ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

ANALYSIS OF FOREIGN AID EFFECTIVENESS ON ECONOMIC GROWTH IN ETHIOPIA

SAMUEL ABEBAW

JULY, 2023

ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

DEPARTMENT OF ECONOMICS

ANALYSIS OF FOREIGN AID EFFECTIVENESS ON ECONOMIC GROWTH IN ETHIOPIA

A THESIS SUBMITTED TO THE DEPARTMENT OF ECONOMICS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER OF SCIENCE IN DEVELOPMENT ECONOMICS

ADVISOR: SISAY DEBEBE (PHD)

JULY, 2023

ADDIS ABABA, ETHIOPIA

DECLARATION

I, the person who signed, hereby state that this thesis is my own work that has not previously been submitted for a degree at another institution, every sources of information utilized in this thesis has been properly cited.

	Name	Signature	Date
Declared by:	_____	_____	_____

Approved by the Examining Committee:

	Name	Signature	Date
Advisor:	_____	_____	_____
Examiner (Internal):	_____	_____	_____
Examiner (External):	_____	_____	_____

ACKNOWLEDGMENT

I am grateful of the Almighty God, who created everything, gives strength and wisdom, and who lifts up when feeling broken.

Second, I want to extend my genuine and earnest appreciation and regard to my thesis advisor, Sisay Debebe (PhD), for his insightful comment, suggestion, and advice as I worked on my research.

Last but not least, I would like thank my loving family who are always there to give me courage and support to pursue my goals.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

ADF Augmented Dickey- Fuller

AFP Aggregate Production Function

AIC Akaike Information Criteria

ARDL Autoregressive Distributed Lag

DAC Development Assistance Committee

DOLS Dynamic Ordinary Least Squares Estimator

ECM Error Correction Model

FDI Foreign Direct Investment

GDP Growth Domestic Product

HIC Hannan-Quinn Information Criteria

IMF International Monetary Fund

LDCs Less Developing Countries

LL Log Likelihood

NBE National Bank of Ethiopia

ODA Official Development Assistance

OECD Organization for Economic Cooperation and Development

PP Phillips Perron

PSBR Public Sector Borrowing Requirements

SIC Schwarz Information Criteria

SSA Sub-Sahara Africa

TFP Total Factor Productivity

VAR Vector Autoregressive

VECM Vector Error Correction Model

WB World Bank

ABSTRACT

Developing countries like Ethiopia need effective transformations if they are to experience rapid economic growth and raise the standard of living for their people. On the other hand, the saving-investment gap and foreign exchange constraint makes economic growth difficult. Consequently, to bridge the resource gap, the nation looks for aid from developed nations abroad. But the impact of foreign aid on economic growth has been hotly contested. Thus, the objective of the study is to analyze the effectiveness of foreign aid on economic growth in Ethiopia. The study used 30 years of secondary time series data over the period of 1991 to 2021. To analyze the data, the study employed multivariate cointegration method of analysis. The key variables examined are real GDP growth, aid as a percentage of GDP, investment (non-aid financed), labour force, and policy index variable (a composite of budget deficit, inflation, and trade openness). The Johansen cointegration test outcome showed the presence of cointegrating vector among the target variables. The study also employed a vector error correction model (VECM) to find out the relationship between these variables in the short and long-run. According to the result from the estimated model, the impact of foreign aid on real GDP growth is statistically significant and positive in the long-run. Ceteris paribus, on average a one percent increment in foreign aid brings about 3.56 percent increase in real GDP growth. Moreover, the outcome of the study calls for better strategies to mobilize domestic saving, creating favorable macroeconomic environment so that aid can be employed to bridge the saving-investment and foreign exchange gaps and boost economic growth.

Keywords: Foreign aid, ODA, Economic Growth, VECM, Ethiopia, Aid Effectiveness

CHAPTER ONE

1. INTRODUCTION

1.1. Background of the Study

In an endeavor to overcome underdevelopment and extreme poverty, every developing country aspires to achieve economic growth and the ensuing development, which can be expressed in terms of rise in real national income, increase in life expectancy, decrease in income inequality, advancement in technology, improvement in overall living standard, etc. However, economic development cannot be achieved all of a sudden, it requires saving, investment in education and health, political stability, good governance, social inclusiveness, and vision for the future. The rising deviation in rates of saving and investment, budget deficit, and shortage of foreign exchange to import technological produces in underdeveloped nations make the pursuit economic growth difficult and pressurize them to hinge on highly on inflow of overseas capital (Tasew, 2011).

Even though saving and investment are vital for economic growth, most developing countries fail in generating sufficient capital from domestic saving and find it difficult to borrow money from abroad at the going rate of interest (Kitessa, 2012). As a result, the aspiration of developing countries to achieve economic development is impeded and official development assistance (ODA) can help in bridging the gap of saving-investment and the foreign exchange. ODA was established as the benchmark for foreign aid by the Organization for Economic Cooperation and Development (OECD) in 1969. According to the Development Assistance Committee (DAC), Official development assistance represents government aid that aims to stimulate welfare and economic development of developing countries and till these days it remains the principal source of capital in financing development projects for developing countries (OECD, 2022).

Aid has been provided from foreign countries to Ethiopia for a long time, although the amount varies from time to time. Official development assistance in Ethiopia remained very low until the overwhelming 1984 famine which resulted in sharp rise of ODA, particularly in the form of humanitarian aid. Following a regime change in the early 1990s, Ethiopia adopted World Bank

and IMF backed Structural Adjustment Program (SAP) and enjoyed a substantial amount of foreign aid. Moreover, the commitment of donors rises after the Kananaskis summit in 2002 and resulted in ODA to more than triple between 2002 and 2009 in Ethiopia. Since then, the country has received a substantial amount of foreign assistance from various sources and its importance grew due to mainly stagnant economy, rapid population growth, intermittent drought, huge balance of payment deficit, etc. (Alemayehu and Kibrom, 2011). Nonetheless, it is apparent that regardless of prominent foreign aid inflow in to the economic activities of Ethiopia, economic growth has not been up to the expectation and absolute poverty persists for several years (Belay and Girma, 2020).

There is still intense argument on the effectiveness of foreign aid in promoting economic growth in aid-recipient nations. Even though economic theories generally affirm the crucial contribution that foreign aid plays in promoting economic growth, the empirical findings remain unsettled. Lancaster (1999) contended that although foreign aid has a crucial importance in bridging the saving-investment gap for Less Developing Countries (LDCs) and plays a major role in stimulating economic progress, the general assessment of the economic activities in the Sub-Saharan Africa (SSA) evidently indicated that foreign aid did not have the desired impact and that there has been little economic progress. On the other hand, Azam and Feng (2022) examined the effect of aid on the economic growth of thirty-seven developing nations between 1985 and 2018 and found out that foreign aid boosted economic growth in general. On the contrary, Liew et al. (2012) studied the effect of aid on economic growth in nations in Eastern Africa and revealed that it had a statistically significant and negative impact.

The concomitant existence of massive foreign aid inflow and low economic growth, high unemployment, and considerable absolute poverty made the subject an area of debate among researchers. Owing to the unsettled argument surrounding the topic for most part made lots of scholars, academic community, and experts to carry out an analysis on the effectiveness foreign aid on economic growth in Ethiopia. Researchers also investigated the reasons why foreign aid became ineffective in the country and examined foreign aid inflow if it can fill the resource gap of the country needed for investment and if so to study the channel through which it can be applied.

Overall, numerous researches have been conducted to analyze the effectiveness of foreign aid on economic growth in Ethiopia and various researchers came up with diverse conclusion and policy implications.

1.2. Statement of the Problem

In economic growth process of one nation, capital accumulation remains indispensible as it finances all the needed investment. However, developing countries like Ethiopia lack adequate capital accumulation necessary to fund investment projects and foreign exchange to import capital goods and technology. Developing nations like Ethiopia are heavily dependent on the flow of aid due to their alarming budget deficits, lack of foreign currency, and the expanding divergence of saving and investment rates (Tasew, 2011).

Ethiopia, like other developing nations, has a low rate of domestic saving, making a lack of capital for development initiatives one of the challenging issues. As a result, the nation has to rely on foreign sources of funding. The effectiveness of foreign aid in promoting economic growth and the most efficient approaches to ensure that aid is valuable in accomplishing its intended goals have been strongly contested, despite the fact that it has contributed to alleviating the saving and foreign exchange bottleneck (Tasew, 2011). Even though economic theories generally affirm the crucial contribution that foreign aid plays in promoting economic growth, the empirical findings remain unsettled

A number of researchers have analyzed the effectiveness of aid on growth and discovered a positive impact of aid on economic growth. For instance, Galiani et al. (2016) and Juselius et al. (2014) observed a statistically significant and positive relationship between foreign aid and economic growth. Others have found insignificant or even statistically significant and negative relationship between aid and growth (For example, Adeyemi et al., 2014; Dreher and Langlotz, 2017). The core purpose of ODA is to enhance welfare and economic development in developing countries, yet, after massive inflows of capital to these countries, various empirical findings point out that the effectiveness of aid on growth is doubtful.

Gomannee et al. (2005) investigated the effectiveness of foreign aid on economic growth of 25 SSA countries empirically from 1970 to 1997 and indicated that foreign aid can be channeled to

investment, import financing and government spending. They also found out that foreign aid inflows have positive contributions to these countries; the average annual growth in real GDP per capita in the study period was 0.6 %. In contrast, Mallik (2008) examined the effectiveness of foreign aid in the six poorest African countries and found out a statistically significant and negative long-run outcome of foreign aid on economic growth in the five out of the six countries, the only exception was Togo. The explanation given for this negative outcome is that the majority of SSA nations are becoming increasingly reliant on foreign aid. On the surface, the outcome may seem to be evidence of the ineffectiveness of foreign aid in promoting economic growth. Yet, the findings do not entail that foreign aid is entirely useless for supporting economic progress.

Tarp (2009) contended that foreign aid is a key instrument in promoting economic growth in poor nations. The study showed that the average effect of foreign aid on economic growth is positive and emphasized a case for aid effectiveness. Hence, while it is a huge significance to infer an empirical relationship between foreign aid and economic growth, no concrete consensus has been reached among researchers on the effectiveness of foreign aid on economic growth.

The explanations for the unsettled foreign aid-economic growth relationship stays fuzzy, however numerous arguments have been made criticizing the literature on the relationship between foreign aid and economic growth. The critics include model specification, econometric approach, sample composition, and sample size. One of the most common criticisms in various studies concerns poor specification of the underlying growth model (Tasew, 2011).

Accordingly, the study tries to address unsettled enquiry of foreign aid effectiveness on economic growth in Ethiopia by employing a time series data encompassing the year 1991 to 2022. Studies on the relationship between foreign aid and economic growth are few in Ethiopia since panel regression techniques, which blend diversely characterized nations, dominate the majority of the research. Precisely, this study examines the country-specific effectiveness of foreign aid, using Ethiopia as a study area, in an effort to close gaps and add to the knowledge on the subject. The empirical researches on the impact of foreign aid on economic growth in Ethiopia have not kept up with the most recent developments in the literature on foreign aid and economic growth. A recent time series data of 30 years is used to analyze the association between foreign aid and GDP growth.

1.3. Research Questions

In line with the mentioned gap, this study revolves around seeking answers to the following basic questions:

- ✓ What are the trends in foreign aid inflows to Ethiopia's economy?
- ✓ What is the contribution of aid policy on foreign aid effectiveness?
- ✓ What is the relationship between foreign aid and economic growth in the short and long-run in Ethiopia?

1.4. Objective of the Study

1.4.1. General Objective

The main objective of this study is to analyze the effectiveness of foreign aid on economic growth in Ethiopia.

1.4.2. Specific Objectives

In particular, the research comprises and tries to emphasize on following specific objectives:

- ➢ Examine the trends in foreign aid inflows to Ethiopia's economy.
- ➢ Assess the contribution of aid policy on foreign aid effectiveness and its implication for economic growth in Ethiopia.
- ➢ Investigate the short and long-run relationship between foreign aid and impact on economic growth in Ethiopia

1.5. Significance of the Study

Studies on the relationship between foreign aid and economic growth are few in Ethiopia since panel regression techniques, which blend diversely characterized nations, dominate the majority of the research. Precisely, this study examines the country-specific effectiveness of foreign aid,

using Ethiopia as a study area, in an effort to close gaps, add to the knowledge on the subject and extending the work of other researchers.

Moreover, this study fills the missing information in the field by incorporating current developments in the literature on the relationship between foreign aid and economic growth. Its importance lies in updating the general perception of the relationship between aid and economic growth in Ethiopia. It also provides insight on concerns regarding the controversies over the varied outcomes of the empirical research on the effectiveness of aid on Ethiopia's economy. Hence, the study's implications might benefit the relevant bodies in determining the best ways to intervene in policy and thereby create a sound macroeconomic policy environment that helps in in making aid effective at stimulating growth, reducing poverty, and realizing economic development.

Additionally, for researchers with interest on studying the effectiveness of aid on growth, this study might give connotation in further investigating the required political and institutional arrangement on the operation of government. Thus, the outcome of the study could also be valuable in enhancing institutional setup, policy design, monitoring and evaluation of foreign aid.

1.6. Scope and limitations of the Study

The study analyzes the effectiveness of foreign aid on economic growth in Ethiopia using a multivariate cointegration analysis. To meet this goal, a time series data encompassing the period 1991 to 2021 is picked depending on the data availability for the study's variables. Also, other principal factors of growth in Ethiopia, elements that determine the effect of aid in promoting economic growth will also be incorporated.

The study has limitations, despite the fact that it provides some insight into how foreign aid affects economic growth in Ethiopia. Among the shortcomings is the fact that the research excludes how other types of capital inflows affect growth other than ODA. Findings of the study are also constrained by the quality of the data. The inconsistent data given by various

international and local institutions is the cause of this shortcoming. Additionally, a paucity of data made it impossible to analyze data over a lengthy period of time.

1.7. Organization of the Study

This paper will have five chapters. The first chapter is the introduction part that contains the study's background, statement of problem, objective, significance, and scope and limitations of the study. The next chapter is all about review of related literature which presents topics related to the study advanced by various writers. The third chapter deals with the methodology of the study including data type and source, method of data analysis, and model specification. The fourth chapter presents the result and discussions based on descriptive and econometric analysis. Finally, the last chapter of the paper would be the conclusion of the study and policy implications based on the findings of the study.

CHAPTER TWO

2. LITERATURE REVIEW

The aim of this section is to assess the relevant literature on the issue of how foreign aid affects economic growth. This creates a framework that directs the research. The theoretical and empirical literatures are included in this section. The theoretical literature is covered in the first section, while empirical research from Ethiopia and other nations is included in the second. Finally, gaps found in previous studies in the same area and the conceptual framework of the study is included.

2.1.Theoretical Literature

There has been a debate among various academics and researchers over the impact of aid on economic growth in developing countries. The impact foreign aid has on economic growth in LDCs is perhaps a highly contentious issue (Tasew, 2011). Considering its significance in reducing unemployment, alleviating poverty, and promoting economic growth, the effectiveness of foreign aid is an interesting topic. Regardless of huge inflow of foreign aid to LDCs, economic growth and standard of living that are presumed to be greatly influenced, inter alia, by the arrival of aid remained low. The literature about foreign aid effectiveness attempts to examine, among other things, the impact of aggregate foreign aid on economic growth.

2.1.1. Overview of Foreign Aid

Different academics come with distinct definitions of foreign aid. However, it is commonly defined as the transfer of bilateral, multilateral and concessional resources to the recipient country's government or non-governmental organization from international institutions or donor countries (OECD, 2022). The DAC adopted ODA and it is the gold standard of foreign aid since its adoption in 1969. ODA is the main source of financing for international development aid and represents government aid that aims to stimulate wellbeing and economic development of

developing countries. The DAC defined ODA as the flow of grants, loans and other flows provided by official agencies, including state and local governments, or by their executive agencies; and each transaction of which is directed towards promoting welfare and economic development in developing countries; and is concessional in character.

The reasons for the transfer of these concessional resources can be developmental, commercial, humanitarian, diplomatic, etc. Lancaster (1999) asserted that since 1980, a substantial share of foreign aid is given to countries, which are in favor of adopting agreeing to adopt political and economic reform programmes. In recipient countries, foreign aid is mostly used for financing development projects such as building infrastructure, providing training, delivering health services, and supporting family planning schemes.

2.1.2. Rationale of Foreign Aid

Foreign aid in developing countries is generally regarded as an instrument in filling the prevailing gap between saving and investment and foreign exchange constraint. It is also considered as source of financing for human resource development, building an administrative capacity, and undertaking reform programmes in developing countries (Tasew, 2011). On the other side, various literatures suggested that donor countries provide aid mainly to promote their economic or political self-interest. Certain developmental agencies might be driven by a moral duty to support others in need, such as through emergency food relief programs. However, there is not enough proof that donor nations consistently support developing countries without expecting some corresponding economic or political favor as a return. Hence, the motive of donor countries in providing aid could thus be categorized in to two general but interconnected aspects, economic and political (Todaro, 2002).

Even though donor countries have political and strategic priorities, foreign aid had a strong economic point for developing countries. Despite the fact that political motivation may have dominant significance to donor nations, the economic justification is still given lip service as the main drive for aid. Foreign aid can promote economic growth through the direct effect of stimulating Foreign Direct Investment (FDI). It is presumed by the World Bank (WB) and

International Monetary Fund (IMF) that FDI can play a significant part in reducing unemployment and eradicating poverty in developing countries.

As articulated by two-gap model developed by Chenery and Strout in 1966, investment-saving gap owing to inadequate saving and lack of foreign exchange due to import-export gap makes economic growth in underdeveloped countries difficult. The two-gap model claims that foreign aid has a significant contribution in bridging the saving-investment gap and the foreign exchange gap (Alemayehu and Kibrom, 2011). After the works of Bacha (1990), the saving-investment gap is divided in to the "private sector's investment-saving gap" and "the fiscal gap" resulting in what is known as the "the three gap model". The fiscal gap refers to a government deficit, which is a case for developing countries where government revenue is lower than government expenditure. Hence, foreign aid can be an option for financing fiscal deficit.

The two-gap analysis of foreign aid essentially associates a simple Harrod-Domar growth model with flows of foreign aid. According to the Harrod-Domar model, investment and the efficacy of it are key drivers of output growth and principal factor in promoting the economic growth of a nation. The standard neoclassical growth equation is formulated by using labour and capital, but shortage of labour supply is not a problem in LDCs. Hence, the critical constraint of LDCs in the pursuit of economic growth arise from weak domestic saving performances leading to a stumpy capital-labor ratio, inadequate capital accumulation, and slow growth of the economy. Due to this reason, developing countries search for external assistances to supplement the available domestic resource needed for higher capital formation and rapid economic growth (Kitessa, 2012).

2.1.3. Aid, Saving and Growth

Foreign aid endowment was initiated after the World War II, when the US Marshall Plan was announced in 1947 and involved the donation of funds for the rebuilding of the economic infrastructure of war-ravaged European countries. It was generally regarded as a huge achievement since numerous European nations experiencing rapid industrialization after the end of the war. On the contrary, the optimistic expectation of rapid economic growth accompanying

aid provision to LDCs during the beginning of its endowment did not happen (Kitessa, 2012). As a result, the effect of foreign aid in the economic growth of developing countries is controversial.

Early cross-country studies put emphasis on how foreign aid affected savings as well as investment based on the Harrod-Domar growth model and then its impact on economic growth indirectly. Its foundation was the idea that saving and investment go hand in hand with foreign aid in a one to one relationship. Hansen and Tarp (2001), one of the most prominent works in the area, critiqued the assertion that every dollar of funds of foreign aid would bring about an increment of exactly the same amount of saving and investment.

Studies carried out in the 1960s were driven by what is labeled as the 'gap model'. According to the basic gap model, insufficient saving and foreign exchange impede economic growth, and foreign aid is essential to fill the gap of saving so as to realize the desired economic growth rate. One of the earliest and most renowned among the gap models is the Harrod-Domar growth model. Beginning from this period, the various foreign aid effectiveness literatures attempt to examine, among other things, the effect of aggregate aid on growth. Doucouliagos and Paldam (2007) analyzed a number of literatures and indicated a clear pattern emerges in the outcome that after forty years of development assistance, the evidence point out that foreign aid has not been effective. Among the notable literatures, the 'Gap Models', along with the two methods used to study the macroeconomic effect of external finance: the 'Dutch Disease' effect of foreign aid and the 'Fiscal Response' to external finance are included.

2.1.3.1. The Gap Approach

The gap analysis of foreign aid essentially associates the flows of foreign aid with a simple Harrod-Domar growth model. The two-gap model developed by Chenery and Strout insisted that economic growth is inhibited by lack of organizational ability and skill, domestic saving gap, and limited supply of imported commodities and services. The model asserted that foreign aid has a significant contribution in bridging the saving-investment gap and so as to increase foreign exchange availability, and achieve a targeted economic growth rate (Kitessa, 2012).

The demand that exists in the economies of developing countries makes domestic saving insufficient to finance various development projects. Poor saving and capital accumulation as a

result of the inadequacy result in low level of income. Moreover, when there is no capital gain, low income gives rise to low output with little surplus for growth (Singer, 1949). Foreign aid can also relieve credit shortages faced by the governments and allow them to invest in the public infrastructure and human capital development, which will in turn promote economic growth. Aid recipient nations use resources acquired from foreign assistance to fill the saving gap and the foreign exchange gap.

2.1.3.2. The Dutch Disease Effect

The 'two gap' model is mainly criticized primarily for its failure to accommodate the impact of relative prices and led to the emergence of the 'Dutch Disease' literature. In 1986, a revised version of the two-gap model by Van Wijnbergen led to the formulation of the 'Dutch Disease' impact of foreign aid. When a massive flow of foreign aid appears to have a negative impact on the economy, the term "Dutch Disease effect" is used (Edward and Van Wijnberger, 1989). They asserted that there exist a correspondence between the inflow of foreign aid and natural resource discovery, and thus in the macroeconomic impacts of both. Dutch disease stems from when massive foreign aid flow results in the appreciation of real exchange, which leads to the creation of non-tradables sector at the expense of stagnation in tradables sector.

A growing sector generates income, and when some of this income is used to purchase non-tradeable products, the price of non-traded compared to tradables will actually increase. Resources are thereby diverted from the thriving industry and towards the non-tradeable sector. The growth impact of such a resource transfer is viewed as negative since traded sectors are characterized by dynamic externalities that will have a stronger and favorable effect on economic growth (Alemayehu and Kibrom, 2011). Since Dutch Disease decrease export earning of the recipient nation and import capacity, additional flow of foreign aid that leads to the Dutch disease effect might not be correspondingly goes hand in hand with increase in investment (White, 1998).

2.1.3.3. The Fiscal Response to External Finance

Another key feature of foreign aid inflows and its macroeconomic effect links the receiver nations' fiscal characteristics in the context of overseas capital inflow, which is the recipient nation's revenue and expenditure reaction towards foreign aid. Griffin (1970) indicated that recipient nations lean towards substituting foreign aid for domestic savings. When the majority share of foreign aid is spent to finance government expenditures, receiver nations may perhaps lessen their tax collection effort. Such kind of reaction by the receiver nations towards the flow of foreign aid will possibly generate discouraging setting in stimulating domestic saving and investment in the private sector.

As a result of increased government expenditure to make up the rise in foreign aid inflows, the loss in tax income might cause budget deficit in the recipient nations. In the end, nations that receive these funds might perhaps find it hard to avoid having to print currency and/or elevate the Public Sector Borrowing Requirements (PSBR) in order to cover their budget deficit (Kitessa, 2012). Due to the unfavorable effects of high-powered money and the surge in PSBR on interest rate, this arrangement may distress private investment. Moreover, the problem of aid fungibility may develop and may possibly crowd out private investment, and the government may change the nature of its expenditure toward inefficient consumption and/or investment.

According to World Bank (1998), the undesirable effect of foreign aid on tax efforts of the recipient nations leads to the vices of growth such as unwise policy, incompetence and rent seeking. From spending perspective, the rise in accessibility of capital aids the nation to fund its spending supposing that the reduction in tax revenue does not counterbalance the flow of foreign aid. However, the kind of spending that rises with foreign aid inflow matters and this varies from nation to nation. Numerous nations utilize the flow of foreign aid for unproductive sectors such as spending on military, remuneration of public servants and other unproductive investment (Heller, 1975). On the other hand, other governments of foreign aid recipients utilize it for funding growth initiatives such as construction of dams and irrigation schemes (Gang and Khan, 1991). This implies that the utilization of aid inflows for dissimilar spending areas has different economic growth implication in the recipient nation.

2.2. Empirical Literature

The foreign aid-economic growth relationship and its effect begin from the gap between domestic saving and investment, which becomes the focus of numerous empirical works. Researches carried out to this point on the impacts of aid on economic growth came with conflicting outcomes, some supporting the effectiveness of foreign aid on economic growth, while others disagree with this outcome. Hence, following are selected empirical studies reviewed in an organized fashion.

2.2.1. Studies Outside of Ethiopia

Panel regression techniques, which blend diversely characterized nations, dominate the majority of the research in foreign aid-economic growth literature and produced mixed outcomes. Economic theories on foreign aid such as the gap models ascribed lack of capital and foreign exchange for the slow economic growth in developing countries to. In this kind of setting, aid is regarded as an important tool for ending the misery of poverty and low economic growth. Even though economic theories generally affirm the crucial contribution that foreign aid plays in stimulating economic growth in developing countries, the empirical findings have remained contradicting.

A number of researchers have analyzed the effectiveness of aid on growth and discovered a positive impact of aid on economic growth. For instance, Galiani et al. (2016) and Juselius et al. (2014) observed a statistically significant and positive relationship between foreign aid and economic growth. Yet, others have found insignificant or even statistically significant and negative relationship between aid and growth (For example, Adeyemi et al., 2014; Dreher and Langlotz, 2017).

Burnside and Dollar (1997) investigated the link between foreign aid, GDP per capita growth, and economic policies. By employing a panel growth regression technique for 56 developing countries from the period 1970 to 1993, the authors point out that inflation, fiscal surplus, and trade openness have strong effect on economic growth. They also found out that foreign aid has a positive impact on economic growth in developing countries with sound macroeconomic and trade policies. Likewise, Durbarry et al. (1998) used panel and cross-section data methods to

estimate an Augmented Fischer-Easterly type model to examine the effect of aid on economic growth for developing nations. The outcome evidently maintains the belief that aid has positive effect on economic growth, given that there is a good macroeconomic policy setting. The authors also found out that the outcomes differ based on income level of a nation, levels of foreign aid provision and geo-economic setting.

Bhattarai (2005) investigated the effectiveness of foreign aid on economic growth and employed time-series data of Nepal from the period 1970 to 2002, and used a cointegration analysis and the error correction model. The outcome demonstrated that foreign aid has a statistically significant and positive effect on saving, investment and per capita real Gross Domestic Product (GDP) in the long run. The author point out that foreign aid promotes economic growth in good policy settings, which is described as an economy with stable macroeconomic policy, liberalized financial sector, and open to international trade. Besides, the study showed multilateral and bilateral aids are correspondingly effective in the long run. Though, grants have a compelling positive relationship with per real GDP per capita than loans in the long run.

Aruna (2021) examined the effectiveness of aid growth in South Asian countries from the period of 1996 to 2018. The research employed a Panel Fully Modified Ordinary Least Square Model to examine the link between aid and growth and point out that aid has a positive association with growth in the short run as well as in long run period. Likewise, Azam and Feng (2022) examined the effect of aid on the economic growth of thirty-seven developing nations between 1985 and 2018 and found out that foreign aid boosted economic growth in general. Taken separately, foreign aid has no effect on growth for upper middle income nations and it has a little effect in low income nations, in contrast foreign aid has a positive impact on economic growth for lower middle income countries.

On the other hand, Mallik (2008) studied the effectiveness of aid on growth from the year 1965 to 2005 by employing a multivariate cointegration analysis in the six poorest African countries, which include Malawi, Central African Republic, Mali, Sierra Leone, Niger and Togo. The variables used in the research are real GDP, investment as a share of GDP, foreign aid as percentage of GDP, and trade openness. The study employed country-specific data by using a multivariate cointegration analysis and ECM to examine the distinction between the short-run and long-run impact of foreign aid on economic growth. The empirical result, which is estimated

for each country, indicated that aid has a statistically significant and negative long run effect on growth in the five out of the six countries, the only exception was Togo. The impact of foreign aid on economic growth in Togo was positive in the study period. The effectiveness of foreign aid in Togo may possibly be related to the sound macroeconomic policy setting assuming that the six selected nations have common attributes such as low human capital development and low level of income. Foreign aid also has no significant impact on economic growth per capita in the short-run for all nations with the exception of Niger. The outcome of the study implied the long-term deleterious effect of foreign aid on economic growth and overall standard of living in these countries. Yet, some scholars argue the negative implication of foreign aid might not demonstrate the existence of foreign aid ineffectiveness in those nations but rather the limitations in the specification of the model. As Gomanee et al. (2005) suggested, incorporating foreign aid and investment into one equation will lead to biased estimation since it give rise to double counting since some of the foreign aid is used to finance investment.

Liew et al. (2012) studied the link between aid and growth in East African countries from the period 1985 to 2010 by employing panel data methods, more particularly Pooled OLS, Fixed Effects, and Random Effects to choose the model that best fits for final estimation. Based on the outcome of the regression, aid has a statistically significant and negative impact on growth for these nations. The final implication of the study calls for further studies to explore the possible channels through which foreign aid can be channeled to the economy to ensure a positive effect on growth.

Kirikkaleli et al. (2021) also examined whether foreign aid promoted growth in Chad from the year 1982 to 2018 by adopting Autoregressive Distributed Lag (ARDL) and Dynamic Ordinary Least Squares Estimator (DOLS) techniques. The result of the study indicated that foreign aid had no impact on GDP growth in the nation. On the other hand, export and import have a significant positive effect on economic growth. As mentioned by the authors, the cause behind the insignificant contribution of foreign aid is that the country used the fund for unproductive investment, which has little impact to promote growth. In addition, the research employed a wavelet coherence method so as to examine the relationship between growth and the explanatory variables. And, the result indicated that although aid and growth have a positive relationship between the periods of 1983 to 1986, there was not association among the two variables between

1990 and 2015. The empirical outcome on the effectiveness of aid on growth from various studies is summarized in Table 1.1.

Table 1.1. Empirical Findings about foreign aid effectiveness

STUDY	AID MEASURE	NON-LINEAR EFFECTS	INSTRUNMENT	"BEST CASE" ELASTICITY OF AID WRT GDP PER CAPITA	AID STATISTICALLY SIGNIFICANT
Burnside and Dollar (2000)	Total aid	Yes: Policy	External	0,24%	Yes (with good policies)
Dalgaard et al. (2004)	Total aid	Yes: Area in the tropics	Internal	0,4%	Yes (outside the tropics)
Rajan and Subramanian (2008)	Total aid	No	External	0.3%	No
Angels and Neanidis (2009)	Total aid	Yes: European settlements in the 19th century	External	0.25%	Yes (with few settlers)
Clemens et al. (2004)	Short term aid (budget support, project aid) vs long term aid (e.g., technical assistance)	Yes: Diminishing returns	Internal	2,4%	Yes (short term aid), No (long term aid)
Annen and Kosempel (2009)	Technical assistance	Yes: Donor fragmentation	External and Internal	0,2	Yes (with low fragmentation)
Minoiu and Reddy (2009)	"Developmental aid".	No	Internal	0,1	Yes (developmental), No (other)
Ouattara Strobl (2008)	Project aid, technical assistance, food aid, financial program aid	Yes: various	Internal	…	Yes, positive (project); No (Tech assistance, food aid); Yes, negative (financial program)

Source: Dalgaard, Carl-Johan (2010)

2.2.2. Studies in Ethiopia

In Ethiopia, the level of domestic saving is well below demand for investment, hence the role foreign aid plays in filling the saving-investment gap is undeniable. On the other hand, examining the overall effectiveness of foreign aid in promoting economic growth is plausible. Different researches were carried out to assess the effectiveness of aid in Ethiopia and diverse results have been observed. Below are some of the empirical literatures reviewed on the effectiveness of aid on Ethiopia's economy.

Wondwessen (2003) examined the link between foreign aid, policies and growth in Ethiopia employing Johansen maximum likelihood approach for the period of 1962/63 to 2000/01 by distinguishing investment and economic growth equation. The author indicated that foreign aid has a statistically significant impact on investment in the short run as well as in the long run. However, foreign aid is found to be unsuccessful in promoting growth in Ethiopia. Nonetheless, he pointed out that when foreign aid is supported with sound policy, the effect of foreign aid on economic growth is found to be significant. The findings of the study indicated that foreign aid is conditional on good policy setting and implied that adjusting the prevailing macroeconomic policy setting is necessary for foreign aid to be effective in enhancing growth.

Mesfin (2007) assessed the fiscal impact of foreign aid and its relationships with economic growth in Ethiopia using a vector autoregressive modeling method between the period 1960/61 to 2004/05. The outcome of study indicated that the flow of aid has a statistically significant and positive effect on economic growth in the long run. He additionally pointed out that the positive effect of aid and growth is due to its effect on government expenditure. The study also revealed that aid has a negative effect on tax revenue, yet it enhances the fiscal position.

Tasew (2011) studied the impact of foreign aid on investment and economic growth in Ethiopia by employing multivariate co-integration analysis over the period 1970 to 2009. The empirical outcome indicted that foreign aid has a statistically significant and positive impact on investment in the long-run. In contrast, volatility in the flow of foreign aid has a negative effect on domestic capital formation activity by creating uncertainty. Also, the aid policy term has a statistically significant and negative outcome on economic growth indicating that bad macroeconomic policy can restrain the effectiveness of foreign aid. The study showed as well that Ethiopia has no capacity constraint issue as to the inflow of aid.

Yohannes (2011) has investigated the effect of aid on growth in Ethiopia for the period between 1970/71 to 2008/09 and the transmission mechanisms by employing Johansen Maximum Likelihood technique. The cointegration test outcome shows the presence of long run association amongst the variables of choice in the model. In the long run, aid has a positive and statistically significant impact on economic growth through its vital role to investment and import. On the other hand, the dynamic short run model emphasize that in order foreign aid to have a positive impact on economic growth it has to be supported by sound macroeconomic policy.

2.2.3. Gaps Discovered

The goal of aid inflow to LDCs is basically developmental. In accordance with this, the subject made various scholars, researchers, writers and academicians to examine the existence of an actual relationship between foreign aid and growth. Astoundingly, many studies assessing the link between foreign aid lacks settled outcome in concluding the impact of foreign aid on economic growth is either positive or negative. Even some researchers revealed the outcome is mixed and weak or no clear association between foreign aid and economic growth. Most of the researches carried out using the poverty trap model or the two-gap model using identical data came up with diverse outcomes and recommendations. Hence, it is difficult to have a conclusive deduction on the link between foreign aid and economic growth as it rest on many aspects such as the country specific dependence of foreign aid, the presence of flawless model for estimation.

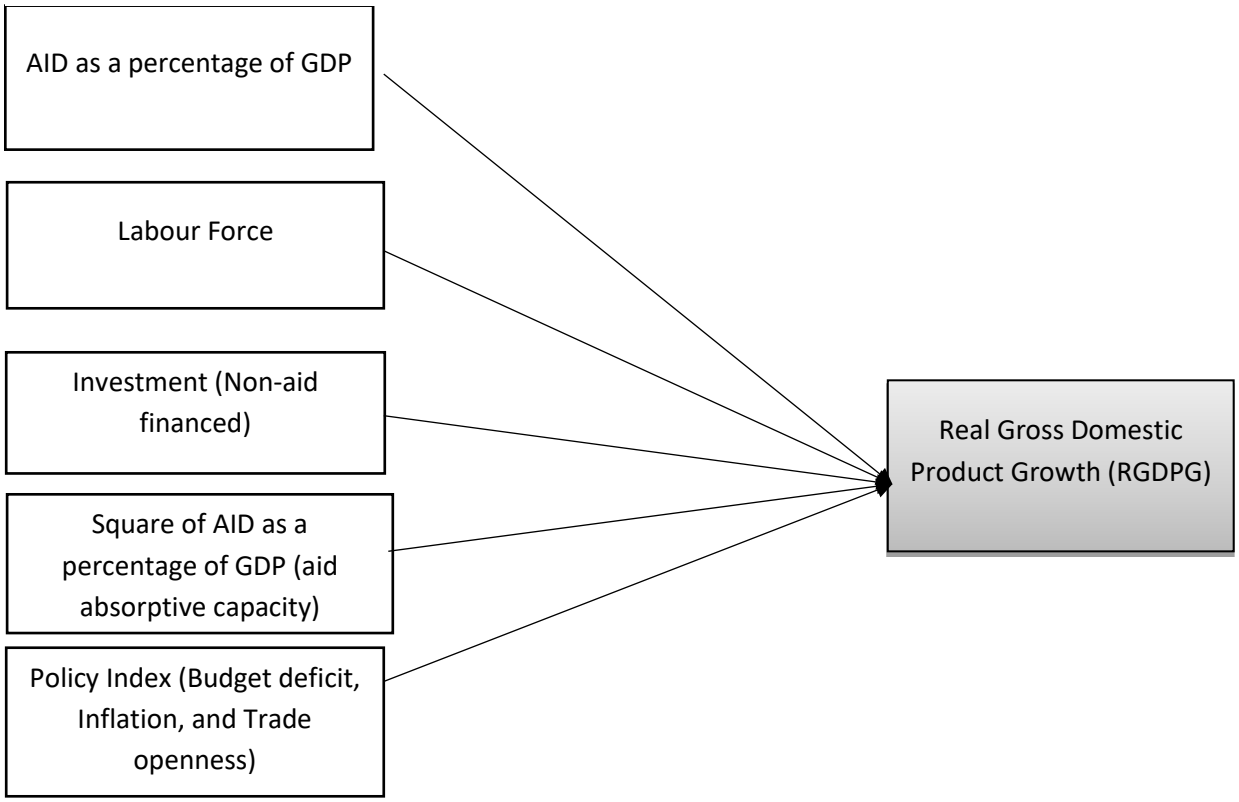
For instance, Mallik (2008) concluded the long-term deleterious effect of foreign aid on economic growth and overall standard of living after studying the effectiveness of foreign aid on economic growth from the period 1965 to 2005 using a cointegration analysis in the six poorest African countries, which include Malawi, Central African Republic, Mali, Sierra Leone, Niger and Togo. Yet, some scholars argue the negative implication of foreign aid might not demonstrate the existence of foreign aid ineffectiveness in those nations but rather the limitations in the specification of the model. As Gomanee et al. (2005) suggested, incorporating foreign aid and investment into one equation will lead to biased estimation since it give rise to double counting since some of the foreign aid is used to finance investment.

2.3. Conceptual Framework of the Study

Foreign aid is considered as an exogenous net increase to the capital stock of the recipient nation. As economic growth theories suggest, a rise in capital stock would bring about an improvement in growth by supplementing the resource needed for investment. If foreign aid is employed to bridge the saving bottleneck, then rate of saving rises and result in greater investment, which in turn bring about a rapid economic growth.

In addition to conventional inputs of capital and labour used in constructing neoclassical production function, unconventional inputs such as foreign aid, the degree of trade openness, inflation, and budget deficit could possibly be incorporated in the model to account for their role in promoting economic growth (Burnside and Dollar, 1997). Openness to trade, budget surplus and inflation would be used to construct the policy index. The conceptual framework of the study is presented below in Figure 2.1.

Figure 2.1. Conceptual framework of the study



CHAPTER THREE

3. RESEARCH METHODOLOGY

This section comprises a suitable model selected to study the effectiveness of aid on economic growth in Ethiopia, hence the aid-growth model is identified, and a concise variables' working definition and the expected sign is indicated. In addition, research design, data type and method of data analysis for the study are presented. At the end, the estimation methods used for the study and ethical consideration is included.

3.1. Research Design

So as to meet the main aim of analyzing the effectiveness of foreign aid on economic growth in Ethiopia, the study employs a quantitative analysis approach. The main goal of the study is to analyze the effectiveness of aid on economic growth in Ethiopia due to the complexity of analyzing the effectiveness of aid in all economic development factors in one study. The equation identified on the foundation of the theoretical propositions helps to analyze the effectiveness of aid on economic growth in Ethiopia. It also provides a logical and valid representation of the factors affecting economic growth and gives an explanation of contribution of aid in enhancing economic growth. A Quantitative approach is employed to determine the magnitude of the effect of the flow of aid on real GDP growth in Ethiopia during the past three decades.

3.2. Data Type and Sources

An econometric analysis of studies ultimately rests on data accessibility and accurateness. Hence, it is crucial to illustrate the nature and source of data. This paper employed a secondary time series data of Ethiopia during the past three decades, covering the year 1991 to 2021. The time series data that is used for estimation is collected from publications of National Bank of Ethiopia (NBE), statistical database of WB, IMF and database of OECD.

3.3. Method of Data Analysis

The data collected from the above sources is analyzed quantitatively. Both descriptive and econometric method of analysis is employed in the study to analyze the effectiveness of foreign aid on economic growth in Ethiopia.

3.3.1. Descriptive Statistics

The data from sources is presented and analyzed by using descriptive statistics. It is summarized using charts, tables, histograms, scatter plots, line plots and graphs. This helps to get a general view of the data and the distribution of the variables by diagrams and basic statistics such as mean and standard deviation. Thus, descriptive statistics in this study provide basic information about variables in the dataset and highlight potential relationships between variables.

3.3.2. Econometrics Model Specifications

The study have gone through the analysis of the time series property of the data via testing of the unit root on each variable, test of cointegration is carried out to examine the existence of cointegrating vectors among the variables of choice. VECM is employed to determine the short and long-run variations in the real GDP growth equation. Using advanced econometric tools, estimates of the variables are computed. In this study, Stata 15 is used for econometric analysis.

Various studies were carried out so as to get a picture of the effectiveness of aid on growth in underdeveloped nations. Various factors and analysis techniques have been employed for investigation. Many researches have examined the impact of aid on various aspects of the economy, including investment and saving. Other studies centered on the impact of aid on growth.

The standard Aggregate Production Function (APF) model has been widely employed in analyzing the effectiveness of foreign aid on economic growth in various nations. The APF model presumes that, in addition to conventional inputs of capital and labour used in

constructing neoclassical production function, unconventional inputs such as foreign aid and the degree of trade openness could possibly be incorporated in the model to account for their role in promoting economic growth.

The production technology and the input variables that affect aggregate output is expressed in terms of equation as follows:

$$Y_t = A_t LAB_t^{\beta_1} INV_t^{\beta_2} e^{\varepsilon t} \text{ - } (3.1)$$

Where, Y_t stands for real GDP (aggregate output). A_t, LAB_t, and INV_t, respectively stands for Total Factor Productivity (TFP), labour force and investment respectively. ε_t is white noise error term. Supposing constant technology, any increment in capital, labour, or both causes the increment of aggregate outpout. The term 'A' accounts for the TFP of growth in aggregate output, which is not captured by the increment in capital and labour. As the paper pursues to examine the effectiveness of foreign aid flows through variations in TFP, it is presumed the 'A' term accounts for aid along with additional determinants.

$$A_t = f(AID_t, SQAID_t, AP_t) \text{ - - - - - - - - - - - } (3.2)$$

AID stands for aid as a percentage of GDP and SQAID stands for Square of aid as a percentage of GDP, and AP stands for the aid interacted with policy (Policy Index).

$$A_t = AID_t^{\beta 3} SQAID_t^{\beta 4} AP_t^{\beta 5} \text{ - - - - - - - - - - - } (3.3)$$

Switching (3.2) into (3.1) provides:

$$Y_t = LAB_t^{\beta 1} INV_t^{\beta 2} AID_t^{\beta 3} SQAID_t^{\beta 4} AP_t^{\beta 5} e^{\varepsilon t} \text{ - - - - - - - - } (3.4)$$

Investment has been recognized as one of the key variables that accounts for growth in the Harrod-Domar model. However, incorporating foreign aid and capital accumulation into one equation will lead to biased estimation since it give rise to double counting since some of the foreign aid is used to finance investment (Gomanee et al., 2005). Thus, so as to address this problem, this study covers the amount of investment that is not funded by foreign aid.

Part of investment not included in foreign aid can be established by finding out the total sum of grants and loans allocated for spending of the nation or the residual regressor method. The first

can be done by getting government investment and adding it to the capital accumulation of the private sector which gives investment not funded by foreign aid. The doubt is, however, this approach ignores a portion of recurring spending of the investment by the government. The residual regressor approach, the other mechanism, involves regressing investment on a foreign aid. At the end, a portion of investment not funded by foreign aid is generated using the residual from the regression outcome.

Thus, a portion of investment that is not funded by foreign aid is obtained as follows. The total investment equation can be expressed as:

$$INV = \delta_0 + \delta_l AID \text{ -(3.5)}$$

The level of non-aid funded investment (INV_{NA}) is hence expressed below:

$$INV_{NA} = INV - 0.96AID \text{ -(3.6)}$$

INV stands for total level of investment, and INV_{NA} stands for level of investment not financed by aid.

Besides foreign aid used in constructing real GDP growth equation, other inputs such as policy variable could possibly be incorporated in the model to account for their role in promoting economic growth (Burnside and Dollar, 1997). Openness to trade, budget surplus and inflation would be used to construct the policy index. Hence, the real GDP growth equation is composed of openness to trade, inflation and budget deficit which represent respectively trade, monetary and fiscal policies.

Therefore, aid interacted with policy variable is constructed from residual regressor approach and its equation form is;

$$AP_t = 0.66\ BD_t - 0.07\ INF_t + 0.13\ OPEN_t \text{ - - - - - - - - - - - -(3.7)}$$

Where, AP_t stands for aid policy, BD stands for budget deficit, INF stands for rate of inflation and OPEN stands for trade openness.

The specified growth equation for Ethiopia's economy can be expressed econometrically as follows:

$$Y_t = \beta_0 + \beta_1 \ln LAB_t + \beta_2 INV_{NAt} + \beta_3 AID_t + \beta_4 SQAID_t + \beta_5 AP_t + \varepsilon_t \text{ - - - - - -(3.8)}$$

The specified growth equation is represented in the above structure to make the interpretation and analysis of the variable of choices easier with regard to rate of growth, percentage and elasticity.

3.3.2.1. Unit Root Tests

Multiple techniques have been devised by various studies to enable non-stationary variables to become stationary. It has been asserted that incorporating trend variables in the regression removes the trend component and causes a variable with deterministic trend to become stationary. Because the deviance from the trend is stationary, this process is known as trend stationary. However, stochastic trend is a feature of the majority of time series data. In this situation, pre-testing the variables for the presence of unit root is necessary so as to avoid the issue associated with erroneous regression (Gujarati, 2004).

The stationarity characteristics of variables is important as it holds key attribute, hence it is crucial to test for stationarity. This is due to performing analysis on non-stationary variables may result in false relationship. In economic analysis, a stationary time series is preferable to a non-stationary, because it enables the study of the attributes of the variables over the long run (Gujarati, 2004). By employing Augmented Dickey- Fuller (ADF) and the Phillips Perron (PP) test, stationarity tests are conducted on time series properties of the data to prevent the possibility of erroneous regression results.

The estimate of the subsequent regression needs to be performed for the ADF unit root test:

$$\Delta Y_t = \beta_0 + \beta_1 t + \delta Y_{t-1} + \sum_{i=1}^{m} (\alpha \Delta Y_{t-1}) + \varepsilon_t \text{ - - - - - - (3.9)}$$

Where, ε_t is a pure white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$ is consecutive lagged differences augmented, t is trend variable, β_0 is intercept, β_1 is a trend coefficient, m represent lags.

The hypothesis can be expressed as:

H_0: $\delta = 0$, existence of a unit root

H_1: $\delta < 0$, absence of unit root

A test of unit root utilizing the PP technique does not need a determination of lag length. Phillips and Perron developed a non-parametric way of accounting for serial correlation in unit root tests.

The estimate of the subsequent regression needs to be performed for the PP unit root test:

$$\Delta Y_t = c + \alpha Y_{t-1} + \mu_t \text{ - - - - - - (3.10)}$$

μ_t is I(0) and could also be heteroskedastic. By simply changing the test statistics, the PP tests adjust for any serial correlation and hetroskedasticity in the errors μ_t of the test regression.

3.3.2.2. Johansen Cointegration Tests

After the stationarity test, there are two techniques to handle non-stationary variables in a specific model. The first method is to compare the series to determine whether or not the variables are stationary, and if they are, move on to the analysis. This approach is only used to analyze short-term relationships. The second method involves performing a cointegration test to determine if the linear combination of the nonstationary variables is stationary. It is possible to continue the analysis using nonstationary variables if they are cointegrated.

To find out whether cointegrating vectors are present in a vector autoregressive system, the Johansen technique of cointegration uses the maximum likelihood method. The following vector autoregressive (VAR) of order p form provides Johansen's approach.

$$Y_t = \mu + A_1 Y_{t-1} \text{ - - + } A_p Y_{t-p} + \varepsilon_t \text{ - - - - - - - - - - - - - - - - - (3.11)}$$

Y_t represent an n x 1 variables' vector which are integrated of order one [I(1)] , μ is a constants' vector, ε_t is an n x 1 vector and A_1, A_2 ,..., A_p represent P x P matrices of parameters, which can be estimated.

3.3.2.3. Vector Error Correction Model

The vector error correction model (VECM), which is a method that addresses any short-run deviation of the variables from their long-run equilibrium. If two variables are not cointegrated or proved to have no long-run relationship, the testing process cease, and VECM cannot be used.

It follows that one should only proceed with developing of an ECM only if two variables, X and Y, are cointegrated. ECM enables one to convey the long-term or equilibrium relation that exists between variables (Gujarati 2004).

The model is represented as:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta X_t + \alpha_2 \mu_{t-i} + \varepsilon_t \text{ - - - - - - - - - - - - - - - - - - } (3.12)$$

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

3.3.3. Definition of Variables, measurement, and hypothesis

The APF model supposes that, in addition to conventional inputs of capital and labour used in constructing neoclassical production function, unconventional inputs such as foreign aid, the degree of trade openness, inflation, and budget deficit could possibly be incorporated in the model to account for their role in promoting economic growth. Latest developments in the literature on foreign aid and economic growth have focused on trade openness, inflation, budget deficit, aid as a share of GDP, and investment as a percentage of GDP, as conceivable factors determining economic growth. In line with the economic theory of growth enhancing contribution of aid, the data analysis method is modeled in APF framework.

Real GDP growth, which is a proxy for economic growth, is the dependent variable. The explanatory variables are labour force, investment (non-aid financed), aid as a percentage of GDP, square of aid as a percentage of GDP and policy index.

The specified growth equation for Ethiopia's economy can be expressed econometrically as follows:

$$Y_t = \beta_0 + \beta_1 \ln LAB_t + \beta_2 INV_{NAt} + \beta_3 AID_t + \beta_4 SQAID_t + \beta_5 AP_t + \varepsilon_t$$

Based on the theoretical perspective on the area of the study, the following intuitive sign for each independent variable is made:

Labour Force (LAB): Increment in labour force is indicates the number of labour force with the age interval of (15 - 64) and is anticipated to affect real GDP growth positively, in accordance with the economic theories. Ceteris paribus, as labour force increase, level of output also increases. Thus, the effect labour force is anticipated to be positive ($\beta_1 > 0$).

Non-aid Financed Investment (INV_{NA}): Investment is assumed to bring a positive effect on economic growth, based on theoretical grounds. In the study, the investment level that is not financed by foreign aid is used and it is anticipated that the coefficient of INV_{NA} to be positive ($\beta_2>0$).

AID as a percentage GDP (AID): Likewise, the share of aid in GDP is in general likely to bring a positive impact on economic growth, as it is viewed that the flow of aid supplements domestic resource. Thus an increase in aid is assumed to enhance economic growth. Thus, effect of AID is expected to be positive ($\beta_3>0$).

Square of AID as a percentage of GDP (SQAID): The flows of foreign aid will effective up to a certain level, before its impact slowly decreases when the inflow of aid rises because of the economy's capacity to absorb (Feeny and McGillivray, 2008). So as to examine the absorbtive capacity of Ethiopia's economy, squared aid is incorporated in the growth model. The coefficient of this variable is expected to be negatively related to growth of real GDP ($\beta_4<0$).

Policy Index (AP): Finally, aid policy accounts for whether or not foreign aid is affected by the current trade, fiscal, and monetary policies. The policy index is composed of trade openness, budget deficit, and inflation (Burnside and Dollar, 1997). Aid policy is anticipated to impact real GDP growth positively ($\beta_5>0$).

3.4. Ethical considerations

To avoid infringement of intellectual property, the sources used in this study are properly credited when they are used, and the researcher has studied the cited materials independently without depending on another researcher's interpretation of the sources. Additionally, all of

the data used in the study and associated findings are real and not made up. For examination and validation of the findings, the original data can be provided.

CHAPTER FOUR

4. RESULT AND DISCUSSION

This section addresses the estimation and interpretation of findings based on the previously discussed methods of estimation. Following the trend analysis, the test of cointegration is conducted to assess the long-term relationship among the variables entering the growth model after the test of unit root is done for all variables in the model. An empirical relationship between foreign aid and economic growth is also established.

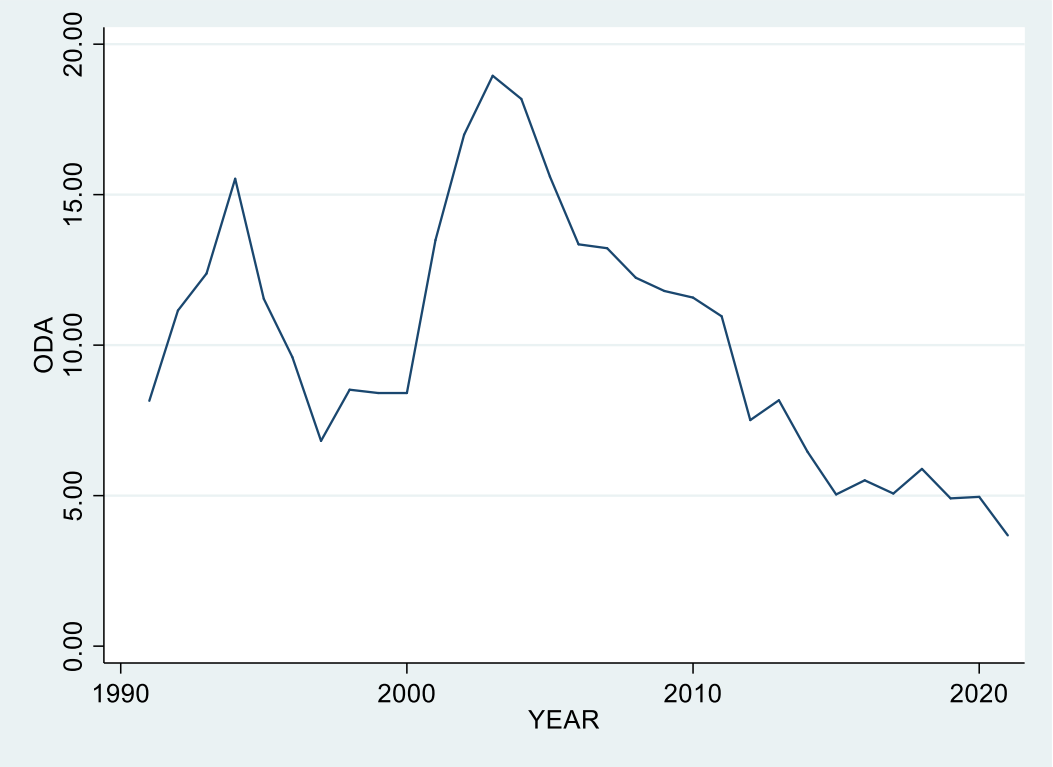
4.1. Descriptive Analysis

4.1.1. Foreign Aid Flow to Ethiopia

Although the amount varies from time to time, Ethiopia has a long history of receiving aid from donor nations. Before the devastating famine of 1984, which led to a large increase in ODA, notably in the form of humanitarian aid, foreign aid to Ethiopia remained very low. Ethiopia embraced the SAP supported by the WB and IMF after a political change in the early 1990s and benefited from substantial aid. In addition, after the Kananaskis summit in 2002, donors became more committed, which caused ODA to more than triple between 2002 and 2009 in Ethiopia. Since then, the country has been one of the major recipients of foreign aid from various sources.

ODA has been provided by both bilateral and multilateral donors and can take the form of grants, concessional loans, and humanitarian aid. The nation has received around 45% from bilateral donors and the rest is from multilateral donors (Furtado and Smith, 2007). The major bilateral donors were United States, United Kingdom, Germany, Japan, Canada, Italy, Holland, and Norway. Meanwhile, the leading providers of multilateral aid were the International Development Association, United Nations organizations, European Union, and the African Development Bank. A summary of ODA flows to Ethiopia over the year 1991 to 2021 is presented in the figure below. ODA is expressed in terms of its share (percentage) of GDP of the country.

Figure 4.1. The flow of ODA to Ethiopia



Source: OECD, 2023

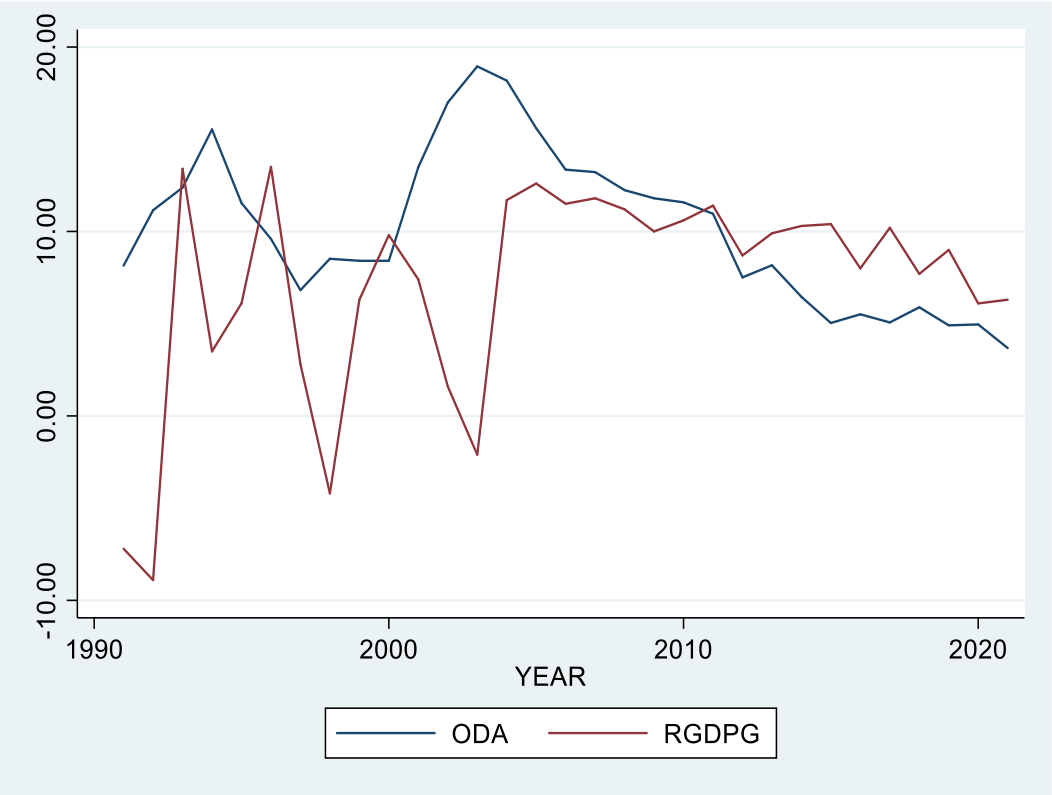
As shown in the figure, the share of ODA as a percentage GDP was the smallest (3.68) in the year 2021. And, the share of ODA as a percentage GDP was the highest (18.95) in the year 2003; this may be attributed to the commitment of donors rising after the Kananaskis summit in 2002. In addition, the mean of ODA is 10.13 with a standard deviation of 4.21 over the study period. Even though the share of ODA as a percentage GDP declined after 2003, the amount (in real terms) of ODA is still increasing.

4.1.2. The Relationship between ODA and Real GDP Growth

ODA is considered as an exogenous net increase to the recipient country's capital stock. In accordance with theories of economic growth, a rise in capital stock can enhance growth by providing additional resources for investment. If foreign aid is employed to bridge the saving-investment gap, then the rate of saving increases and results in higher investment. This greater

investment rate would in turn bring about a faster economic growth. Aid may also promote economic growth through the promotion of FDI, which in turn helps eradicate poverty and reduce unemployment in developing nations. The graph below gives a clear image of the two variables across the research period, making it easier to understand how foreign aid affects real GDP growth.

Figure 4.2. The relationship between ODA and real GDP growth



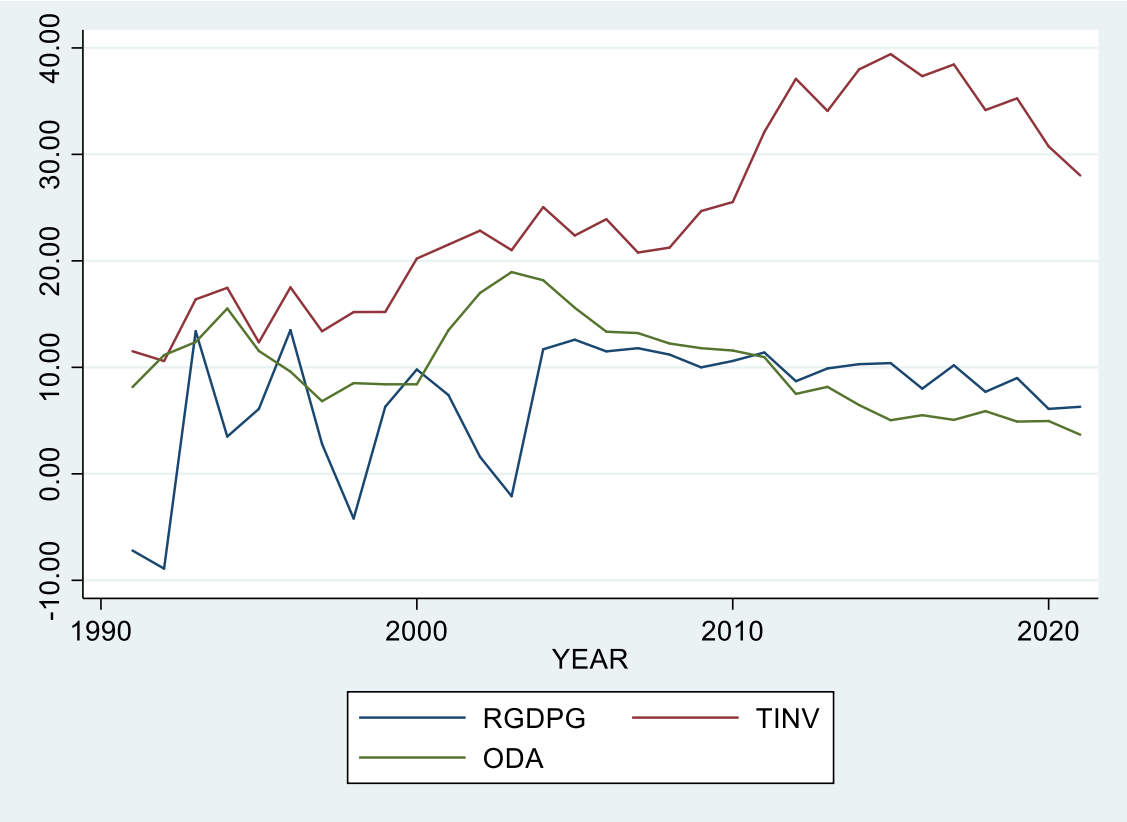
Source: OECD and IMF data, 2023

Real GDP growth was at its lowest (-8.90) in the year 1992, this is due to the border conflict between the Eritrean and Ethiopian government which results in the worsening in the nation's economic growth. And, real GDP growth was at its highest (13.5) in the year 1996. In addition, the mean real GDP growth over study period is 7.08 with a standard deviation of 5.83. Both ODA and real GDP growth highly fluctuated until the year 2005 and became stable afterwards.

4.1.3. Aid, Investment and Growth

The data indicates a consistent relationship between aid, total investment, and real GDP growth up until 2005, when ODA dramatically decreased as a result of donors' reactions to the 2005 election. Up until 2004, growth and investment appeared to increase at the same time as ODA. The ODA to GDP ratio has been on a downward trend since 2005, and it appears that this is also true of economic growth and investment levels. However, despite the tendency, there doesn't seem to be a strong connection between episodes of surge and fall in investment (and growth) and a corresponding rise and fall in the ODA to GDP ratio - although the trend does. We can therefore conclude that ODA, though having no substantial effect, was assisting in closing the financing gap.

Figure 4.3. The relationship between aid, investment and growth



Source: OECD and IMF data, 2023 Note: TINV represents Total Investment

4.2. Econometrics Result Analysis

4.2.1. Unit Root Test

The stationarity characteristics of variables is important as it holds key attribute, hence it is crucial to test for stationarity. This is due to performing analysis on non-stationary variables may result in invalid inferences. In economic analysis, a stationary time series is preferable to a non-stationary, because it enables the study of the attributes of the variables over the long run (Gujarati, 2004). Therefore, the primary step in the analysis of a time series data is to do a unit root test on the relevant variables. Test for cointegration will follow to find out the presence of cointegrating vectors among the variables of choice. Lastly, the dynamic short and long-run equation is estimated.

Before performing any proper regression using time series data, it is required to find out whether the variables used in the analysis have unit roots. To reliably infer relationship from the regression outcome, the variables must be stationary and cointegrated. The standard Augmented Dickey-Fuller test (ADF) and the Phillips-Perron test (PP) are performed to test that whether the data series is stationary or not. The test's null hypothesis is that the data series under consideration has a unit root. Conversely, the alternative hypothesis is that the data series has no unit root. The result of the unit root test for the variables of choice is summarized in Table 4.1.

Table 4.1. Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) Unit Root Tests

Variables	Specification	ADF Unit Root Test					PP Unit Root Test					
		ADF test statistic		1% critical value	5% critical value	P - value	Specification	PP test statistic	1% critical value	5% critical value	P - value	Order of integration
		test statistic	Lag length									
RGDPG	Without T and D	-4.427	0	-3.716	-2.986	0.0003*	Without T	-4.479	-3.716	-2.986	0.0002*	I(0)

	With T	-4.529	0	-4.334	-3.580	0.0014*	With T	-4.518	-4.334	-3.580	0.0014*	I(0)
	With D	-4.427	0	-2.467	-1.701	0.0001*						
dlnLAB	Without T and D	-5.015	0	-3.723	-2.989	0.0000*	Without T	-5.017	-3.723	-2.989	0.0000*	I(1)
	With T	-4.868	0	-4.343	-3.584	0.0004*	With T	-4.867	-4.343	-3.584	0.0004*	I(1)
	With D	-5.015	0	-2.473	-1.703	0.0000*						
$dINV_{NA}$	Without T and D	-6.119	0	-3.723	-2.989	0.0000*	Without T	-6.073	-3.723	-2.989	0.0000*	I(1)
	With T	-6.012	0	-4.343	-3.584	0.0000*	With T	-5.975	-4.343	-3.584	0.0000*	I(1)
	With D	-6.119	0	-2.473	-1.703	0.0000*						
dODA	Without T and D	-4.117	0	-3.723	-2.989	0.0009*	Without T	-4.096	-3.723	-2.989	0.0010*	I(1)
	With T	-4.098	0	-4.343	-3.584	0.0063*	With T	-4.083	-4.343	-3.584	0.0067*	I(1)
	With D	-4.117	0	-2.473	-1.703	0.0002*						
dSQODA	Without T and D	-3.733	0	-3.723	-2.989	0.0037*	Without T	-3.734	-3.723	-2.989	0.0037*	I(1)
	With T	-3.674	0	-4.343	-3.584	0.0241*	With T	-3.680	-4.343	-3.584	0.0237*	I(1)
	With D	-3.067	0	-2.485	-1.708	0.0026*						
dAP	Without T and D	-5.982	0	-3.723	-2.989	0.0000*	Without T	-6.107	-3.723	-2.989	0.0000*	I(1)
	With T	-5.964	0	-4.343	-3.584	0.0000*	With T	-6.085	-4.343	-3.584	0.0000*	I(1)
	With D	-5.982	0	-2.473	-1.703	0.0000*						

Source: Model Result, Author's own computation, 2023

Note: T represents trend term and D represents drift term. *represents rejection of the null hypothesis of the data series has a unit root.

4.2.2. Optimal Lag Length Selection

Prior to performing a Cointegration test, a test of choosing an optimal lag length is required since the Cointegration test's results depend on how many lags are included in the VAR (Vector Autoregressive) model. There are various tests that can be used to determine the optimal lag length, such as Akaike Information Criteria (AIC), the Log Likelihood (LL), the Hannan-Quinn Information Criteria (HIC) and the Schwarz Information Criteria (SIC). The Akaike Information Criteria (AIC), which has been shown to be superior to other tests in most empirical research, is used in this study to determine the optimal lag length. The VAR estimate with the lowest absolute value of AIC is the most efficient one, according to the Akaike Information Criteria test. Hence, the optimal lag length to be used in the growth equation is 2 and is suitable to undertake the cointegration test.

Table 4.2. Optimal Lag length Selection Criteria

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-408.503				104748	28.5864	28.675	28.8693
1	-218.084	380.84	36	0.000	2.63242	17.9369	18.557	19.9171*
2*	-165.665	104.84*	36	0.000	1.20732*	16.8045*	17.9563*	20.482

Source: Model Result, Author's own computation, 2023

Note: *represents the optimal lag length

4.2.3. Johansen Cointegration Test

Economic theories state that nonstationary variables cannot be genuinely analyzed using econometrics, but it can be done if the nonstationary variables' linear combination produces a stationary series. The cointegration test attempts to find out if the variables of the study have a cointegrating vector.

In this study, Johansen cointegration test is employed to test the number of cointegrating relationships among the variables of choice, which include real GDP growth, labor force, investment (non-aid financed), aid, square of aid and aid interacted policy index. There is a possibility to find from zero to k-1 linearly independent cointegrating relations for k-endogenous variables, each having a single unit root. Maximum eigenvalue (λ_{max}) and trace statistics (λ_{trace}) can be employed to find out the number of cointegrating vectors. In this study, the trace statistics test is employed to determine the rank of the model specified.

The outcome of the trace statistics tests indicated the null hypothesis of no cointegrating equation is rejected and ensure the presence of long-run relationship among the variables of choice. The test showed there is a maximum rank of two cointegration equations among the variables, which are real GDP growth, labor force, investment (non-aid financed), aid, square of aid and aid interacted policy index. The Johansen test for cointegration is presented in Table 4.3.

Table 4.3. Johansen tests for cointegration

Johansen tests for cointegration					
Maximum rank	**parms**	**LL**	**eigenvalue**	**Trace statistics**	**5% critical value**
0	42	-244.5377	.	157.7451	94.15
1	53	-206.27634	0.92855	81.2224	68.52
2	62	-186.93268	0.73659	42.5351*	47.21
3	69	-172.33007	0.63471	13.3299	29.68
4	74	-167.81362	0.26764	4.2970	15.41
5	77	-165.95919	0.12005	0.5881	3.76
6	78	-165.66513	0.02008		

Source: Model Result, Author's own computation, 2023

Note: *represents rejection of the null hypothesis of no cointegrating equation at the 5% and the associated r represents the maximum number of cointegating vectors.

4.2.4. The Short-run Dynamic Model

While the change in the variables shows variation in the short run, the coefficients generated from the ECM indicate the speed of adjustment towards the long run. Beginning with the general over parameterized model, a VECM was estimated, then it went thro ugh a logical reducing and testing procedure until a reliable parsimonious model is generated at last. All statistically insignificant regressors were eliminated at each stage until the likelihood rati o test refused further model reduction.

All weakly exogenous variables that are taken into account in the long run come into the right hand side of the equation by differencing once since there might be a high level of correlation between current and lagged values of a variable. Multicollinearity will become a problem as a result of this. The error correction term, which is derived from the long-run coefficients, enters the model by lagging one year. The purpose of lagging the error correction term by a year is to demonstrate how the time path is significant to correct errors. Economic agents behave rationally by acting at period t based on the information they have at period t-1, which will help to minimize errors. (Hendry and Juselius, 2002).

The general to specific modeling method developed by Hendry is used to estimate the single equation ECM. In order to develop a parsimonious model with acceptable significance diagnostic validity, a model first needs to be estimated that includes many explanatory variables and their lag. Then, all explanatory variables that are not significant are gradually eliminated. The table below presents the details of the short-run dynamic growth equation.

Table 4.4. Estimated short-run coefficients using VECM

Variables	Coefficient	Standard Error	Z	P value
RGDPG LD.	0.2111139	0.1315799	1.60	0.109
lnLAB LD.	324.8825	257.4704	1.26	0.207
INV_{NA} LD.	-0.5361286	0.242651	-2.21	0.027*
AID LD.	0.0472466	1.54151	0.03	0.976
SQAID LD.	-0.072515	0.0577928	-1.25	0.210
AP LD.	0.9828812	0.4448932	2.21	0.027*
_ce1 LD.	-1.484767	0.2038859	-7.28	0.000*

_cons	-32.97325	8.834498	-3.73	0.000*

Source: Model Result, Author's own computation, 2023

Note: *represent statistically significant at 5%.

The short-run growth equation is specified as:

$$\Delta RGDPG_t = -32.97 + 0.21\Delta RGDPG_{t-1} + 324.88\ \Delta lnLAB_{t-1} - 0.54\ \Delta INV_{NAt-1}$$

$$+ 0.05\ \Delta AID_{t-1} - 0.07\ \Delta SQAID_{t-1} + 0.98\ \Delta\ AP_{t-1} - 1.48ECT_{t-1}$$

The outcome indicates that the short-run change in real GDP growth is affected positively by the one period lagged real GDP growth, labour force, aid, and aid interacted with policy variable. On the other hand, the short-run change in real GDP growth is affected negatively by one period lagged non-aid financed investment and square of aid. Besides, the effect of one period lagged non-aid financed investment on the short-run change in real GDP growth is statistically significant and negative. The short-run equation suggest that one period lagged aid will have a negative effect on the short-run change in real GDP growth of the country, but it is statistically insignificant.

The effect of one period lagged aid interacted with policy variable on the short-run change in real GDP growth is positive and statistically significant. The finding support the claim made by Burnside and Dollar (1997) that macroeconomic policy plays a signifi cant role in determining the effectiveness of aid. This highlights the possibility that the receiving country's policies have a significant influence on the success of foreign aid and emphasizes the role that policies play in fostering economic growth by effectively allocating limited resources. The findings also coincide with Wondwossen (2003) in the case of Ethiopia.

Goodness of fit of the model (R-sq) indicates 79.4 percent of a variation in the dependent variable is explained by the combined effects of all the explanatory variables in the short-run. Thus, the overall fit of the model is good. The Durbin Watson statistics (1.85) result also implies that there is no problem of autocorrelation. Moreover, the lagged error correction term (-1.48) is

statistically significant at 95 percent confidence interval, suggesting that previous year's errors (or deviation from long-run equilibrium) are corrected for within the current year at a convergence speed of 148 percent.

4.2.5. Estimation of Long Run Growth Model

It is important to consider the standardized β eigenvector and corresponding standardized α coefficients associated with cointegrating vectors when interpreting the long-term economic relationships between the variables. The following table reports the outcome of vector error-correction model.

Table 4.5. Estimated long-run coefficients using VECM

Variables	Coefficient	Standard Error	Z	P value
lnLAB	-0.04	2.4331	0.02	0.988
INV_{NA}	0.65	0.1072	-6.11	0.000*
AID	3.56	0.4452	-8.01	0.000*
SQAID	-0.12	0.0167	7.42	0.000*
AP	-1.53	0.2066	7.41	0.000*

Source: Model Result, Author's own computation, 2023

Note: *represent statistically significant at 5%.

The estimated long-run growth equation can be written as:

$$RGDPG_t = -0.04lnLAB_t + 0.65INV_{NAt} + 3.56ODA_t - 0.12SQODA_t - 1.53AP_t + \varepsilon_t$$

The outcome of the estimation shows that all explanatory variables are statistically significant in the long-run except lnLAB. The effect of lnLAB on real GDP growth is negative but statistically

insignificant. The negative sign may possibly highlight the low level of human capital development in the country.

The findings of the regression establish that non-aid financed investments have a positive impact on real GDP growth, which is consistent with the conventional economic growth theory. Besides, the effect of investment (non-aid financed) on real GDP growth is statistically significant, which implies INV_{NA} plays an important role in enhancing economic growth. Keeping other things constant, on average a one percent increment in the investment (non-aid financed) brings about 0.65 percent increase in real GDP growth in the long-run. The outcome is consistent with the findings of Yohannes (2011) in the case of Ethiopia.

The impact of aid on real GDP growth is statistically significant and positive, as expected a priori, according to the findings of the estimated model. Ceteris paribus, on average a one percent increment in AID brings about 3.56 percent increase in real GDP growth in the long-run. The outcome of the regression indicated the case of aid effectiveness on economic growth in Ethiopia. The result is consistent with the findings of Abeba (2002) in the case of Ethiopia. Effective utilization of the existing resources may be attributed to the long-term effectiveness of foreign aid. The result is consistent with the findings of Juselius et al. (2014), after studying the long-run impact of foreign aid in 36 African countries, the authors observed a statistically significant and positive association between foreign aid and growth. Likewise, Tasew (2011) also investigated the effect of aid on investment and growth in Ethiopia by employing multivariate co-integration analysis over the period 1970 to 2009 and found out that aid has a statistically significant and positive effect on growth in the long-run.

In line with the theoretical expectation of the squared aid term, the result of the regression point out the presence of capacity constraint of the economy in absorbing foreign aid. This implies the impact of foreign aid on economic growth tend to decrease beyond some threshold level in Ethiopia's economy. As nations with low level of human capital and bad institutions are typically considered to have a capacity constraint problem in absorbing excessive resources from other countries, the existence of a capacity constraint may be attributed to low level of human capital

and existence of poor institutions in the country (Kitessa, 2012). The result also coincides with the findings of Wondwossen (2003) for the case of Ethiopia.

On the other hand, aid interacted with policy variable is found to have a negative and statistically significant effect on real GDP growth in the long-run. However, the short-run growth equation suggest that the effect of one period lagged aid interacted with policy variable on the short-run change in real GDP growth is positive and statistically significant. Burnside and Dollar (1997) highlighted the vital role macroeconomic policies play in determining the effectiveness of foreign aid on economic growth. Yet, the outcome of the regression showed that the relationship between policy index and real GDP growth is negative in the long-run. This suggests the adverse effects of flawed policies in hindering aid effectiveness.

4.2.6. VECM Diagnostics and Tests

The adequacy of the estimated model is validated by employing different kinds of system diagnostic tests. The test for autocorrelation is done by using Lagrange-multiplier test and the outcome of the test confirms no autocorrelation at lag 1 and 2. The null hypothesis of the test is no autocorrelation is present at lag order. As shown from the below table, the p values are insignificant, thus rejecting the null hypothesis is impossible. This implies the VECM is free of the problem of autocorrelation at both lag 1 and 2.

Table 4.6. Lagrange-multiplier test for residual autocorrelation

Lagrange-multiplier test			
Lag	**chi2**	**df**	**Prob > chi2**
1	36.0228	36	0.46758
2	33.6071	36	0.58293

Source: Model Result, Author's own computation, 2023

Note: Since (Prob > chi2) > 0.05, the null hypothesis (H0: no autocorrelation at lag order) is accepted.

The normality test for VECM is undertaken by employing the Jarque-Bera test. The null hypothesis of the test is that the residuals of variables are normally distributed. As shown from the below table, the p values of all the variables are insignificant except D_lnLAB and D_INV_{NA}. Param et al. (2000) also suggested that the Johansen procedure is robust even with non-normal disturbances; hence the Johansen result still holds for growth equation. The outcome of the normality test indicates that apart from D_lnLAB and D_INV_{NA}, the residuals of all variables are normally distributed.

Table 4.7. Test for normally distributed disturbances

Jarque-Bera test			
Equation	**chi2**	**df**	**Prob > chi2**
D_RGDPG	0.721	2	0.69725
D_lnLAB	61.031	2	0.00000
D_INV_{NA}	7.321	2	0.02572
D_AID	0.497	2	0.77979
D_SQAID	0.601	2	0.74053
D_AP	0.470	2	0.79045
ALL	70.642	12	0.00000

Source: Model Result, Author's own computation, 2023

The plot of the eigenvalues companion matrix is used as a long-term stability test for the parameters. If a VECM comprises r cointegrating vectors and K endogenous variables, the companion matrix will have K - r unit moduli. As shown from the below table, the estimated VECM imposes five unit moduli in the companion matrix.

Table 4.8. Eigenvalue stability condition

Eigenvalue stability condition	
Eigenvalue	**Modulus**
1	1
1	1
1	1
1	1
1	1

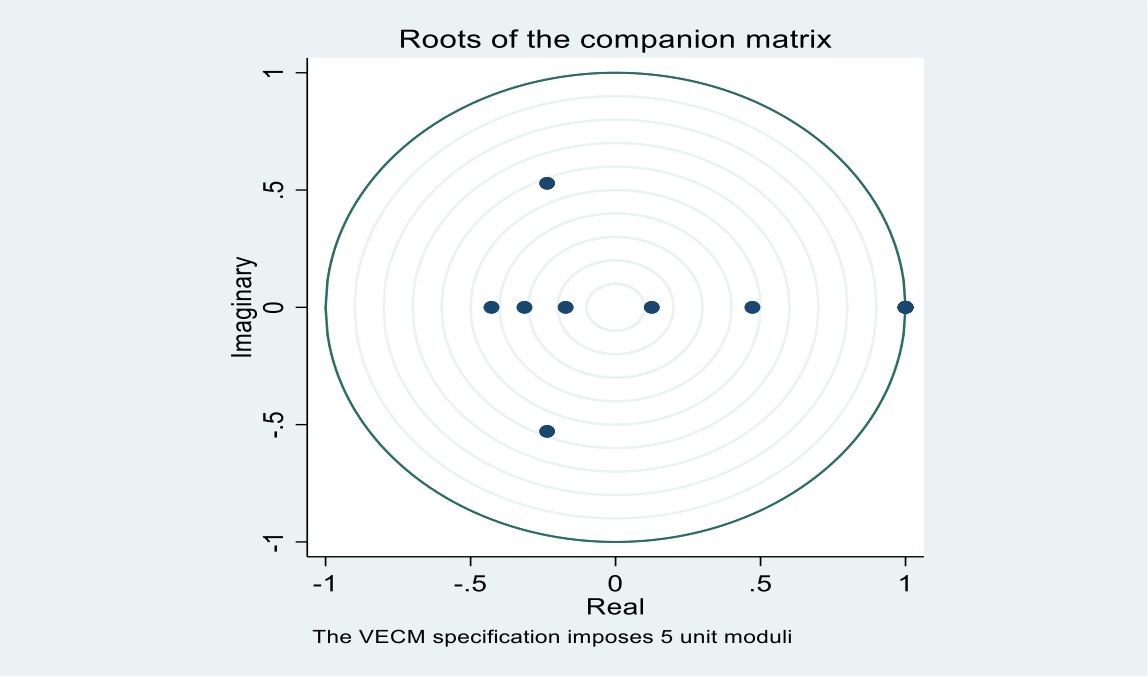
-.2201596 + .5607583i	.602428
-.2201596 - .5607583i	.602428
.4390164	.439016
-.3291139 + .1609643i	.366368
-.3291139 - .1609643i	.366368
.1334837	.133484
-.1140698	.11407

Source: Model Result, Author's own computation, 2023

Note: The VECM specification imposes 5 unit moduli.

Additionally, the plot of the eigenvalues of the companion matrix, which shows the stability of the model, is presented below in Figure 4.1., with the imaginary component on the y axis and the real component on the x axis.

Figure 4.4. Roots of the companion matrix



Source: Model Result, Author's own computation, 2023

CHAPTER FIVE

5. CONCLUSION AND POLICY IMPLICATIONS

In this section the summary, conclusion, policy implication and further research areas are presented based on the outcome of the data analysis undertaken. A brief summary and conclusion the study will be presented first and the policy implication grounded on the conclusion will follow. Finally, further study areas on the subject will be addressed.

5.1. Summary

Ethiopia, like other developing nations, has a low rate of domestic saving, making a lack of capital for development initiatives one of the challenging issues. As a result, the nation has to rely on foreign sources of funding. The effectiveness of foreign aid in promoting economic growth and the most efficient approaches to ensure that aid is valuable in accomplishing its intended goals have been strongly contested, despite the fact that it has contributed to alleviating the savings and foreign exchange bottleneck. The main aim of the study is to investigate the effectiveness of foreign aid on economic growth in Ethiopia using a time series data from 1991 to 2021. The effects of foreign aid on poverty reduction, social development and economic growth are used to determine its effectiveness.

The standard APF model has been widely employed in analyzing the effectiveness of foreign aid on economic growth in various nations. The APF model supposes that, in addition to conventional inputs of capital and labour used in constructing neoclassical production function, unconventional inputs such as foreign aid, the degree of trade openness, inflation, and budget deficit could possibly be incorporated in the model to account for their role in promoting economic growth.

Based on this notion, an operational growth model is specified by taking real GDP growth as a dependent variable and labor force, investment (non-aid financed), aid, square of aid, and aid interacted with policy as explanatory variables. Then, Johansen cointegration test method is used

to determine the number of cointegrating vectors among the variables of choice. Further, VECM is used to analyze the short-run relationship among the variables and its linkage with the long-run equilibrium path.

Before testing the presence of cointegrating equation among the variables, unit root test is undertaken to test the stationarity of the variables using ADF and PP test. Trace statistics test is also used to find out the number of cointegrating vectors and the outcome showed there is a maximum rank of two cointegration equations among the variables. Finally, the aid-growth relationship is tested based on the specified model by employing VECM.

5.2. Conclusion

The result from the estimated model indicates that the effect of lnLAB on real GDP growth is negative but statistically insignificant. This may possibly highlight the low level of human capital development in the country and shows the necessity to employ better human capital development strategies to increase the quality of labor force and to enhance its contribution to economic growth.

The outcome of the regression shows that investment (non-aid financed) affects real GDP growth positively, which coincides with the standard economic growth theory. Ceteris paribus, on average a one percent increment in the investment (non-aid financed) brings about 0.6 percent increase in real GDP growth. Moreover, the effect of investment (non-aid financed) on real GDP growth is statistically significant, which implies investment plays an important role in enhancing economic growth.

The impact of aid on real GDP growth is statistically significant and positive, as expected a priori, according to the findings of the estimated model. Ceteris paribus, on average a one percent increment in aid brings about 3.56 percent increase in real GDP growth. It indicates the case of foreign aid effectiveness on economic growth in Ethiopia. The findings may also imply the substantial investment required to meet the country's various development needs as well as the crucial role that foreign aid plays in fostering growth.

Aid squared variable has statistically significant and negative effect on real GDP growth indicating the presence of capacity constraint problem of the economy in absorbing foreign aid.

This implies the impact of foreign aid on economic growth tend to decrease beyond some threshold level in Ethiopia's economy. As nations with low level of human capital and bad institutions are typically considered to have a capacity constraint problem in absorbing excessive capital from other nations, the existence of a capacity constraint may be attributed to low levels of human capital and poor institutions in the country.

The outcome of the estimation indicated the case of foreign aid effectiveness on economic growth in Ethiopia. Yet, Sound economic policies and the mobilization of domestic resources are necessary for sustainable economic growth. Aid interacted with policy variable is found to have a negative and statistically significant effect on real GDP growth in the long-run, based on the estimated model. This suggests the adverse effects of flawed policies in hindering aid effectiveness. However, the effect of one period lagged aid interacted with policy variable on the short-run change in real GDP growth is positive and statistically significant. Hence, it is necessary to have good macroeconomic policy setting that promotes the effectiveness of aid in supporting the economic growth performance of the nation.

5.3. Policy Implications

The effect of labour force on real GDP growth is negative but statistically insignificant. The concerned bodies are expected to employ better human capital development strategies to increase not only the quantity but also the quality of labor force so that it can contribute to economic growth. Since labour force and domestic saving are internal factors, they can be used as a vital tool to enhance economic growth.

It has been seen that investment (non-aid financed) contributes positively to economic growth of Ethiopia in the long-run. This translates to the vital role that investment plays in fostering the country's growth. Ethiopia is regarded as one of the countries with low saving and low investment performances, which in turn results in low level of economic growth. Hence, the country should employ better strategies to mobilize domestic saving, which in turn increase domestic investment and boost growth.

The finding of the study shows the case of aid effectiveness on economic growth in Ethiopia. The nation lacks the necessary capital required to finance investment initiatives as well as the

foreign exchange needed to purchase capital goods and technologies. If foreign aid is combined with sound monetary, fiscal, and trade policies, it can be used to close the saving-investment gap and foreign exchange constraint and spur economic growth.

Additionally, the Ethiopian government should take proactive steps to make sure that foreign aid is effectively utilized to boost economic growth. This entails creating plans and programs that provide the highest priority to improving infrastructure, human capital, and domestic resource mobilization. Also, foreign aid should be coordinated with Ethiopia's national development policies and strategies to ensure that it is used to eradicate poverty and promote economic growth.

The result of the study indicates that the concerned body should have to set a sound macroeconomic policy setting which encourages domestic saving that is sufficient enough to fund investment projects and close between saving and investment rates. Although foreign aid can notably contribute to economic growth of Ethiopia, the country's dependence on external sources of finance should be reduced over time in order for the economy to sustainably growing without being reliant on aid.

5.4. Further Research

The analysis undertaken in this study lacked specifics on how to strengthen state institutions so that the nation could experience sustainable economic growth. In particular, concerns of maintaining the external viability are often linked to implementing a farsighted macroeconomic policy, promoting foreign direct investment, and engaging in global trade.

A further study is required on the issue of how to strengthen the institutions and capability of the nation to enhance the macroeconomic policy setting. Even though the main objective of this study is to examine the effectiveness of aid on economic growth in Ethiopia, the channel through which foreign aid contributes to the economy is beyond the scope of this study and additional empirical study is essential to find out the transmission mechanism of the impact of foreign aid to the economy.

The foreign aid-economic growth model developed in this study is also presented in aggregate form. If the benefits of foreign aid on growth could be broken down into key industries like

agriculture, industry, and services, it would be more enticing. This will make it easier to understand how foreign aid could impact economic growth.

REFERENCES

Abeba, S. (2002). *Macroeconomic Impact of External Assistance in Ethiopia* [Unpublished Master's thesis, AAU].

Adeyemi, A. O., Ojeaga, P., and Ogundipe, O. M. (2014). Is aid really dead? Evidence from Sub-Saharan Africa. *International Journal of Humanities and Social Science, 4(*10*).* https://ssrn.com/abstract=2523500

Alemayehu, G., and Kibrom, T. (2011). *Official development assistance (aid) and its effectiveness in Ethiopia* (Working Paper Serious NO. A07/2011). Institute of African Economic Studies.

Aruna, K. D. (2021). Does foreign aid influence economic growth? Evidence from South Asian countries. *Transitional Corporations Reviews*, *1*(14). https://doi. org/10.1080/19186444.2021.1974257

Azam, M., and Feng, Y. (2022). Does foreign aid stimulate economic growth in developing countries? Further evidence in both aggregate and disaggregated samples. *Quality & Quantity, 56(*2*)*, 533–556. https:// doi.org/10.1007/s11135-021-01143-5

Bacha, E. (1990). A three gap model of foreign transfer and the GDP growth rate in developing countries. *Journal of Development Economics, 32*(2).

Bhattarai, B. (2005). *The effectiveness of foreign aid: A case study of Nepal*. University of Western Sydney, Sydney, Australia.

Belay, A. and Girma, G. (2020). *The impact of foreign aid on economic growth in Ethiopia* [Master's thesis. Kyushu University]. Available at:

https://doi.org/10.21203/rs.3.rs-68484/v1

Burnside, C. and Dollar, D. (1997). *Aid, policies and growth* (Policy Research Working Paper No. 1777). World Bank, Washington, D.C.

Dollar, D. and Pritchett, L. (1998). *Assessing aid – what works, what doesn't, and why (English)*. World Bank policy research report Washington, D.C.: World Bank Group.

Doucouliagos, H. and Paldam, M. (2007). *The aid effectiveness literature: The sad results of 40 years of research* (Cambridge Working Papers in Economics No. 0773). Faculty of Economics, University of Cambridge.

Dreher, A., and Langlotz, S. (2017). *Aid and growth: New evidence using an excludable instrument* (Working Paper No. 5515). Center for Economic Studies & Ifo Institute.

Durbarry, R., Norman, G., and David, G. (1998). *New evidence on the impact of foreign aid on economic growth*. Centre for Research in Economic Development and International Trade, University of Nottingham.

Edwards, S. and Van Wijnbergen, S. (1989). *Disequilibrium and structural adjustment. Hand book of Development Economics.* Amsterdam: North Holland.

Feeny, S. and McGillivray, M. (2008). Aid allocation to fragile states: absorptive capacity constraints. *Journal of International Development*. *20*(7), pp.1 031-1 050.

Furtado, X. and Smith, J. (2007). *Ethiopia: Aid, Ownership, and Sovereignty* (GEG Working Paper, No. 2007/28). University of Oxford, Global Economic Governance Programme (GEG), Oxford.

Galiani, S., Knack, S., Xu, L. C., and Zou, B. (2016). *The effect of aid on growth: Evidence from*

a quasi-experiment (Working Paper No. 22164). National Bureau of Economic Research (NBER). Cambridge.

Gang, I. and Khan, H. (1991). Foreign aid, taxes and public investment. *Journal of Development Economics*. *35*, pp. 355-369.

Gomanee, K., Girma, S., Morrissey, O. (2005). *Aid and growth: Accounting for transmission mechanism in Sub-Saharan Africa* (Working Paper No.2005/60). UNU-WIDER, Research.

Griffin, K. (1970). Foreign capital, domestic savings and economic development. *Oxford Bulletin of Economics and statistics*, *32*(2), University of Oxford.

Gujarati, D. (2004). *Basic Econometrics* (4th ed.). Published in the McGraw-Hill Companies.

Hansen, H. and Tarp, F. (2001). Aid and growth Regressions. *Journal of Development Economics*.

Hendry, F. and Juselius, K. (2002). *Explaining Cointegration Analysis: Part II*. Discussion papers 00-20, University of Copenhagen. Department of Economics

Heller, P.S. (1975). A model of public fiscal behavior in developing countries: Aid, investment and taxation. *American Economic Review*. *65*(3), pp. 429-445.

Juselius, K., Møller, N. F., and Tarp, F. (2014). The long-run impact of foreign aid in 36 African countries: Insights from multivariate time series analysis. *Oxford Bulletin of Economics and Statistics*, *76*(2), 154–184. https:// doi.org/10.1111/obes.12012

Kitessa, D. (2012). *The impact of foreign aid on economic growth of Ethiopia* [Master's Dissertation. Jimma University].

Lancaster, C. (1999). Aid effectiveness in Africa: The unfinished agenda. *Journal of African Economies*, *8*(1), pp. 487 – 503.

Liew, C., Masoud, R. M., and Said, S. M. (2012). The impact of foreign aid on economic growth of east African countries. *Journal of Economics and Sustainable Development*, *3*(12), 129–138.

Mallik, G. (2008). Foreign aid and economic growth: A cointegration analysis of the six poorest African countries. *Economic Analysis and Policy, 38*(2): 251-260.

Mesfin, G. (2007). *Fiscal aggregates, aid and growth in Ethiopia: A vector autoregressive analysis* [Unpublished Master's thesis, AAU].

Organization for Economic Cooperation and Development. (2022). *Official development assistance (ODA).* https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/official-development-assistance.htm

Param, S., Silvapulle, P., and Jan, M. (2000). The effect of non-normal disturbances and conditional heteroskedasticity on multiple cointegration tests. *Journal of Statistical Computation and Simulation, 65*:1-4, 173-189

Singer, H.W. (1949). *Economic progress in underdeveloped countries*. Social Research. 16, pp. 1-11.

Tasew, T. (2011). *Foreign aid and economic growth in Ethiopia*. MPRA Paper No. 33953.

Trap, F. (2009). Aid effectiveness (Working paper 2009/05). UNU-WIDER.

Todaro, M. (2002). *Economic development* (8th ed.). New York: Pearson Addison Wesley

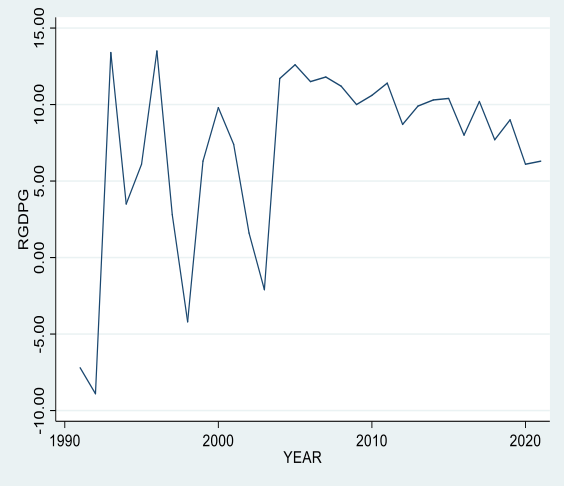
White, H. (1998). *Aid and Macroeconomic performance: Theory, empirical evidence and four country cases* (1st ed.). New York: St. Martin's press.

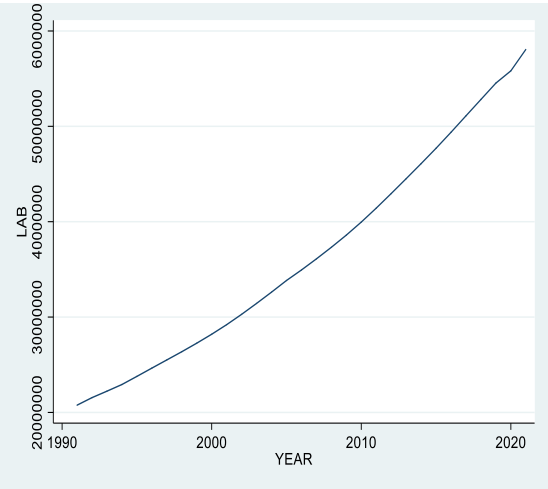
Wondwossen, T. (2003). *An empirical investigation of the aid-growth relationship in Ethiopia* [Unpublished Master's thesis, AAU].

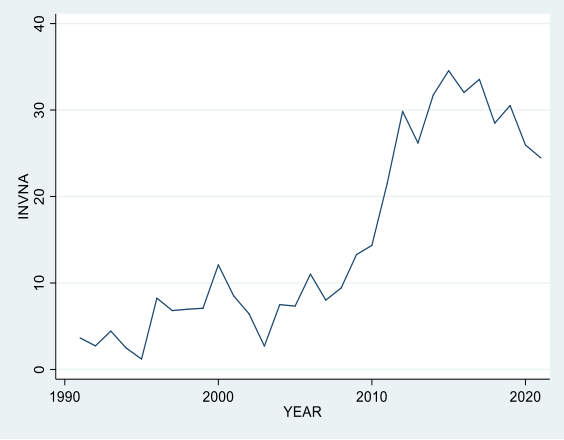
Yohannes, B. (2011). *The impact of foreign aid on economic growth in Ethiopia* [Master's thesis, AAU].

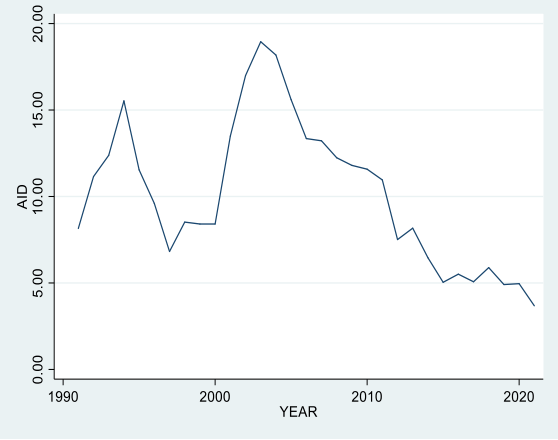
APPENDICES

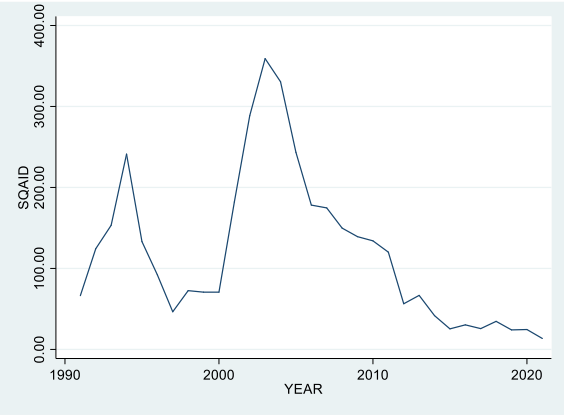
I. Graph of all Variables at Level

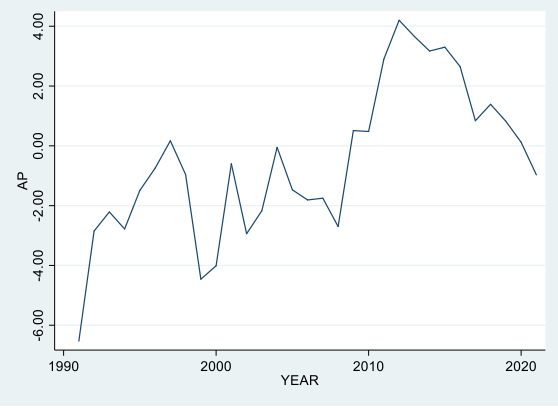




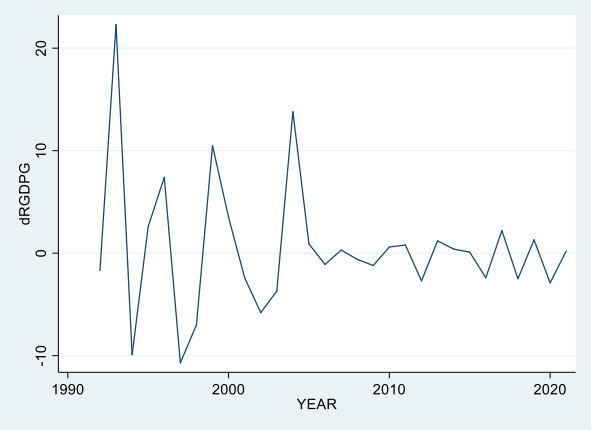


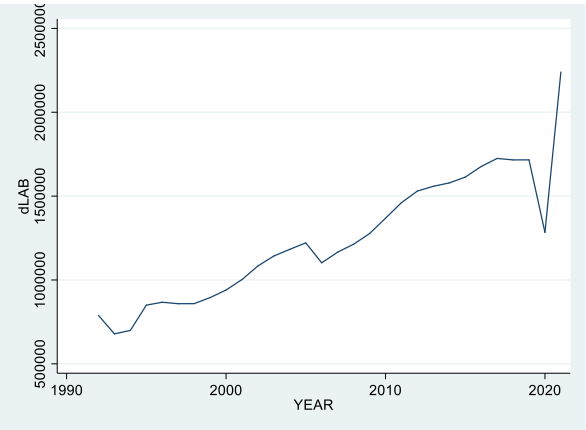


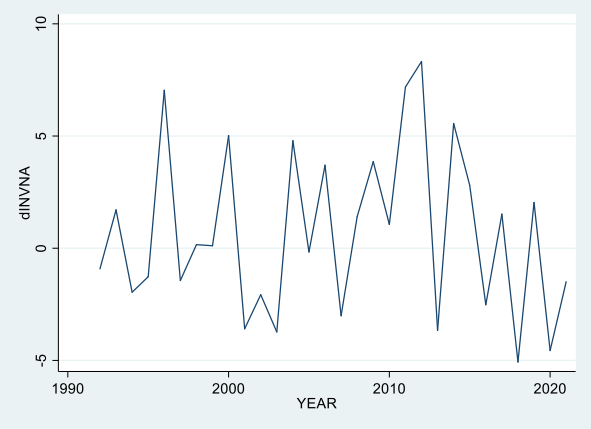


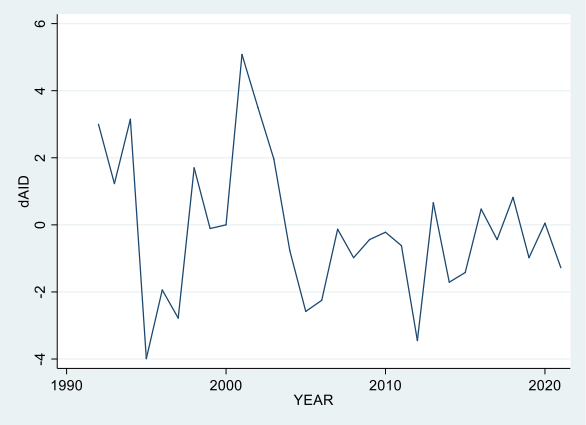


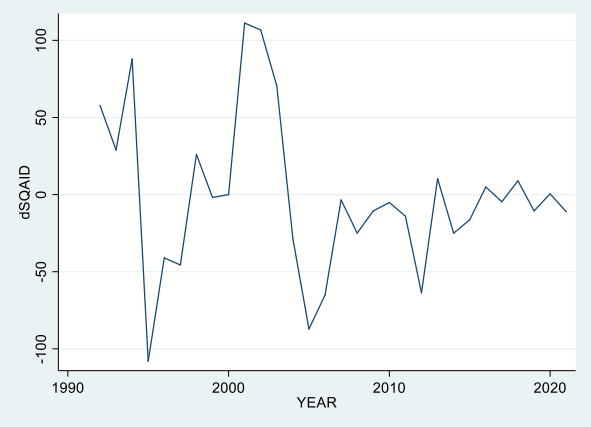
II. Graph of All Variables at their First Difference

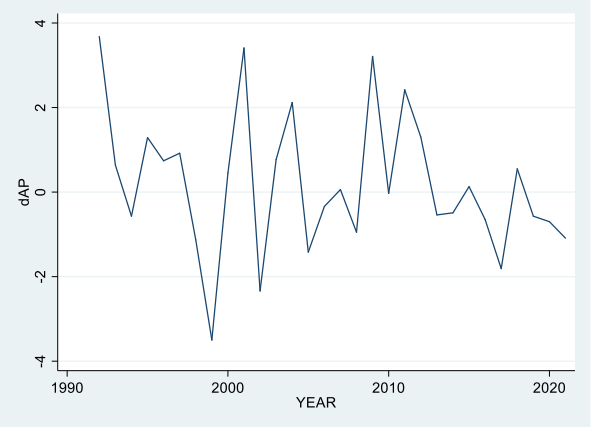












III. Derivation of Policy Index

Developing a growth equation with the budget deficit, inflation, and trade openness as explanatory variables is the first stage of constructing the policy index. Below is the finding of the growth regression's result.

$$RGDPG_t = 7.60 + 0.66\ BD_t - 0.07\ INF_t + 0.13\ OPEN_t$$

Then, the policy index for each year is constructed by taking the coefficients of the policy variables.

$$AP_t = 0.66\ BD_t - 0.07\ INF_t + 0.13\ OPEN_t$$

IV. Derivation of Non-aid Financed Investment

Incorporating foreign aid and investment into one equation will lead to biased estimation since it give rise to double counting since some of the foreign aid is used to finance investment. Thus, so as to address this problem, the study covers the amount of investment that is not funded by foreign aid. Part of investment not included in foreign aid is computed using the residual regressor method.

The residual regressor approach involves regressing investment on a foreign aid. At the end, a portion of investment not funded by foreign aid is generated using the residual from the regression result.

Thus, a portion of investment that is not funded by foreign aid is obtained from the regression of the bellow equation.

$$INV_t = \delta_0 + \delta_1\ AID_t$$

By taking the coefficient from the regression outcome, the level of non-aid funded investment (INV_{NA}) is computed.

$$INV_{NA} = INV - 0.96AID$$

V. Outcome of the Model (VECM)

Vector error-correction model

Sample: 1993 - 2021	Number of obs	=	29
	AIC	=	17.88113
Log likelihood = -206.2763	HQIC	=	18.66374
Det(Sigma_ml) = .0607306	SBIC	=	20.37998

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_RGDPG	8	3.46918	0.7940	80.96263	0.0000
D_lnLAB	8	.003132	0.9940	3454.543	0.0000
D_INVNA	8	3.71048	0.3025	9.109407	0.3332
D_AID	8	2.1471	0.1832	4.711176	0.7880
D_SQAID	8	52.524	0.2003	5.260829	0.7294
D_AP	8	1.63094	0.1682	4.24666	0.8342

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
D_RGDPG						
_ce1						
L1.	-1.484767	.2038859	-7.28	0.000	-1.884376	-1.085158
RGDPG						
LD.	.2111139	.1315799	1.60	0.109	-.0467781	.4690058
lnLAB						
LD.	324.8825	257.4704	1.26	0.207	-179.7501	829.5151
INVNA						
LD.	-.5361286	.242651	-2.21	0.027	-1.011716	-.0605415
AID						
LD.	.0472466	1.54151	0.03	0.976	-2.974057	3.06855
SQAID						
LD.	-.072515	.0577928	-1.25	0.210	-.1857868	.0407568
AP						
LD.	.9828812	.4448932	2.21	0.027	.1109065	1.854856
_cons	-32.97325	8.834498	-3.73	0.000	-50.28855	-15.65796

D_lnLAB						
_ce1						
L1.	.0001741	.0001841	0.95	0.344	-.0001867	.0005349
RGDPG						
LD.	-.000116	.0001188	-0.98	0.329	-.0003488	.0001168
lnLAB						
LD.	.0142148	.2324368	0.06	0.951	-.4413529	.4697825
INVNA						
LD.	.0000289	.0002191	0.13	0.895	-.0004004	.0004583
AID						
LD.	.0000762	.0013916	0.05	0.956	-.0026514	.0028037
SQAID						
LD.	.0000132	.0000522	0.25	0.801	-.0000891	.0001154
AP						
LD.	.0001013	.0004016	0.25	0.801	-.0006859	.0008885
_cons	.0363489	.0079755	4.56	0.000	.0207172	.0519807
D_INVNA						
_ce1						
L1.	-.0246041	.2180676	-0.11	0.910	-.4520088	.4028006
RGDPG						
LD.	.0408812	.1407323	0.29	0.771	-.2349491	.3167114
lnLAB						
LD.	484.032	275.3793	1.76	0.079	-55.70158	1023.766
INVNA						
LD.	-.4149493	.2595291	-1.60	0.110	-.9236171	.0937184
AID						
LD.	.8097654	1.648733	0.49	0.623	-2.421692	4.041223
SQAID						
LD.	-.0583636	.0618127	-0.94	0.345	-.1795143	.062787
AP						
LD.	.1333387	.4758388	0.28	0.779	-.7992883	1.065966
_cons	-15.85253	9.449003	-1.68	0.093	-34.37223	2.66718

D_AID						
_ce1						
L1.	-.1306877	.1261867	-1.04	0.300	-.3780091	.1166336
RGDPG						
LD.	.0954562	.0814359	1.17	0.241	-.0641553	.2550677
lnLAB						
LD.	-49.51049	159.3506	-0.31	0.756	-361.8319	262.8109
INVNA						
LD.	-.0074849	.1501787	-0.05	0.960	-.3018298	.28686
AID						
LD.	-.6671913	.9540535	-0.70	0.484	-2.537102	1.202719
SQAID						
LD.	.0330092	.0357684	0.92	0.356	-.0370957	.103114
AP						
LD.	.1586697	.2753482	0.58	0.564	-.3810028	.6983423
_cons	-.6419333	5.467746	-0.12	0.907	-11.35852	10.07465
D_SQAID						
_ce1						
L1.	-2.669854	3.086868	-0.86	0.387	-8.720004	3.380296
RGDPG						
LD.	2.262675	1.992144	1.14	0.256	-1.641855	6.167205
lnLAB						
LD.	-1905.962	3898.147	-0.49	0.625	-9546.189	5734.265
INVNA						
LD.	-.0104001	3.673778	-0.00	0.998	-7.210873	7.190073
AID						
LD.	-12.93129	23.33873	-0.55	0.580	-58.67435	32.81178
SQAID						
LD.	.7596768	.874993	0.87	0.385	-.955278	2.474632
AP						
LD.	3.799731	6.735762	0.56	0.573	-9.402119	17.00158
_cons	18.64969	133.7559	0.14	0.889	-243.507	280.8064

D_AP						
_ce1						
L1.	-.0962027	.0958514	-1.00	0.316	-.2840679	.0916626
RGDPG						
LD.	.0444408	.0618587	0.72	0.472	-.0768001	.1656817
lnLAB						
LD.	66.33768	121.0427	0.55	0.584	-170.9016	303.577
INVNA						
LD.	.0575732	.1140757	0.50	0.614	-.1660112	.2811575
AID						
LD.	-.8090482	.7246989	-1.12	0.264	-2.229432	.6113355
SQAID						
LD.	.0294391	.0271697	1.08	0.279	-.0238125	.0826908
AP						
LD.	-.0616083	.2091544	-0.29	0.768	-.4715435	.3483269
_cons	-3.746386	4.153299	-0.90	0.367	-11.8867	4.39393

Cointegrating equations

Equation	Parms	chi2	P>chi2
_ce1	5	151.2498	0.0000

Identification: beta is exactly identified

Johansen normalization restriction imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1						
RGDPG	1	.	.	.	.	.
lnLAB	.0365236	2.433066	0.02	0.988	-4.732199	4.805246
INVNA	-.6548438	.107246	-6.11	0.000	-.8650421	-.4446455
AID	-3.564402	.4451704	-8.01	0.000	-4.43692	-2.691884
SQAID	.1240475	.0167132	7.42	0.000	.0912903	.1568047
AP	1.531757	.2065909	7.41	0.000	1.126847	1.936668
_cons	8.567869	.	.	.	.	.