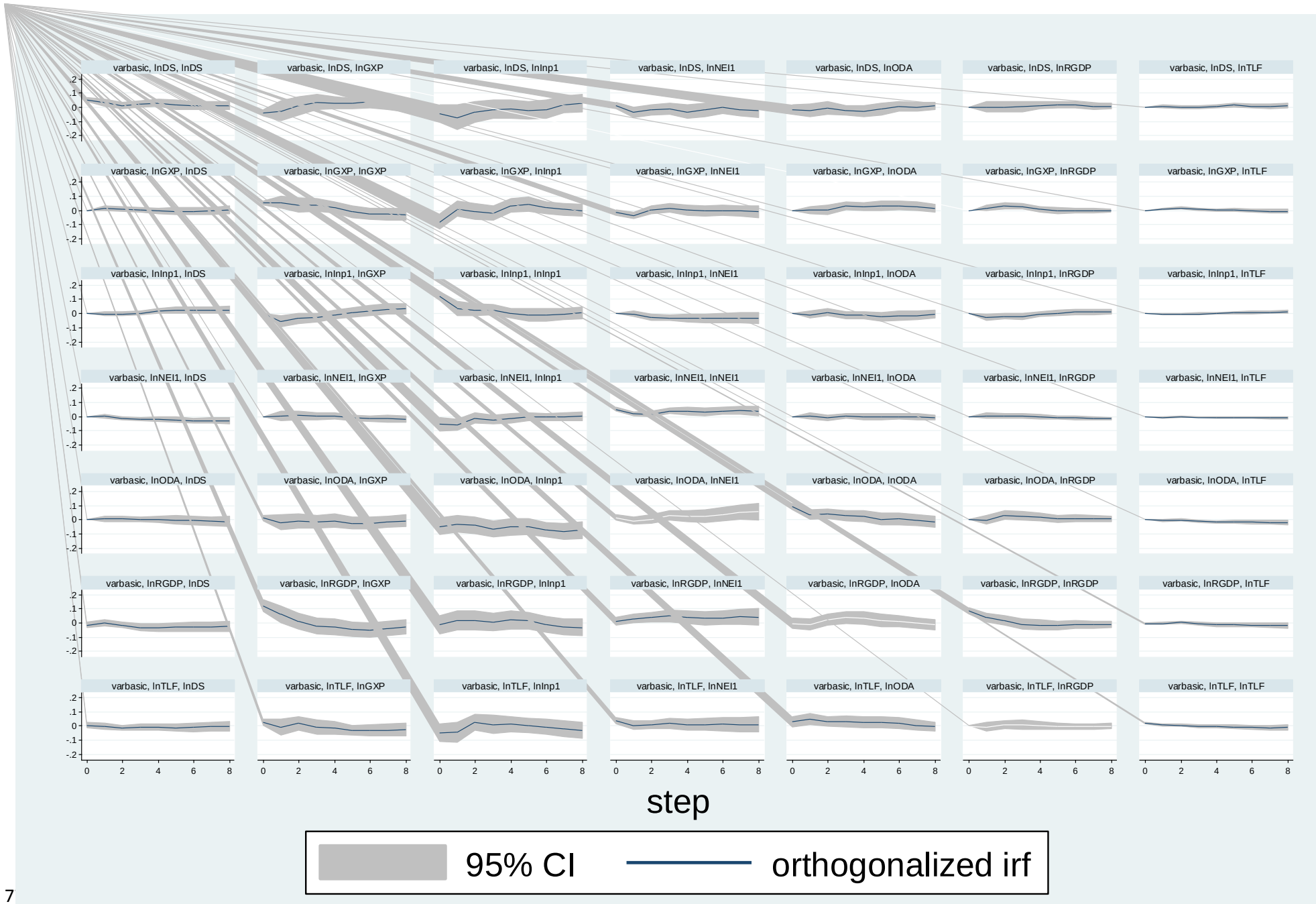
Eigenvalue	Modulus
.9529214 + .04431587i	.953951
.9529214 - .04431587i	.953951
-.9529214 + .04431587i	.953951
-.9529214 - .04431587i	.953951
-.8356968 + .3260132i	.897036
-.8356968 - .3260132i	.897036
.8356968 + .3260132i	.897036
.8356968 - .3260132i	.897036
4.059e-16 + .446819i	.446819
4.059e-16 - .446819i	.446819
-2.082e-16 + .3718945i	.371894
-2.082e-16 - .3718945i	.371894
-.2795661	.279566
.2795661	.279566

All the eigenvalues lied inside the unit circle.

VAR satisfied stability condition.

Hence, Stability condition satisfied for VAR test.

Having the above test result, we can proceed for forecasting as the VAR model has passed vif and diagnostic checking.



Graphs by irfname, impulse variable, and response variable

Appendix E: Ratio GDS/RGDP, NEI/RGDP and GDINV/RGDP

Years	RGDP	GDS	NEI	GDINV	GDS/RGDP	NEI/RGDP	GDINV/RGDP
1990	155,735,369,546.55	11,135,078,922.58	1,709,179,290.10		0.0715	0.01097489	
1991	145,275,531,293.42	7,191,138,799.02	2,983,844,185.42		0.0495	0.02053921	
1992	133,402,691,729.50	8,737,876,308.28	2,871,971,525.26		0.0655	0.02152859	
1993	151,278,652,421.25	10,517,696,117.73	2,770,166,977.18		0.06952532	0.01831168	
1994	153,848,832,592.87	12,034,666,750.42	3,445,667,080.88		0.07822397	0.02239645	
1995	162,120,033,388.39	14,950,039,855.14	3,850,580,332.59		0.09221587	0.02375142	
1996	179,335,899,164.93	16,243,225,833.93	4,990,348,357.42		0.09057431	0.02782682	
1997	187,710,800,572.20	17,173,978,580.11	4,782,876,476.11		0.09149169	0.02548003	
1998	185,003,276,069.11	19,283,865,759.93	5,391,686,368.64		0.10423527	0.02914373	
1999	196,093,907,764.77	20,128,108,876.59	8,367,900,690.86		0.10264525	0.04267293	
2000	206,585,773,564.25	23,011,366,382.89	7,761,757,397.90	45,856,649,211.63	0.11138892	0.0375716	0.221973897
2001	223,735,346,980.33	25,437,699,113.28	8,764,818,019.93	52,721,320,203.40	0.11369549	0.03917494	0.235641444
2002	227,124,302,458.27	28,348,905,027.50	11,020,177,802.03	59,956,199,182.67	0.1248167	0.04852047	0.263979673
2003	222,215,959,330.70	31,221,048,114.22	12,230,353,679.12	54,006,018,447.06	0.14049868	0.05503814	0.243033932
2004	252,375,914,087.53	35,958,476,622.16	17,764,913,219.03	73,246,747,934.20	0.14247983	0.07039068	0.290228757
2005	282,203,826,340.49	41,723,505,194.08	25,273,832,220.36	73,376,589,360.05	0.14784883	0.08955879	0.260012737
2006	312,779,566,791.37	48,120,556,961.02	32,358,784,192.29	86,278,482,822.25	0.15384815	0.10345556	0.275844371
2007	348,611,641,438.98	58,781,250,183.91	35,961,535,356.49	84,403,441,879.63	0.16861528	0.10315644	0.24211309
2008	386,221,796,713.91	70,744,887,169.71	51,267,208,513.24	94,509,280,588.15	0.18317166	0.13274033	0.244702089
2009	420,218,919,738.21	85,611,030,548.45	67,886,147,536.60	104,478,070,689.13	0.2037296	0.16154948	0.248627717
2010	472,958,679,721.40	108,357,686,739.82	83,807,362,057.09	127,745,141,598.86	0.22910603	0.17719806	0.27009789
2011	534,438,714,314.37	150,841,227,404.97	92,075,342,211.94	171,595,799,875.69	0.28224233	0.17228419	0.321076665
2012	580,655,968,672.47	196,517,676,977.26	141,187,713,708.30	215,411,608,405.29	0.33844081	0.24315209	0.370979754
2013	642,102,551,172.29	244,158,284,658.06	157,538,274,803.61	218,835,730,424.86	0.38024811	0.24534753	0.340811184
2014	708,006,207,254.19	308,937,942,633.27	206,076,356,270.30	268,914,452,726.84	0.4363492	0.29106575	0.379819343
2015	781,541,259,532.29	385,285,990,360.44	280,225,445,235.29	308,060,442,935.34	0.49298228	0.3585549	0.394170415
2016	1,627,037,242,587.20	462,002,401,931.05	303,468,142,466.12	607,678,295,063.99	0.28395318	0.18651579	0.373487637
2017	1,781,668,580,680.07	594,935,747,144.86	299,891,176,381.96	687,751,209,040.68	0.33392055	0.1683204	0.386015231
2018	1,903,003,155,363.80	768,408,668,194.81	336,276,406,593.67	764,075,520,332.00	0.40378739	0.17670828	0.40151038
2019	2,074,273,439,346.54	786,650,400,567.05	351,887,200,000.00	948,865,900,653.00	0.37924142	0.16964359	0.457444946