



**THE IMPACT OF BUDGET DEFICIT AND AID ON ECONOMIC
GROWTH IN ETHIOPIA**

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The Impact of Budget Deficit and Aid on Economic Growth in Ethiopia

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DECLARATION

I hereby declare that this Thesis entitled “The Impact of Budget Deficits and Aid and Economic Growth in Ethiopia has been carried out under the guidance and supervision of Sisay Debebe (PhD).

The Thesis is original and has not been submitted for the award of any degree or diploma to any university or institutions.

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ACRONYMS AND ABBREVIATIONS

ARDL.....	Autoregressive Distributed Lag
FDI	Foreign Direct Investment
GDP.....	Gross Domestic Product
GNP.....	Gross National product
MoFED.....	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
ODA.....	Official Development Assistance
OECD.....	Organization for Economic Cooperation and Development
RGDP.....	Real Gross Domestic Product
SPSS.....	Statistical Package for Social Science
STATA.....	South Texas Art Therapy Association
VAR.....	Vector Auto Regressive
VECM	Vector Error Correction Model

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ABSTRACT

The study provides empirical results to investigate the relationship between budget deficit, aid and economic in Ethiopia. Specifically the existence of the relationship between budget deficit, aid and economic growth in the country was tested with secondary time series data starting from 1990/91 to 2018/2019. Data from National bank of Ethiopia, ministry of finance and economic development and world development indicators collected through organizations' database and through letter requesting the same was used to conduct the study. VAR (vector Auto regressive approach) and vector error correction model (VECM) approach was used to investigate the relationship between budget deficit and economic growth while Harrod-Domer to investigate the relationship between aid and growth. The major findings of the study were positive relationship between budget deficit and economic growth both in the short run and long runs which supports Keynesians theory. However, aid has positive relationship with economic growth in the short run and negative impact in the long run. According to the VECM result a percentage change in aid results in 0.18% decrement of economic growth and a percentage change in budget deficit results in 0.16% increment of economic growth other variables being constant. The study suggests the increase of revenue by broadening tax base through establishing pragmatic system and expend on prioritized productive sectors like health, education, infrastructure sectors such as power, telecom, roads etc., so that it will enhance the return of both human capital and physical capital, which will go a long way in increasing the national income.

Keywords: *Budget Deficit, Aid, Economic Growth, GDP, Ethiopia, VAR, VECM*

1. INTRODUCTION

1.1. Background of the Study

Budget is defined as amount of money reserved for a particular institution, activity or time-frame, which is a component of the financial plan. Budget can be either deficit or surplus depending on planning (Haideret.al 2013; Nikoloski and Nedanovsk, 2017), explained budget as a significant instrument of economic policy. They added that, Budget can be adequate when actual costs are in line with the plan otherwise the budget could be in deficit or in surplus. According to them, in modern circumstances budgets of individual or governments are often results deficit since public expenditures exceed revenues collected through tax and non-tax sources. Deficit could also be a consequence of delays in the gathering of revenues.

Aid can be conceptualized through different ways. For instances, The Development Assistance Committee of the Organization for Economic Cooperation and Development (OECD) views aid as official development assistance; consisting of grants or loans that one government or multilateral organization gives to a developing country to promote economic development and social welfare. Haile Hypothesizes foreign aid as an international transfer of capital, goods, or services for the benefit of other nations. According to him such Capital transfers, in cash or kind, either as grants or loans, Technical assistance and training, usually as grants in the form of human resources and technical equipment, and Military assistance in the form of either equipment or training advisors (Haile, 2015).

According to IMF report, In 2017/18, real gross domestic product (GDP) of Ethiopia grew by 7.7 percent, driven by favorable harvests and rapid growth in air transport and manufacturing exports. However, political uncertainty, foreign exchange shortages, and adverse terms-of-trade trends hampered economic activity. The authorities succeeded in reducing the external current account deficit to 6.4 percent of GDP in 2017/18 through determined policies to restrict public sector imports and borrowing and a tight monetary policy stance. Prudent budget execution led to a lower-than-planned fiscal deficit, estimated at 3.7 percent of GDP. Tax revenue continued to disappoint and was offset by expenditure savings, while ring-fencing pro-poor programs. Inflation, at 12 percent in September 2018, has edged down but remains above the National Bank of Ethiopia (NBE)'s single-digit target reflecting lagged effects of public sector credit expansion in 2017, pass through of the October 2017 devaluation, and political disruptions which affected distribution networks. The NBE reduced

the growth of base money from 32 percent in July 2017 to 19 percent in June 2018 to rein in inflation. However, broad money and credit growth remained strong (IMF, 2018).

There are various ways of financing deficits Epaphra, (2017) listed some ways through which budget deficit can be financed. For instances, domestically borrowing, borrowing from the World Bank or the International Monetary Fund (IMF) and minting currency by the central bank and through foreign aid from different agencies and donor governments. The relationship between budget deficit, aid and economic growth remains one of the widely debated topics among policy makers and economists. This study therefore examines The Impact of budget deficit and aid on economic growth in Ethiopia.

1.2.. Statement of The Problem

There is academic debate between different school of thought regarding the relationship between budget deficit and economic growth. For instances, according to Neoclassical school of thought budget deficit has a negative effect on economic growth, through triggering real interest rates to grow and private investments to crowd out of the economy (Binh and Hai, 2013). On the other hands, according to Keynesians budget deficit has a positive effect on the economy. The positive impacts of budget Deficit can be explained by emphasizing on the multiplicative economic effects of budget deficit, or the “crowding-in” effect. Ricardian equivalence theory suggested that budget deficit does not have any direct effect on the economy (Barro, 1989).

Nowadays, there is an Increasing budget deficits as a common landscapes of most developing countries. Easterly & Schmidt-hebbel(1993), identified the consequences of budget deficits with their empirical literatures, and such consequences of such deficits includes inflation, devaluation of currency, deteriorating gross domestic product, fiscal adjustment, which constitute important element of the economic agenda. According to them, Deficits are often credited to high government expenditure and caused by rising public spending over and above public revenue. Easterly & Schmidt-hebbel(1993) also argued that a significant part of the economic problems-such as unsustainable debts, high inflation, low levels of investment and economic growth experienced by developing countries since the 1980s have been attributed to the sustenance of fiscal deficits. When budget deficit is financed by externally borrowed funds, the appreciation of the exchange rate resulting from the inflow of foreign exchange will affect the performance of exports leading to the deterioration of the current

account balance. Additionally, Growth in the country's external debt stock which could result into a debt crisis is the result of financing budget deficit through externally borrowed funds (Lwanga and Mawejje, 2014).

Eminer (2015) explained that Economic instability has become common structural problem for many developing countries and budget deficit has to be considered as a main problem for the economy. He added that the source of the budget deficit could be explained either with inability of collecting taxes or high government spending or both of them. Moreover, he explained high government spending or budget deficit does not always result with negative impact on the economy. If the budget expenditure is too high and if the government use it for productive purposes and not for political interest then the budget deficit could result with economic growth.

Kourtellos, et.al (2007) States that one of the most controversial debates in the empirical growth literature with big policy implications is whether foreign aid is beneficial to a country's economic growth or not. A number of studies have been presented in recent years attempting to answer the question, using econometric techniques to analyze both cross-sectional and panel data on economic growth and aid (commitments or disbursements) in order to infer the relation between them. So the study is aimed at finding the relation between budget deficit, aid and economic growth especially during the recent times because many studies are made on the same title during the old times and found different results.

When we come to our country Ethiopian budget deficit is the common features of the country in the past two decades (Ermias, 2018).According to Yohannes (2011), High level of budget deficit has been also one of the characteristics of the Ethiopian macro economy. Regardless of the government's high expenditure in developmental projects, the revenue that it gets is insufficient to finance such spending. This created a gap between the two variables. According to Teamrat (2018), Ethiopia has experienced both current account and budget deficits since the 1960s. According to him, long-term and government budget deficits have unwanted effects on a nation's long run development prospects. The rising government budget deficits along with steady current account deficits have to be an essential and urgent issue for policy-makers in the country. Budget deficit could hold back economic activities and cause a decline in output growth and thereby reducing the well-being of a nation. The relationship between budget and current account deficits has important policy implications

for a number of reasons; first, persistent large deficits cause indebtedness by borrowing internally and externally, second, it imposes burden on future generations.

According to Haile (2015) Sub Saharan African countries has been receiving significant foreign aid inflows, but there is no satisfactory the economic growth has been attained by many countries. Thus, the relationship between aid and economic growth has been remained as controversial issues between different economists for the past times. Ethiopia has been one of the major recipients of international aid. For instances, according to world bank report Ethiopia has received USD 1, 356, 900, 024 at the beginning of 1960. The amount received was increased overtime and received USD 4,732,240,234 at the end of 2018(World Bank, world development indicator, 2020). This means the aid received from foreign country increased with 28.67% between those years. Yet the amount remained very low until the 1980s when the devastating 1984 famine resulted in sharp increase in official development assistance (ODA), mainly in the form of humanitarian aid (Alemayehu and Kibrom, 2011). On another ways, the country Ethiopia is in budget deficit for the period starting from 1980 to 2018 and its respective GDP is going with almost the same percent. Ethiopia's budget balance in relation to GDP between, in 2019, Ethiopia's budget deficit amounted to around 2.53 percent of GDP. Thus this study is therefore examines the impact of budget deficit and on economic growth in Ethiopia.

1.3.Research Hypotheses

As stated above the research expected to test the hypotheses. i.e. the relationship between budget deficit and economic growth and the relationship between aid and economic growth in Ethiopia. So the research hypothesis will be;

H₀: There is no significant impact of budget deficit on economic growth

H₁: There is a significant relationship between budget deficit and economic growth.

H₀: There is no significant relationship between aid and economic growth.

H₁: There is a significant relationship between aid and economic growth.

1.4.Objectives of The Study

1.4.1. General Objective

The general objective of the study is to analyze the impact of budget deficit and aid on economic growth in Ethiopia.

1.4.2. Specific Objectives

Specific objectives of study are:

- i. The impact of budget deficit on economic growth in short and long run.
- ii. The impact of multilateral and bilateral aid on economic growth in short and long run.

1.5.Scope and limitations of The Study

The scope of the study is to investigate the relationship between budget deficit, aid and economic growth to the country level Ethiopia. The researcher aimed at using time series data covering from 1991 to 2018/19 to investigate the relationship between budget deficits, aid economic growth. The period was selected in the expectation of accurate and clear data since there was no regime change during the period. Unavailability of literature regarding the study area is one of challenges. The researcher referred different literatures related to the study area. However, he didn't found sufficient researches conducted specifically on the study area he selected. The topic the researcher select is seems like two titles. It is investigating the relationship between budget deficit and economic growth and the relationship between aid and economic growth in Ethiopia at the same time. Thus, data shortage will be one of the limitations that expected to face the researcher. One of the problems is that most studies of the aid-growth relationship are based on cross country regressions, which lump together countries of heterogeneous characteristics and size. There are very few studies of the poorest African countries that examine the issue using single country time series data.

1.6.Significance of The Study

Ethiopia is one of developing countries and budget deficit is common problem in the country. In addition to this, aid is one of instruments that the country applies to finance its budget deficit. So this study will help the country Ethiopia by investigating the relationship between budget deficit, aid and economic growth and puts direction to enhance economic growth of

the country. The result of this study also helps other researchers to investigate the impact of budget deficit and aid on economic growth in Ethiopia. Other researcher may use the result of this study to make further investigation and will be reference for another investigation related the issues. Findings of the study may help the country on which the research will be conducted to make corrective actions how to finance and resolve budget deficit. In general the significance of the study can be seen in two ways i.e analytical significance (to produce knowledge) and policy significance.

1.7.Organization of The study

The rest of the paper will be organized as follows. Chapter two presents the review of related literatures. Chapter three provide detail description of the methodology employed by the researcher. Chapter four contains data analysis presentation and interpretation. Finally, the last chapter concludes the total work of the research and gives relevant recommendations based on the findings.

2. LITERATURE REVIEW

2.1. Theoretical Literature Reviews

2.1.1. Concepts of budget and budget deficit

Different studies mention Budget deficit as one of the economic problems facing both developed and developing countries/economies. For instances, Keho, (2016), confirms that There has been occurrence of large government deficit in sub-Saharan Africa starting from the late 1970s and its effect on economic growth is remained a controversial issue among policymakers and economists. Ahmad and Rahman (2017) added that term budget deficit usually leads to governments to a situation when spending exceeds income and urges the government either to print more money, to levy more tax, or to borrow from the public to finance this deficit.

As stated on my introduction parts and above, it is possible to conclude that budget deficit occurs when the expected expenditures exceed the expected revenue. This means budget deficit is simply the imbalance between government expenditure and government revenues. So deficit may occur when government expenditure exceeds government revenues. Governments expenditures may be defined as all money spent on all projects in one countries including transportation, education, defense, and civil administration and etc. Government revenue is the all incomes government expected to collect from different sources, whether these revenues are from taxes or non-taxes (Ermias, 2018).

As stated at different parts paper, Deficit budgeting is common characteristic of almost all budgets in today's world. So in order perform all planned government activities mentioned above, budget deficit needs to be financed by different mechanisms. According to Winnyrose (2013), Deficit financing is the case in which the government is spending in excess of revenue and the deficit is being met by drawing money from the Central Bank of the country. He added this leads to creation of money a move that can be helpful in initiating the process of development where a large volume of unemployed resources exist. It will also bring about not only an expansion of the monetized sector but also provides an easy way of obtaining capital for development schemes.

The World Bank definition of budget deficit is the difference between expenditure items including interest on government debt, transfers and subsidies, and revenue items including

grants and sale of assets. In support of this line of argument, the IMF business reports of 2016 gives a functional definition of budget deficit as follows:

$$\text{Budget deficit} = [(\text{Expenditure on goods and services} + \text{transfers}) - (\text{revenue} + \text{grants}) + (\text{lending} - \text{repayments})].$$

Budget deficit is functionally defined as follows):

$$\text{Gross budget deficit} = \text{Total Expenditure} - \text{Recovery of Loans and Advances} - \text{Revenue Receipts} - \text{Non Debt Capital Receipts} - \text{Repayment of debt.}$$

Budget deficit measures the extent to which government expenditure exceeds government revenue that needs to be financed. Budget deficit measures the overall gap in the expenditure and revenue of government that represents a liability which needs to be covered either by borrowing or through monetization. In essence, it measures the debt-financed and money-financed deficit. This reflects the current cash flow position of the government. Hence, budget deficit provides a measure of government's contribution to aggregate demand in the economy. It also helps measure the crowding out of the private sector in the financial markets (Ermias, 2018).

2.1.2. Economic Growth

Economic growth can be described through different ways for instances Winnyrose (2013) defined Economic growth as an increase in a country's output i.e. the production of goods and services. According to him, economic growth is also sometimes described as an increase in average incomes and standard of living of certain countries society. However, the latest definition may be nearest to the term economic development.

According to statistics on the growth of the global GDP report of IMF Economic growth is simply defined as an increase in the level of output of goods and services that is sustained over a period of time, measured in terms of value added. Process of economic growth is essentially a dynamic concept and refers to a continuous expansion in level of output, i.e. it refers to forces that generate a positive rate of change over time and not the forces that lead to discrete (or one shot) change from a lower to higher level of output which are temporary and short lived (Ermias, 2018).

Economic growth is commonly measured by a country's gross domestic product (GDP) which is the total value of the goods and services produced during a set period of time. There are two ways of measuring GDP, nominal GDP and real GDP. Nominal GDP calculates the value of all the goods and services produced during a set period of time using current prices. Real GDP involves calculating the value of all the goods and services produced during a set period of time using constant prices. Economists usually use real GDP when calculating economic growth in a country because it takes inflation into account (Winnyrose, 2013).

All literatures related to economics defined the above mentioned terms similarly as GNP is a similar measurement to GDP. For instances Winnyrose (2013) defined GNP as the total value of all the goods and services produced by a country's own citizens during a set period of time. This means that it excludes the value of production from foreign firms and citizens but includes the value of production from firms and citizens who are overseas. He added Just like GDP, GNP can be measured in nominal terms which uses current prices or in real terms which accounts for inflation (Winnyrose, 2013).

Many measures of economic growth such as GDP and GNP can also be measured in per capita terms. Per capita is simply a measurement of economic growth per person. Therefore, GDP per capita is the total value of all the goods and services produced in a country during a set period of time divided by the total population of the country. Per capita is useful because it shows whether or not output is increasing per person (Ermias, 2018).

2.1.3. Determinants of economic growth

The neo-classical Solow model explains economic growth as resulting from the combination of two elements, namely Capital and Labor. Now the question arises as to how much of the output growth can be attributed to other factors apart from capital and labor. To answer this question, Solow decomposes the growth in output into three components, each identifiable as contribution of one factor of production, that is labor, capital and total factor Productivity. This type of measurement of total factor productivity is still often referred to as the Solow residual. The term residual is appropriate because the estimate present the part of measured GDP growth that is not accounted for by the weighted-average measured growth of the factors of production (capital and labor) (Haile 2015).

Solow defined his other factor (total factor productivity) to be technology. Solow acknowledged the convenience of the Cobb-Douglas production function because it exhibits constant returns to scale which is consistent with his model. We should note that the variable A is not constant but varies with different production functions based on the factors studied (Haile, 2015).

According Haile (2015), other important determinants of growth (positively or negatively) include government consumption expenditure, taxes, population growth, and measures of rule of law, governance, inflation and democracy. In a single country study, the time series approach cannot incorporate all these factors; some are not measured annually, some change very slow over time (and would thus be poor at explaining annual growth which can vary significantly) and there is simply a limit to the number of variables that can feasibly be included. Hence the focus of the current paper is only a sub-set of factors; within the large literature on growth determinants; it focused on foreign aid, taking capital, labor force, policy environment, Financial deepening, mean annual rain fall and human capital as control variables.

According to Boldeanu and Constantinescu, the determinants of economic growth are inter-related factors influencing the growth rate of an economy. There are six major factors that determine growth with four of them been grouped under supply determinants and the other two are efficiency and demand. The four supply factors are natural resources, capital goods, human resources and technology and they have a direct effect on the value of goods and services supplied. Economic growth measured by GDP means the increase of the growth rate of GDP, but what determines the increase of each component is very different. Public expenditure, capital formation, private or public investment, employment rates, exchange rates etc. have different impacts on economic growth and we should take into account that these determinants have different implications if the states are developed or not. There are also socio-political factors and events that have a major influence on the economic advancement of a country. There are also differences between economic and non-economic determinants. “Proximate” or economic determinants refers to factors like capital accumulation, technological progress, labour and “ultimate” or non-economic sources refers to factors like government efficiency, institutions, political and administrative systems, cultural and social factors, geography and demography (Boldeanu and Constantinescu, 2015).

2.1.4. The Impact of Budget Deficit on Economic Growth

There are three schools of thought, namely, the Neo-classical, Keynesian and Ricardian through which the effects of budget deficit on macroeconomic factors are addressed. According to the Neoclassical school of thought budget deficit has a negative effect on economic growth, through triggering real interest rates to grow and private investments to crowd out of the economy. It further argues that debts must be repaid, and it will, therefore, be a burden on future generations (Binh and Hai, 2013).

On the other hands, according to Keynesians budget deficit has a positive effect on the economy. The positive impacts of budget Deficit can be explained by emphasizing on the multiplicative economic effects of budget deficit, or the “crowding-in” effect. Keynes stated that the government use budget deficit to stimulate demand in the economy in times of recessions and depressions. The school of thought elaborates the effect of budget deficit on economic can be generated through the increased size of the market, due to government deficits, can stimulate the economy by raising business profitability and spurring optimism, which encourages private fixed investment in factories, machines, and the like to rise. According to Keynesians this accelerator result inspires demand further and encourages rising employment. When we come to the third one, Ricardian equivalence theory suggested that budget deficit does not have any direct effect on the economy. This is Because of increased public consumption has to be paid, the reduced taxes in the current year must correspond with the same increase in the present value of future taxes thereby leaving public consumption and interest rates unchanged (Barro, 1989).

Budgetary policy plays a vital role in assisting countries achieve macroeconomic stability, poverty reduction, income redistribution and sustainable growth. For this reason, most governments use the budget as effective tool in achieving their economic objectives. This means that large and accumulating budget deficit may not necessarily be a bad policy objective if such deficits are effectively utilized to enhance economic growth (Ermias, 2018).

Nikoloski and Nedanovski (2017) reviewed different paper and reached on the following conclusions. If the budget deficit is a result of reducing the distorting taxes, the effect on economic growth would be positive one. If the budget deficit is a result of reduced not distortionary taxes, economic growth would not be achieved. If the budget deficit is a result of increasing the productive government expenditures, the effect on economic growth would

be positive. If the budget deficit is a result of increasing the unproductive government expenditures, the economic growth will not be achieved, and the growth rate can be reduced if the amplitude of the deficit is a significant one.

The impact of the fiscal deficit on economic growth is one of the most argued issues among economists and policymakers. The investigated results did not unite in the same way in the literature of the effect of fiscal deficit on growth. There were some empirical studies which focused on fiscal deficit issue and its effect on economic growth, however, the literature review had got some kinds of the evidence including negative, positive effect or non-effect on this relationship (Tung, 2018).

As stated above there are many controversy between the relationship between budget deficit and economic growth. The issue got special attentions because of Budget deficit or budget surplus is one of the most important macroeconomic factors that have an impact on economic growth. For instances, Eminer (2015) concluded that, If budget deficit is a result of minimization of distortionary taxes or increase at productive public expenditure economic growth will be positively affected. But if the deficit is because of non-productive public expenditure, the economic growth will be affected negatively.

2.1.5. Concept of aid

Aid can be conceptualized through different ways. For instances, The Development Assistance Committee of the Organization for Economic Cooperation and Development (OECD) views aid as official development assistance; consisting of grants or loans that one government or multilateral organization gives to a developing country to promote economic development and social welfare (Haile, 2015). In addition to this Haile, 2015) hypothesizes foreign aid as an international transfer of capital, goods, or services for the benefit of other nations. According to him such Capital transfers, in cash or kind, either as grants or loans, Technical assistance and training, usually as grants in the form of human resources and technical equipment, and Military assistance in the form of either equipment or training advisors.

According to Yohannes (2011), Foreign Aid is a one means in which resource is transferred from developed countries government and international institution to developing countries for different purposes. The beginning of this foreign aid traces back to the 1940s and 1950s

‘Marshal Plan’ in which the western economy gave financial assistance for the war ridden economy of Eastern Europe after savior devastation in Second World War.

There are two types of aid: grant aid and loan aid. Both of them can be divided as bilateral and multilateral components. Bilateral aid is administered by agencies of each donor government such as New Zealand Official Development Assistance (NZODA), Australian Agency for international Development (AusAid), Swedish International Development Authority (SIDA), etc. Multilateral aid is founded by contributions from developed countries governments and administered by international institutions. Some examples of multilateral institutions includes the world bank group, the regional banks (e.g Asian development bank and Inter-American Development bank) and the United Nations (UN) family of specialized agencies (e.g. UN Development Programme (UNDP), The United Nation Conference on trade and Development (UNCTAD), and Food and Agriculture Organization (FAO) (Xayanvong, 2002)

According to different literatures for instances, (Haile, 2015), Developing countries are characterized by specifically capital related resource starved economies. As far as our country Ethiopia is categorized in developing countries, it is characterized by the above mention characteristics. According to Fentaye (2015) Ethiopia is one of developing countries characterized by high import intensity of the economy, limited capacity to produce capital goods, low levels of domestic savings and limited capacity to generate foreign exchange and make the development effort in Ethiopian is beyond domestic capacity. Thus, all of the above mentioned factors lead the country to relay the huge inflow of foreign aid to mobilize countries economy (Fentaye, 2015).

In general most poor countries have inadequate levels of savings and foreign aid can supplement domestic savings, which could be directed to investment. In this case we assume that all foreign aid will be allocated for investment purposes. In reality this is not the case especially for the poor African countries; aid is also given for humanitarian causes. Poor countries also have insufficient export earnings required to import capital goods for investment. It is thus assumed that the foreign aid will assist those countries to fill this gap, thus supplementing export earnings required to import capital goods (Mallik, 2008).

Taking this into considerations, in the next section we will review different literatures related to the relationship between aid and economic growth in Ethiopia. As stated in the different sections of this paper as that of relationship between budget deficit and economic growth,

there is a big controversy regarding the direction of relationship between foreign aid and economic growth.

2.1.6. Relationship between aid and economic Growth

One of the most controversial debates in the empirical growth literature with big policy implications is whether foreign aid is beneficial to a country's economic growth or not. For instances, Veiderpass and Andersson (2007) expressed the relationship between foreign aid and economic growth and efficiency as debatable and but still no consensus is found among researchers and policy makers with his paper titled Foreign aid, economic growth and efficiency development. At the end of their paper they were not found clear pattern; they concluded their paper with controversy.

One of the best-known attempts to assess the impact of aid on growth is by Burnside and Dollar (2000). The study shows that aid has positive effects on growth in the good policy environment, while it does not work in a distorted environment. Good policy environments, according to Burnside and Dollar, are those that are open to trade, have low inflation rates, good share of the budget surplus in relation to GDP (lower budget deficit) and balanced government consumption in GDP (Haile Girma, 2015). Burnside and Dollar, thus found that aid significantly increased growth in good policy environments as measured by a composite measure of macroeconomic policies, had no effect in average environments, and was actually damaging in bad policy environments.

In previous studies, attention was given to the nexus between foreign aid and economic growth to a larger extent, putting aside other potential factors accounting for efficient utilization of foreign aid. For instances, the two-gap theory stressed on the importance of foreign aid in promoting domestic saving and foreign exchange shortages towards capital formation and economic growth (Kitessa, 2018). He added, for the economies of developing countries characterized by vicious circle of poverty, the rationale for foreign aid is very straight forward. Basically, the key factor working behind seeking foreign aid is capital constraint. In view of that, there are three gap models radiating from the Harrod-Domar growth models (Harrod, 1948; Domar, 1947) on why foreign aid is necessitated. The saving gap model is the first gap that assumes excess supply of labour constrained by lack of capital. This shortage of capita arises from low domestic saving (constrained saving) which in turn

leads to low income incapable of generating adequate amount of capital that helps to achieve the targeted growth rate. The second gap model is the foreign exchange gap where developing countries are constrained by shortage of hard currency to meet the demand for imported capital goods. Here, revenue obtained from export of goods and services is by far less than the amount of payments needed for imported capitals goods used for investment purposes. Thus, such foreign exchange gap is filled by the foreign aid (Kitessa, 2018).

The third gap model is the fiscal gap model where developing countries are unable to collect sufficient amount of revenue to achieve targeted investment and growth rate. But majority of the studies focus on the first gap model, that is, the saving gap model, leaving the other two gap models. In general, in countries like Ethiopia where there is significant resource gap, the flow of foreign aid must fill the aforementioned gaps. Keeping the importance of foreign aid in the form of capital inflow as it is, the key issue is whether such capital inflow is effective enough to bring the intended results. Thus, the issue of aid effectiveness is the most contested debate in the recent theories of aid and other macroeconomic variables relations in general and aid and saving relations in particular. For example, the most stubborn paradox called the macro-micro paradox of foreign aid-saving relations states the aid-saving relationships at micro level showed the positive impact of aid and contradicts with the aid-saving relationships at macro level that showed no clarity on the impact of aid (Kitessa, 2018).

2.2. Empirical Literature

2.2.1. Empirical literature of the relationship between budget deficit and economic growth

Epaphra (2017) examined the causal relationship between budget deficits and macroeconomic fundamentals namely real GDP growth rate, the rate of inflation, interest rate, money supply and real exchange rate in Tanzania. The researcher used time series data covering from 1966 to 2015. The result of their study confirms that there is negative relationship between budget deficit and economic growth. Thus, GDP is negatively related to budget deficit according to him. They finalize that, By contrast, budget deficits, and the rate of inflation and money supply are positively associated.

Nikoloski and Nedanovski (2017) conducted research on related issues using an analysis of variance (ANOVA) model and concluded that budget deficit is inversely proportional to the rate of economic growth. They added, reducing the budget deficit by 1 percentage point

would cause an increase in the growth rate of GDP by 0.35 percentage points. The impact of the budget deficit on the rate of economic growth is relatively low, suggesting that the economic growth of Republic of Macedonia is affected by other important determinants. According to them, the conclusion is that fiscal policy can have an impact on economic growth in the long term. Their main findings indicate that on long term, the expenditure side of the budget has primary impact on the growth of the economy namely; the size of the government spending has a negative effect on economic growth as opposed to public investments that have a positive impact. They also found evidences that direct taxes on the revenue side of the budget have negative effects on economic growth. This effect arises from the taxation of labour, which could lead to pressure on wages. Thus, they concluded, this causality between economic growth and budget deficit arises from the fact that the positive economic growth generates additional public resources.

Thanh (2018) found that the fiscal deficit had a negative effect on economic growth in Vietnam both in short run and long run. According to him, fiscal deficit also has a damaging effect on private investment, foreign direct as well as net exports. The result confirmed that fiscal deficit can hurt output and some important macro sectors including investment flows and net exports. Based on the result obtained the researcher concluded that factors like private investment, foreign direct investment, and international trade have very important roles in promoting the economic growth in Vietnam.

Fatima, et.al (2012) investigated the nexus between budget deficit and economic growth using an application of unit root test and OLS model using home country dataset of budget deficit and output growth for the period 1978 to 2009 and found the negative impact of budget deficit on the economic growth. According to them, the negative relationship is because of government's shortage of resources to meet their expenses in the long run. They suggested that, poor countries savings as well as revenues are not enough to meet their expenses. The other variables they included in the model also affect the economic growth, i.e. inflation has a negative impact on GDP, and an increase in inflation also affect the interest rate, which is another variable, which affects the economic growth. They finally concluded that, the governments must take measures to control the deficit to achieve certain level of the economic growth.

Haideret.al (2013) made research on the same study area (relationship between budget deficit and economic growth) and finds that there is significant impact of budget deficit on GDP of Bangladesh for the time period of 2000-2012. They found that more specifically, budget deficit shows a significant negative impact on the GDP using the VAR model estimation. Other variable's impact on GDP from the VAR model suggests positive relation with inflation and exchange rate where the relation with unemployment is negative. Using the co-integration tests, it had been found that there are at-least three co-integrating series (i.e. budget deficit, inflation and exchange rate) with 1% level of significance.

Eminer (2015) was another researcher who made investigation on the nexus between budget deficit and economic growth using annual time series secondary data covers the period of 1983-2010 (28 years) and concluded that his findings are similar to most of the Keynesian approach literature except the significant causal relationship between non-productive expenditure and economic growth. But as it is explained before North Cyprus has a different characteristic compare to other small economies. Isolations have a negative impact on private investment and this makes government investment and other spending important revenue source for the economy. He finally recommended that, as foreign aid has an important share in the budget revenues of North Cyprus it would be beneficial to analyze and see the impact of financial aid on growth.

Teshome (2006) studied the impact of government spending on economic growth: the case of Ethiopia. In his study both qualitative approach and econometric analysis are employed to investigate impact of government spending along the three distinct regimes (imperial, derg and post 1991) because spending policies and performances are largely correlated with distinct nature of these regimes. Finally he finds that, in the cointegration analysis it is found that there is single cointegrating vector and this implies that there is long-run relationships among the variables. The long run result shows that expenditure on human capital has a very significant positive impact on growth of real GDP. Besides, private consumption has significant positive impact on economic growth. Government investment expenditure is not significant and the sign of its coefficient is also negative, which probably reflects the inefficient and poor quality nature of public investment.

Negash, (2014) investigated the relationship between budget deficit and the main objective of his study was to provide empirical evidences for causal long-term relationship between budget deficit, broad money supply and inflation in Ethiopia. The Author employed co-

integrated VAR or vector error correction (VEC) model approach by using annual time series data over 1975-2012. The results show that positive causal relationship between money supply and inflation both in the short and long run. He added budget deficit affects both money supply and inflation in the long run. However, this is not conclusive by taking into account granger causality test. But both money supply and inflation do not Granger cause government budget deficit.

Ermias (2018) investigated the nexus between budget deficit and economic growth using empirical analysis is based on secondary time series data from 1975/76 up to 2015/16 using VAR approach. Thus the Author founds the presence of long run positive and significant relation between two variables in act. Ermias2018 added that, the relationship between budget deficit and economic growth in Ethiopia holds the Keynesian view both in the short run and long run revealing that, the existence of positive relations between budget deficit and economic growth in Ethiopia (Ermias, 2018). Generally, it is possible to conclude that the Ethiopian case is also the same with other countries literate regarding the controversy between aid and economic growth and budget deficit and economic growth.

Teamrat (2018) investigated the relationship between budget deficit and economic growth using secondary data covering from period 1976 to 2015. The data were collected from the National Bank of Ethiopia (NBE). The author have changed the data for current account and budget deficit into positive, current account (CA), budget deficit (BD), real gross domestic product (RGDP) and real effective exchange rate index (REERI) have been transformed into natural logarithms, just for the purpose of removing possible heteroscedasticity and capturing non-linear properties. To determine this long run and short run relationship among the dependent and independent variables the Author applied the vector error correction model (VECM). Using the above mentioned mechanisms, the Author founds that; current account deficit can be used to forecast budget deficit and vice-versa. On the other hand, there is one directional relationship. Real GDP and real effective exchange rate Granger causes current account deficit at 1% and 5% levels of significance respectively.

The most recent study conducted on the issue in Ethiopia is most probably made by Endashaw (2020). The researcher tried to investigate the relation between budget deficit and economic growth. Regarding to this, the researcher is focus to see the relation between budget deficit and economic growth in Ethiopia from the period of 1974/75 to 2019/2020. Under his study the researcher used Autoregressive distributed lag and vector autoregressive

model to see the long run, short run relationship and causality of budget deficit and economic growth. Finally the Author finds that there is long run positive relationship between budget deficit and economic growth, which is consistent from Keynesians School. Moreover negative relationship between external debt and budget deficit is recorded. The impact of inflation rate and tax revenue is insignificant in both long run and short run. In short run both external debt and economic growth has negative relationship which assert the Freidman and neo-classical paradigm.

Based on the above empirical literatures the relationship between budget deficit and economic growth is controversial. As that of three schools of thought Neo-classical, Keynesians and Recardians put different conclusions; all of empirical literatures I referred confirmed the same. The relationship between budget deficit and economic growth is based on the types of activities the budget spend. This means of budget deficit is occurred due to high investments on productivity of the country the relationship become positive. However, if the budget deficit comes from bad activities such as corruption and unplanned activities, the relationship became positive. Most of the researches I investigated used Inflation, Real Interest Rate, real exchange rate and growth capital formation as explanatory variables. This means budget deficit can affect the economy through the above mentioned variables. Whether it is negative or positive budget deficit affect the above mentioned variables and the above mentioned items in turns affect economic growth of the country negatively or positively.

2.2.2. Empirical literature of relationship between aid and economic growth

Yiew and Lau (2018) investigated the impact of foreign aid on economic growth using data for 95 developing countries from the years of 2005 through 2013 and according to their result; the relationship presented a U-shape between foreign aid and economic growth. Moreover, they found positive relationship between the population and foreign direct investment on economic growth. They found results strongly support the view that both FDI and POP to be more important determinants of GDP, implying that GDP is less likely depends on ODA.

On 2005 Moreira investigated the relationship between aid and growth with research using Cross-country growth regressions carried out until the mid-nineties were at the core of the analysis. The author finds that there is positive relationship between aid and economic growth in developing countries. Based on this finding, the researcher states that, the method

rather than the theoretical basis is the main problem inherent in the assessments being carried out up to the mid-nineties. This means the effect of aid on economic growth may depend on the ways it is implemented to economic activities.

Mallik (2008) investigated the relationship between foreign aid and economic growth using a Cointegration Analysis of the Six Poorest African Countries. The study showed that in five out of the six countries, the natural log of foreign aid as a percentage of real GDP has a significant negative long run effect on the natural log of real GDP per capita. His findings confirmed that in the short run aid growth has no significant effect on economic growth per capita for most of the countries except for Niger. These negative results appear on the surface to indicate the long-term harmful effect of international aid on living standards in these countries. He added that, aid will work differently for different countries compared to countries with better institutions and higher levels of human resources. It also seems likely that a significant amount of aid to these countries meets humanitarian needs rather than expanding the productive capacity of the economy.

Haile (2012) in his study on The impact of foreign aid on economic growth: Empirical evidence from Ethiopia (1974-2011) using ARDL approach concluded his finding with foreign aid has negative contribution on RGDP growth both in short run and long run period in Ethiopia disproving the first hypothesis of the study. He added, in the long run and short run on average, a one percentage increase in the aid-to-RGDP ratio leads to a decrease in RGDP growth by about 0.65 % and 0.28% respectively, other variables being constant. Moreover, he suggested that, Foreign aid interacted with policy index has positive coefficient showing that the effectiveness of aid depends on macroeconomic policy.

Fentaye (2015) made investigation on The Impact of Foreign Aid on Economic Growth of Ethiopia using Harrod-domer model and found that aid contributed positively to economic growth in the long run, but its short run effect appeared insignificant indicating that most of the aid has been used to finance investment which has a long development period. The author suggested aid as, effective in promoting growth in Ethiopia in the period considered. However, its effectiveness would have been higher if it was supported by a sound macroeconomic policy environment.

Tasew (2011) studied the relationship between foreign aid and economic growth in Ethiopia and founds that there is positive relationship between aid and economic growth in long run and insignificant relationship between two variables in short run. The Author concluded that, when aid is interrelated with policy, the growth impact of aid is negative implying the harmful impact of bad policies on growth in the long run. The overall finding is that the growth impact of aid is negative due to the presence of deprived policy environment in the country. Aid squared, unlike the theoretical view, has got a positive sign according to the Author which implies the absence of capacity constraint in the flow of aid to Ethiopia. Finally, the author concluded that, foreign aid is important to enhance investments and growth in Ethiopia despite contributing less due to disapproving policies. However, in the long run, rather than just satisfying gaps, aid must help close gaps in Ethiopia, since reliance on future aid and foreign borrowing is must diminished.

Yohannes (2011) investigated the relationship between aid and economic growth in Ethiopia. For the purpose of analyzing the impact of foreign aid on the economic growth through its transmission mechanism, the Author used secondary data source, from 1970/01 to 2008/9. The author puts on its study that he used data sources for the problem under investigation are publications of National Bank of Ethiopia (NBE), Ministry of Finance and Economic Development (MoFED) and Central statistics Authority (CSA) of Ethiopia. In addition to this international data from international organizations like IMF CD-ROM and WB CD-ROM collected for conducting the research. For conducting its study four models have specified and estimated by using Vector Autoregressive (VAR) model. Finally, the cointegration test result indicates the existence of long run relationship among the variables entered in all models. In the long run foreign aid has a positive and significant impact on growth through its significant contribution to investment and import. However, according to him, the dynamic short run model points out that aid to have a significant impact on growth it has to be assisted by good monetary, fiscal and trade policy. In addition, in the short run aid has significant impact on government consumption expenditure, which confirms the existence of aid fungibility. The study also confirms the existence of debt overhang problem in the Ethiopian economy.

Kitessa (2018) was one of researchers who made investigation on the relationship between foreign aid and economic growth. The author main research question was to address drivers of economic growth in Ethiopia using the time series data from 1970 to 2016. The study

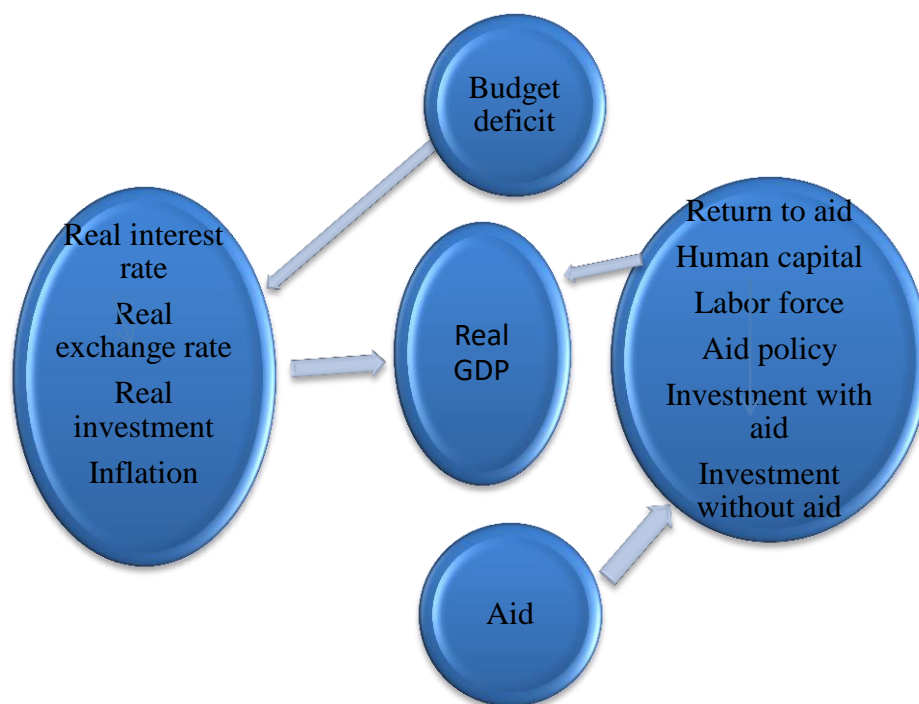
analyzed the time series property of the data (test of the unit root on each variable), test of cointegration to assess long run relationship of economic growth and its explanatory variables and vector error correction model (VECM) was used to estimate the short dynamics of the growth equation. Finally the Author finds that there is long run relationship among the variables entered in the per capita growth equation. He added, In the long run, foreign aid inflow entered alone has a positive and significant impact on economic growth. Again, aid interacted with policy appears to have a positive contribution showing that both aid and policy are complementary to each other.

So as stated above, the relationship between aid and economic growth is the most controversial issue in the world of economics. Most of study conducted in Ethiopia regarding the raised issues indicated that, the relationship between aid and economic growth is positive in the long run. However, the short run effect between the two variables is probably insignificant. All of researches conducted on the same research used time series data to reach on conclusion. The author learned that one of the most critical thing on which aid effectiveness depends is its implementation. If there is good policy in certain country the aid will be effective and will bring the planned growth otherwise it will be debt for the country in different ways. The effectiveness of aid can be realized on variables include increased investment, in physical and human capital; increased capacity to import capital goods or technology; lack of indirect effects that reduce investment or savings rates; and transfer of technology that increases the productivity of capital and promotes endogenous technical change and finally on GDP of the country. If the foreign aid collected from different countries make positive difference on above mentioned variables it is possible to say there is positive relationship between aid and growth. Generally, it is better to conclude that the effectiveness of aid will be based on the institutional structure of the country. Thus, if the aid received is appropriately used for intended purposes the aid collected from different countries become effective and supports the economic growth of the country.

2.3. Conceptual Framework of the study

The research has the following conceptual framework. Thus it is clear that, if budget deficit is financed through borrowing from commercial banks there will be an increase in interest rates, which leads to crowding out of private investments. The other option will be financing budget deficit through creation or borrowing from the central bank (monetary financing) and

this method leads to inflation according to Epaphra (2017). Epaphra (2017) added that Financing deficit by externally borrowed funds will results in the appreciation of the exchange rate resulting from the inflow of foreign exchange which will affect the performance of exports leading to the worsening of the current account balance which leads the country to growth in the country’s external debt stock and result in a debt crisis Epaphra (2017).In macro-economic theory, a rise in gross capital formation should contribute towards higher aggregate demand (AD) and also increase productive capacity (LRAS). Increasing investment should lead to higher fiscal deficits and there by economic growth in the long-term (though it depends on how effective the investment is. Conversely, inter temporal volatility of real exchange rate may have counter negative or positive impact on budget deficit (Ermias2018). The conceptual relationship between aid and economic growth will be explained in third chapter of the paper during selection of variables. Generally, the conceptual framework of the impact of budget deficit and aid on economic growth can be explained though the following diagram.



Source: own development from different literatures.

Figure 2.1: conceptual framework of the relationship between budget deficit and aid economic growth.

3. RESEARCH METHEDODOLOGY

3.1. Research Design

The researcher will use longitudinal research design to conduct this research. In comparison to cross-sectional designs, which measure subjects at one point in time, longitudinal research designs, by definition, involve repeated measurement over time of one or more groups of subjects. The major advantage of a longitudinal research design is the ability to study the natural history and course of development of a phenomenon. Longitudinal research can also provide information about the time ordering of different events, which can be useful in determining causal relationships between variables. The real strength of longitudinal design is the ability to measure the patterns and parameters of delinquent and criminal behavior, which allows examination of causal effects. In the study, longitudinal research designs describe patterns of change and help establish the direction and magnitude of causal relationships. Measurements are taken on each variable over two or more distinct time periods. This allows the researcher to measure change in variables over time.

3.2. Types of Data, sources and method of data collections

The study will be made on secondary time series data starting from 1991 up to 2018/2019. Domestic sources of data will be used from data base of MoFED, NBE and other government budget and aid related associations and data were accessed through both direct contacts with the concerned officials and from their official websites. The data on some variables may not fit the variables to be investigated which will be converted them into the appropriate mathematical form by the researcher. The empirical analysis will be based on secondary time series data from 1991 up to 2018/19.

3.3. Methods of Data Analysis

As stated above the study will use both descriptive and econometrics method of analysis. Descriptive statistics (frequencies, percentages, mean, and standard deviation) will be used. Data will be cleaned and organized using SPSS while analysis will be done using STATA. In addition to these, it will be analyzed properly by using the output of vector autoregressive (VAR) model and Harrod-Domar growth model for the nexus between budget deficit, aid and economic growth in Ethiopia. The regression analyses would be conducted to determine to what extent the independent variables explain the dependent variable. Correlation analysis

will be conducted to test the proposed hypothesis whether there is a positive significant relationship between the dependent variable and the independent variable.

3.4. Econometric Model Selection

Due to insufficient macroeconomic theories linking the below variables, the real GDP (RGDP) was not functionally explained by the explanatory variables on the right hand side of the equation 1. Hence it was not possible to directly estimate this equation using the Ordinary Least Squares (OLS) technique. This prompted the use of Vector Auto regressions (VARs) method. This was because VAR model is a theory-free method used for the estimation of economic relationships (Sims, 1980). This methodology was based on a reaction against the traditional econometric approach to tackling multi- equation simultaneous models (Thomas, 1997). Thus it is an alternative to the incredible identification restrictions in structural models.

Vector Auto regression (VAR) captured the evolution and the interdependencies between multiple time series, generalizing the uni-variate Auto Regressive (AR) models (Stock and Watson, 2001). All the variables in a VAR were treated symmetrically by including an equation explaining evolution of each variable based on its own lags and the lags of all the other variables in the model. In other words, VAR econometrics analysis involved the estimation of regression equations in which the current value of each variable was expressed as a function of lagged values of itself and each of the selected variables (Sims, 1980). No variable was assumed to be exogenous a priori and no variable was excluded from the autoregressive equation for any of the variables in the system. The use of structural VAR was justified because of the possibility to simulate the response over time of any variable in a set to either an own disturbance or a disturbance to any other variable in a system of equations (Stock and Watson, 2001). A structural VAR was used to examine the interrelationships among a set of economic variables, and analyze the dynamic impact of random disturbances on the system of variables in this study. In the framework each variable, whether measured at levels or first differences, was treated symmetrically hence all variables in the system contained the same set of regressors (McCoy, 1997). There were no exogenous variables and no identifying restrictions. The only role for economic theory was in specifying the variables to be included. The structural VAR estimated the structural coefficients by imposing contemporaneous structural restrictions based on economic theory.

The vector autoregressive (VAR) approach will be used as appropriate to examine the relationship between budget deficit and macro-economic variables. Vector auto regression (VAR) is a stochastic process model used to capture the linear interdependencies among multiple time series. VAR models generalize the univariate autoregressive model (AR model) by allowing for more than one evolving variable.

Explanatory variables that will be included will be the natural logarithm of real GDP, budget deficit as percentage of GDP, government expenditure as a percentage of GDP, real interest rate, inflation and real exchange rate. The author will use the model developed by Shojai (1999) in measuring the relationship between budget deficit and economic growth to assess the effects of budget deficit on the economic growth (GDP) and diagnostic tests will be applied to ensure the fulfillment of the assumptions thereof. Ermias (2018) used the same model to measure the nexus between budget deficit and economic growth for his time series data starting from 1975/76 up to 2015/16.

The post estimation tests like absence or presence of serial auto correlations, normality distribution test, heteroscedasticity (homoscedasticity) are very important diagnostic tests that will be checked. Moreover, parameter stability diagnostics to examine the stability and predictive position of both dependent and explanatory variables included in the model, AR root test will be verified.

The mathematical expression of the model in real terms is as follows:

$$GDP = f(INFL, RIR, RECX, BD, GCF)..... (1)$$

All the variables in the mathematical expression will hold a real value.

In (2) and (3) below expressions show the linear multiple regression models and then the transformed model in natural logarithm form demonstrated.

$$4. GDP_t = \beta_0 + \beta_1 INFL_t + \beta_2 RBD_t + \beta_3 RIR_t + \beta_4 RECX_t + \beta_5 GCF_t + \beta_6 GDP_{t-1} + u..... (2)$$

$$\ln RGDP = \beta_0 + \beta_1 (\ln INF) + \beta_2 (\ln RBD) + \beta_3 (\ln RIR) + \beta_4 (\ln RECX) + \beta_5 (\ln GCF) + \beta_6 (\ln GDP_{t-1}) + u..... (3)$$

The researcher will use another model to investigate the relationship between aid and economic growth in Ethiopia. As I stated in limitation part of chapter one, one of the problems of the aid-growth relationship are based on cross country regressions is that, most studies which lump together countries of heterogeneous characteristics and size. There are

very few studies of the poorest African countries that examine the issue using single country time series data.

Earlier models for the determination of the aid-growth link were based on the Harrod-Domar growth model which was used by Mallik (2008) to investigate Foreign Aid and Economic Growth: A Cointegration Analysis of the Six Poorest African Countries. According to Mallik (2008), models assume that there is an excess of supply of labour, and the only constraint of growth is the availability and productivity of capital. Three gaps were identified as constraints to growth, which are needed to be filled by foreign aid to enable investment including Savings gap, Trade balance gap and Fiscal gap.

Additionally, Fentaye (2015) tried to use the same model with some modification to investigate The Impact of Foreign Aid on Economic Growth of Ethiopia using time series data from 1974 up to 2013. According to him growth of certain country depends on the level of investment. Thus;

$$g = \kappa / Q \cdot I = \delta I \dots\dots\dots (4)$$

Where δ = incremental capital output ratio,

I = investment level,

Q = output level, and

g = growth rate of output.

However, since the objective of this thesis is to investigate the impact of aid on growth, I will use the model developed by Fentaye 2015 in which attempts are made to include variables to further improve the above model and to be in line with the objective.

Thus, the growth function is given by:

$$RGDP = f (INV_0, AID, PA, HC, LAB, (A)^2) \dots\dots\dots (5)$$

Where, RGDP = Real Gross domestic product

INV₀ = investment level that is not financed by aid

AID = aid as a ratio of GDP

PA = aid policy interaction term

HC = human capital proxied by education expenditure

LAB = labor force as a ratio of total population

Accordingly, the model to be estimated can be specified as follows:

$$\ln RGDP = \beta_0 + \beta_1 \ln INV_0 + \beta_2 \ln AID + \beta_3 \ln PA + \beta_4 \ln HC + \beta_5 \ln LAB + \beta_6 \ln A^2 + \epsilon_i \dots\dots\dots (7)$$

As I stated on the introduction part, Ethiopia is receiving too many aids from different world countries for different purposes including for deficit financing. For instances according to word bank report Ethiopia has received USD 1, 356, 900, 024 at the beginning of 1960. The amount received was increased overtime and received USD 4,732,240,234 at the end of 2018(World Bank, world development indicator, 2020).That's why I used the above model used by Fentaye Setargie (2015) to investigate the effectiveness of received aids for different purposes.

3.6.Research Hypothesis and Definition of Variables

3.6.1. Dependent (explained) variable

For both budget deficit and aid the dependent variable will be RGDP Real Gross Domestic Product or (GDP) is the real value of GDP since the effects of inflation have been netted out. It was measured in birr. It was obtained by deflation of the nominal GDP using the GDP deflator.

3.6.2. Independent (Explanatory Variables)

The researcher will use the following independent variables express in equation 1, 2 and 3 to describe the impact of budget deficit and economic growth in Ethiopia.

INFL = Inflation Rate is the general rise in price level and it is measured by price index. Price index is the cost of the market basket today as a percentage of the cost of that identical basket in the starting year.

RBD = Real Budget Deficit, is the value of government revenues net of its expenditures in one year. It is measured in birr.

RIR = Real Interest Rate is a fee that are charged for borrowing money, expressed as a percentage of the total amount of the loan.

REECX= Real effective exchange rate is the price of a nation's currency in terms of another currency. It has two components, the domestic currency and a foreign currency, and can be quoted either directly or indirectly.

GCF =Gross capital formation is total *investment or real productive assets of the economy which leads to more production.*

u = Stochastic Error Terms while; $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are the respective coefficients of the variables in the developed model.

Explanatory variables stated in equation 4, 5, 6 and 7 will be used to describe the relationship between aid and economic growth in Ethiopia. Those variables include;

Non-aid Financed Investment (INVO): This is the ratio of non-aid financed investment to GDP. According to Fentaye 2015 the variable INVO would be developed by using the technique of generated regressor of Gomannee, Girma, and Morrissey (2005). Aid is used as the only explanatory variable and this variable is constructed representing that part of investment which is not financed by foreign aid. Then INVO is used in place of investment in the growth regression. According to the Author, Aid is affect growth through its effect on investment but, all aid is not intended for investment, and not all investment is financed by aid. Neglecting investment from the growth equation will result in potential omitted variable bias. There will be a problem of double counting (as part of aid is used for investment) If both aid and investment are included and the coefficients are biased (Fentaye 2015).

Using the technique, non-aid financed investment (INVO) is generated as:

$$INVO = I - 0.04AID$$

Where, INVO = investment which is not financed by aid.

I = Total investment as ratio of GDP

AID = Official Development Assistance as ratio of GDP

Official Development Assistance (ODA): Development Assistant Committee defined official development assistance as the ratio of Official Development Assistance (ODA) to GDP. ODA is conceptualized as clean grants and concessional movements from bilateral governments and their agencies as well as multilateral financing agencies to the developing countries at low rates of interest with maturity periods of a long-term nature, all of them containing a grant element of at least 25 % (Fentaye 2015).

A²: This takes into account whether there is diminishing return to aid. This hypothesis assumes that an inflow of aid above a certain threshold level starts to have negative effects.

According to this assumption, diminishing returns to aid happens because of the limited absorptive capacity of recipient countries.

Aid Policy Interaction Term (PA): an interaction between policy indicator (P) and aid (A) which capture the conditional effectiveness of aid on policy (Fentaye 2015). According to him, the growth model is comprised of budget surplus/deficit, openness to trade, inflation, and telephone lines per 1000 people (covering aspects of fiscal, trade, monetary, and infrastructure policy) as an explanatory variable, and the coefficients of these variables are taken from the growth regression to construct the policy indicator. To account for openness to trade in the construction of the policy indicator (OPEN), a standard openness index, $(X + M)/GDP$ this is the ratio of total trade to GDP which is exports plus imports divided by GDP will be used.

The result of the policy indicator obtained according to Fentaye Setargie (2015) is:

$$P_t = -2.9635(BD)_t + 0.1498(OPEN)_t + 0.1288(INF)_t + 2.423(TELE)_t$$

Where, BS/BD: overall budget surplus/deficit excluding grants; this paper will also use inflation as a proxy for monetary policy), OPEN; a standard openness index, $(X + M)/GDP$ (i.e. the ratio of total trade to GDP) where X: total value of goods and services exported; M: total value of goods and services imported; TELE: major telephone lines per 1000 people.

Labor Force (LAB): This represents labor force as a ratio of total population. That is age from 15-64 years as a percentage of total population;

Human Capital (HC): Lucas model suggests that a wide range of growth has treated human capital as a critical factor in determining growth rate of output. Human capital is an important source of long-term growth, either because it is a direct input to research or because of its positive externalities. So, the inclusion of human capital variables in growth models are intended to capture quality differences in the labor force, as non-physical capital investment increases the productivity of the existing labor force (Fentaye, 2015).

Finally, all types of tests will be made on the results obtained both for the relationship between budget deficit and economic growth and aid growth relationship in Ethiopia. Those tests include;

The Unit Root Test: The standard classical methods of estimation which are used in the applied econometric work are based on a set of assumption one of these is that all variables are stationary. For data series to be called as stationary its error term must have zero mean,

constant variance must happen and the covariance between any two time periods depends only on the distance or lag between the two periods and not on the actual time which it is computed. There are several ways of testing the presence of unit root. The most common and popular one is the DF test either its simplicity or its more general nature (Fentaye, 2015).

Co integration Test: according to Fentaye 2015 two approaches may be used in testing for Cointegration. They are: (i) the Engle-Granger (two step algorithm) and: (ii) the Johansen Approach

The Engle-Granger (E-G) method requires that for co-integration to exist, all the variables must be integrated of the same order. Hence, once the variables are found to have the same order of integration, the next step is testing for level of integration. This needs to generate the residual from the estimated static equation and test its stationarity. Although, the Engle-Granger (EG) procedure is easily implemented, it is subject to several limitations. The Johansen (1988) procedure enables estimating and testing for the presence of multiple co integration relationships, in a single step procedure. Moreover, it permits to estimate the model without priory restricting the variables as endogenous and exogenous. Under this procedure, the variables of the model are represented by a vector of potentially endogenous variables. Therefore, this paper will use the Johansen maximum Likelihood Procedure since it addresses the weakness of the E-G method. Ermias, 2018, also used the same mechanism to investigate the relationship between budget deficit and economic growth in Ethiopia. Co-integration analysis helps to identify the long-run economic relationships between the variables. The trace and maximal Eigen value tests will be used to determine the number of co-integrating vectors and the presence of co-integration Ermias(2018).

Vector Error Correction Model (VECM): Economic variables have short run behavior that can be captured through dynamic modeling Fentaye (2015). If there is long run relationship among the variables, an error correction model can be formulated that portray both the dynamic and long run interaction between the variables. In the previous discussion, it was shown that if two variables that are non-stationary in levels have a stationary linear combination then the two variables are co integrated. Co integration means the presence of error correcting representation. That is, any deviation from the equilibrium point will revert back to its long run path. Therefore, an ECM depicts both the short run and long run behavior of a system (Fentaye2015).

VAR Diagnostic Tests: Once the VAR models are estimated we should make some diagnostic tests which are important in order to make sure that the results obtained from VAR estimation can be used for forecasting or policy purposes Fentaye(2015). These post estimation tests are mostly performed on the residual of the VAR and they include: the LM test for residual Autocorrelation, Jarque-Bera test for residual multivariate normality, test for VAR stability and White test for the presence of heteroscedasticity in the VAR's residuals.

Residual Vector Normality Test: Fentaye (2015) used the Jarque-Bera normality test to determine whether the regression errors are normally distributed. The same model will be used with the research to be conducted.

Stability Test: the test for stability checks whether the roots of the characteristic polynomial lies inside the unit circle. If all roots lie inside the unit circle then the VAR is considered as stable and can be used for policy analysis. I can make use of variance decomposition and impulse response functions in our analysis if the VAR is stable.

4. RESULTS AND DISCUSSIONS

This chapter describes the analysis of data followed by a discussion of the research findings. The findings relate to the research questions that guided the study. Data were analyzed to identify, describe and explore the relationship between budget deficit, aid and economic growth. Data were obtained from different government organization like NBE and MoFED. The collected data was secondary time series data. This chapter contains descriptive analysis of data received from above mentioned organizations. Econometric analysis is the second section of this chapter and there will be pre estimation and post estimation tests under econometric analysis part. The researcher made descriptive analysis and put the trend of economic growth and variables included in the impact of budget deficit and economic growth and the impact of aid on economic growth. After doing so, all variables are econometric analysis were made. Before econometric estimation pre estimation tests and after econometric estimation post estimation tests were conducted. Based on the result of the estimation the researcher made discussion and interpretation and each interpretation is compared with other researchers' results.

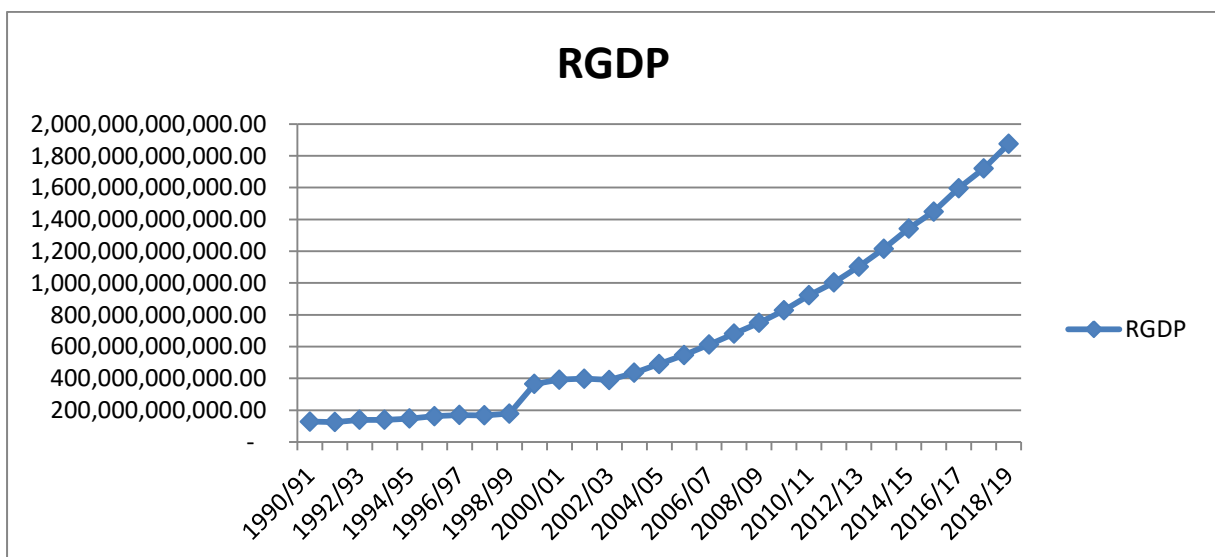
4.1.Descriptive analysis

4.1.1. GDP growth trends

Economic performance in Ethiopia is extremely interrelated with the political process of the country. Ethiopia's history is full of conflicts, drastic policy changes and reversals. Before 1974, the macroeconomic policy was mainly revealed by a market oriented economic system. The period 1974-1991 witnessed a centralized economic system (socialism), where the state played a significant role in all aspects of economic activity. The post Derg period (since 1991) took the economy back to the market oriented system of the imperial regime. According to data received from National bank of Ethiopia, Ethiopia's RGDP is increasing, even though there was small ups and down at certain time, from 1990/91 up to the end of 2019.

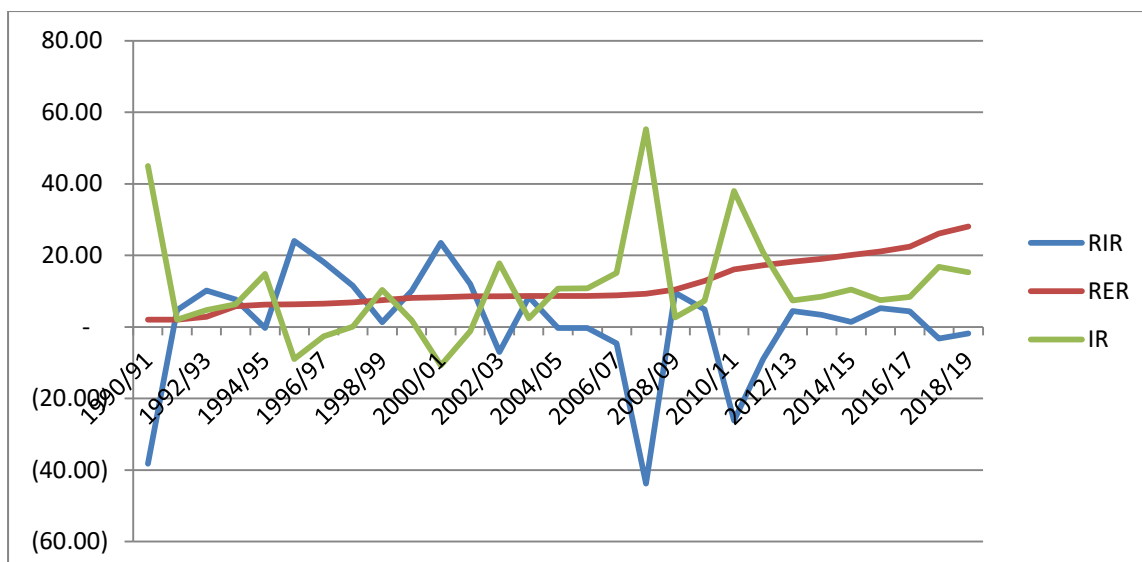
Real GDP growth slowed to an estimated 7.4% in 2019 from 7.7% in 2018, caused by social unrest and fiscal consolidation to stabilize the public debt. On the supply side, industry and services continued to lead growth in 2019. Industry was driven by construction, notably for industrial parks and infrastructure investments. Structural transformation is under way but needs to accelerate. While agriculture's share in GDP has fallen, the sector still employs more

than 70% of Ethiopia’s workforce. Manufacturing accounts for less than 10% of GDP. On the demand side, private consumption and domestic investment were the primary growth drivers in 2019, but domestic investment slowed, reflecting fiscal consolidation. Monetary policy was tight. But inflation remained in double digits in 2019 and above the 8% central bank target because of central bank advances to finance the fiscal deficit. Ethiopia’s managed float exchange rate foresees a 5%–6% annual depreciation to adjust for inflation differentials with trading partners. High inflation has, however, contributed to overvaluation of the Ethiopian birr despite the 15% devaluation in 2017, necessitating a gradual shift to a more competitive exchange rate. Fiscal consolidation has ensured low and stable fiscal deficits, despite a low tax–GDP ratio, averaging 11% during 2016–19. Tax reforms are under way to boost revenue mobilization, but deficit financing through central bank advances has fueled inflation and reduced monetary policy effectiveness. Current account deficits have stabilized because of the phased reduction of import-intensive capital projects— in line with the government’s strategy of reducing external borrowing— and been partly offset by official and private transfers. Ethiopia’s debt sustainability rating deteriorated to high risk in 2018 because of worsening terms of trade and the subsequent weak export performance.



Source: NBE

Figure 4.1: GDP Growth trend



Source: NBE

Figure 4.2: Real interest rate, real exchange rate and inflation of Ethiopia starting from 1990/91-2018/2019.

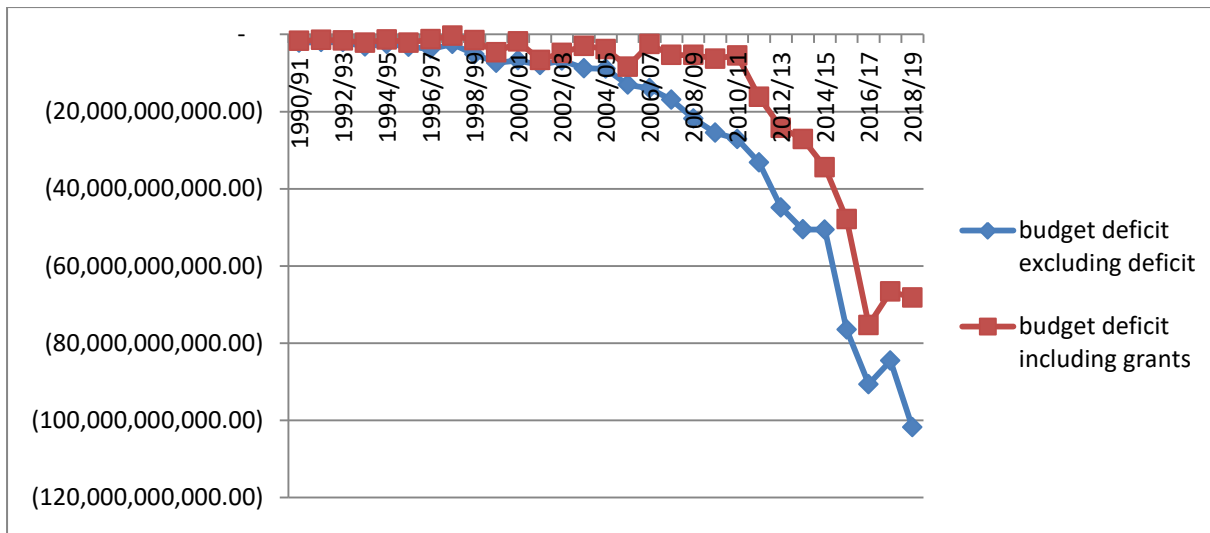
As stated above, the real interest rate and inflation rate of Ethiopia are sometimes negative. For most of history, nominal interest rates, stated rates that borrowers pay on a loan, have been positive, that is, greater than zero. However, consider what happens when the rate of inflation exceeds the return on savings or loans. In such a situation, we say the real interest rate, the nominal rate minus the rate of inflation, is negative (IMF, 2020). Today, there is broad agreement that, in many countries, this neutral interest rate has been on a clear downward trend for decades and is probably lower than previously assumed. But the drivers of this decline are not well understood. Some have emphasized the role of factors like long-term demographic trends (especially the aging societies in advanced economies), weak productivity growth, and the shortage of safe assets. Separately, persistently low inflation in advanced economies, often significantly below their targets or long-term averages, appears to have lowered markets' long-term inflation expectations. The combination of these factors likely explains the striking situation in today's bond markets: not only have long-term interest rates fallen, but in many countries, they are now negative. Returning to monetary policy, central banks cut nominal interest rates aggressively, in many cases to zero or close to zero. We call this the zero lower bound, a point below which some believed that interest rates could not go. But monetary policy affects an economy through similar mechanics both above and below zero. Indeed, negative interest rates also give consumers and businesses an incentive to spend or invest money rather than leave it in their bank accounts, where the value

would be eroded by inflation. Overall, these aggressively low interest rates have probably helped somewhat, where implemented, in stimulating economic activity, though there remain uncertainties about side effects and risks (IMF, 2020).

Deflation can be caused by a combination of different factors, including having a shortage of money in circulation, which increases the value of that money and, in turn, reduces prices; having more goods produced than there is demand for, which means businesses must decrease their prices to get people to buy those goods; not having enough money in circulation, which causes those with money to hold on to it instead of spending it; and having a decreased demand for goods overall, therefore decreasing spending. However, in case Ethiopia, the case of deflation was due to good harvests and significant amounts of food aid inflows. Overall, it is evident that food and non-food inflation behave very differently, indicating that they should be analyzed separately (Josef et.al. 2009)

4.1.2. Budget deficit

Eminer (2015) explained that Economic instability has become common structural problem for many developing countries and budget deficit has to be considered as a main problem for the economy. In addition to this, budget deficit is a common phenomenon for developing countries. As far as Ethiopia is one of developing countries, budget deficit issue is most common problem. For instances, Data received from ministry finance and economic development depicted that Ethiopia is under budget deficit during the period of study. Ethiopia is receiving aids from different world countries for different purposes including for deficit financing. For instances according to world bank report Ethiopia has received USD 1, 356, 900, 024 at the beginning of 1960. Despite receiving aids from different parts of the world, of budget deficit is was not resolved. The following diagrams show the status of deficit of Ethiopia including and excluding grants.



Source: NBE

Figure 4.3: budget deficit Growth Trends

As stated above the country's budget deficit was increasing from time to time. In addition to this, the received aid from different world countries even unable to solve the problem of budget deficit. The countries budget deficit was worsening starting from 2011 and two main reasons can be identified for the consistent government budget deficit. The first is related with the huge government expenditure in the country. It's obvious that the issue of satisfying a society is up to the government. More than ever, since the last two decades, the Ethiopian government has exposed to a sky-scraping disbursement on road construction, health and education sectors. The government gives a great deal of attention and allocated an enormous budget to satisfy the continuing infrastructural demand of the nation. The second reason is rather associated with extremely low government revenue from taxes. The government tax collection performance is too low compared to its spending. This is partly due to the so-called tax evasion and lack of awareness among the citizens that income from taxes is finally used up for public development and partly owing to the low level of development of the nation which in turn influences the tax revenue negatively (Teamrat, 2018).

Generally, from the above figure it is possible to conclude that even though there was high budget deficit in the country during study area, the country's economic growth was encouraging. So it is possible to say that budget deficit has positive impact on economic development of one country other things remains constant.

4.1.3. Expenditure patterns of Ethiopian economy

Ethiopia's remarkable socio-economic transformation over the last decade has been marked by a reorientation of expenditure from recurrent to capital; a significant devolution of resources from Federal Government to Regions; and a clear prioritization of infrastructure spending, while protecting spending on education at four percent of GDP. The Government of Ethiopia has also leveraged external resources to boost spending in pro-poor sectors, particularly health and social protection. As a result, Ethiopia is home to the largest social safety net program in Africa, and has also achieved remarkable health outcomes using cost effective approaches. Recent investments have seen a significant build-up of capital stock, with capital spending at sector level pointing towards increased service capacity. The current public investment-led strategy requires to be complemented by increased budgetary provisions in operations and maintenance so that new investments translate into enhanced service coverage and delivery. As Ethiopia lays the foundation to become a middle income country, and the changing global environment implies declining external assistance, it is imperative that domestic taxation activity support this transition. The current tax-to-GDP ratio is low compared to other neighboring countries, and the tax structure would benefit from increased contributions by direct tax sources. Therefore, there is an immediate need for advancing tax reforms and improves capacity and quality of tax administration. Broadening the tax bases, through review of exemptions, as well as review of tax rates might be venues to consider. Additional revenues will create the much-needed fiscal space to increase funding for operations and maintenance for service delivery, and support fiscal sustainability (WB, 2016).

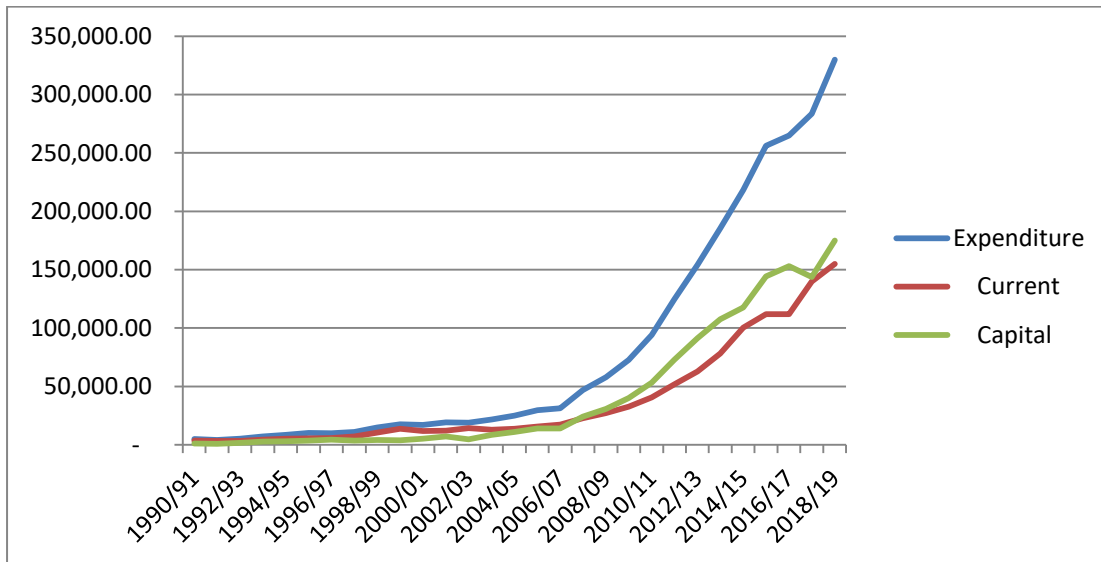
4.1.3.1. Recurrent Expenditures

Recurrent expenditure comprises major sub-group spending like economic services, social services and general/administrative services. The available statistics from National bank of Ethiopia, in 1991, total capital expenditure on economic development activities was Birr 7.190 billion, which has improved to Birr 210.4702 billion in 2018.

4.1.3.2. Capital Expenditures

Under capital expenditures, major economic sectors are economic development, social development and general/administrative. According to data from National bank of Ethiopia, in 1991, total current expenditure on economic development activities was Birr 4.147 billion,

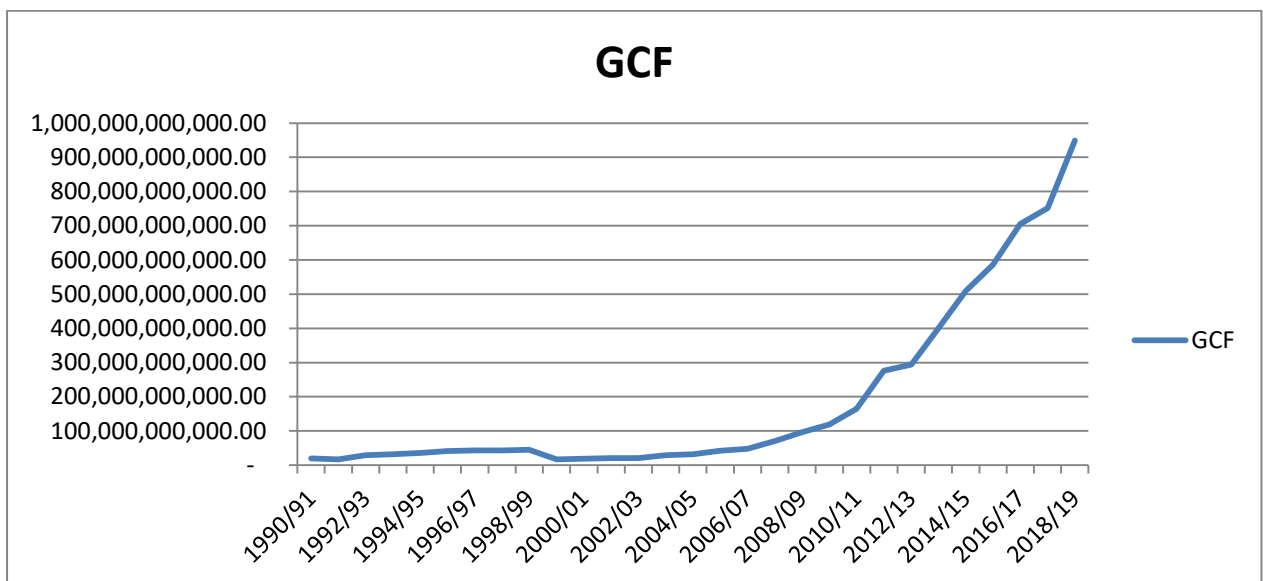
which has improved to Birr 143.7351 billion in 2018. From both recurrent and capital expenditures, we can see that major economic sectors like agriculture, trade, industry, road and communication have been given huge attention. Therefore, having other factors constant, this trend in government expenditure looks supportive for private investment in general.



Source: NBE

Fig 4.4 current and capital expenditure of Ethiopian economy in millions of birr

When we take a look at the trend of capital formation in Ethiopia during the study area the investment was increasing. The following table indicates the progress of capital formation in Ethiopia starting from 1991 to 2019 G.C.



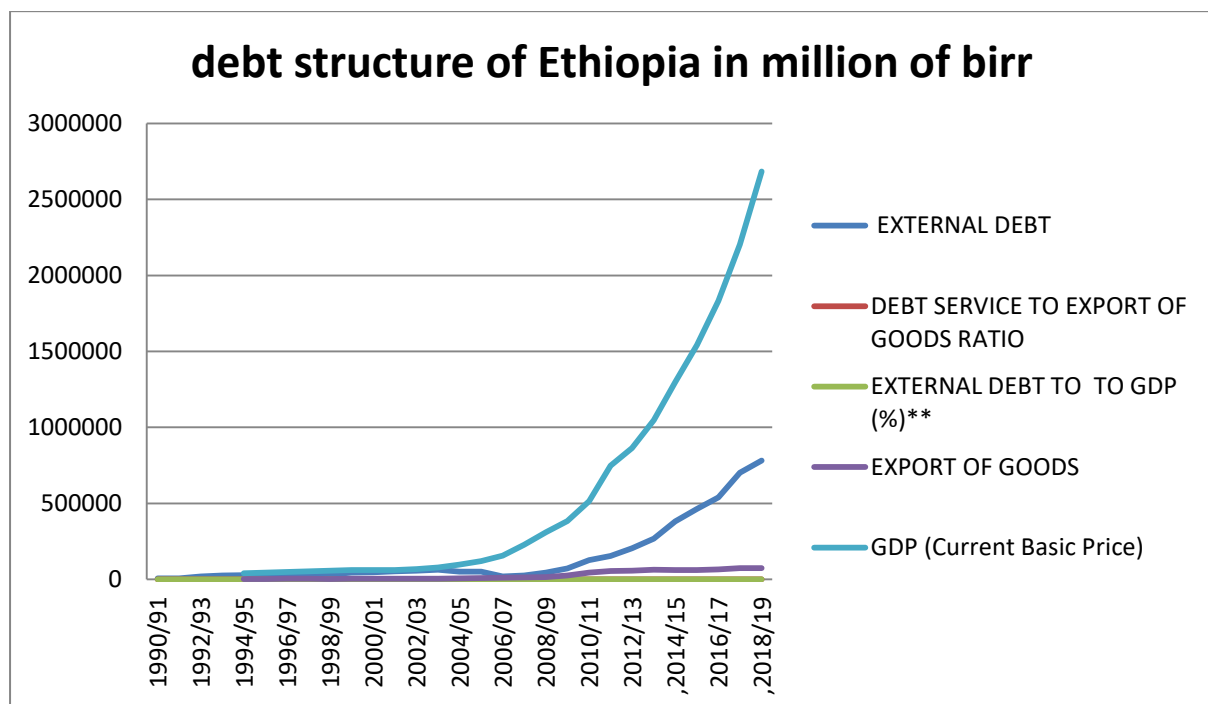
Source: NBE

Figure 4.5: Gross capital formation Growth Trends

According to the above figure the capital formation of the country was increasing from time to time which is one indicator of economic growth of certain country. Investment is one of measurement of economic growth in one country and can be generated from national saving.

4.1.4. Trends of External Debt

Among other things, the frequent change of political and economic reforms made Ethiopia’s external debt has changed significantly in its magnitude, structure and composition over the last four and half decades. The foreign debt of Ethiopia during the period 1992/93-1998/9 grew by 10.41 percent, while the debt service dropped by 25.03 percent. At the same time out of the total outstanding loan, the long term loan, short term loan and IMF credit were 95.5, 4.23 and 0.56 percent respectively (MoFED, 2015). According to the World Bank (1998), Ethiopia’s long term debt increased from 0.17 billion USD in 1970 to 8.84 billion USD in 1991. Moreover, the yearly total debt stock and debt servicing between 1999/00 and 2003/04 was increased by 37 and declined by 28.6 percent respectively. That is, total debt stock from 5.39 billion USD to 7.37 billion USD and debt service from 0.13 billion USD to 0.09 billion USD in 1999/00 and 2003/04 respectively.



Source: NBE

Figure 4.6: debt structure of Ethiopia in millions of birr

The increase in total external debt during this period was attributed to two factors. First, positive transfers from external creditors facilitated sustainable development and poverty reduction program (SDPRP) implementation. Second, currency depreciation, especially USD against EURO, influenced the total debt stock to increase over the reference period. After 2003/04, the country total debt stock decreased from 7.37 billion USD to 4.15 billion USD and debt service declined from 0.093 billion USD to 0.078 billion USD in 2003/04 and 2008/09 respectively.

This huge decline in debt stock and debt service was associated with debt relief obtained especially in 2006, as per the enhanced Highly Indebted Poor Countries (HIPC) initiative. But after 2008/09 the debt stock and debt service shows an increasing trend due to the robust expenditure made by the government. That is, total debt stock increased from 4.15 billion USD in 2008/09 to 8.87 billion USD in 2011/12. Similarly debt servicing of the country surprisingly rose from 0.078 billion USD to 0.39 billion USD in 2008/09 and 2011/12 respectively.

Since the debt relief granted under the Multilateral Debt Relief and Heavily Indebted Poor Countries initiatives (MDRI and HIPC) in 2006, Ethiopia's external debt stock has grown by more than four-fold, as a result of the surge in public enterprises' external borrowings from non-Paris club (particularly China and India) and commercial banks (UNDP, 2016). In 2015/16 the external debt stock rose to USD 24.53 billion from the previous year's level of 2014/15 of USD 19.01 billion and 2013/14 of USD 13.48 billion (MoFED, 2016). The share of GOE external debt from commercial banks rose to 28% in 2012/13 from under 10% in 2007/08 (UNDP, 2014). On the other hand, the share of Paris-club donors shrank to 3.6% in 2012/13 from 4.6% in 2011/12 (Ibid). This may continue in light of the ambitious GTP investment agenda, which may pose risks to Ethiopia's debt rating and hence requires vigilance in debt management to mitigate the risk of debt distress. Any non-concessional borrowing should be consistent with maintaining a low risk of debt distress (Ibid). The latest debt sustainability analyses show that Ethiopia would turn out to be at modest risk of external debt due to the growth in external borrowing. The debt burden indicators are, however, on the rise (IMF, 2016).

Ethiopia's external debt has changed significantly in its magnitude, structure and composition. In the last five years only, external debt has rose by 150%.

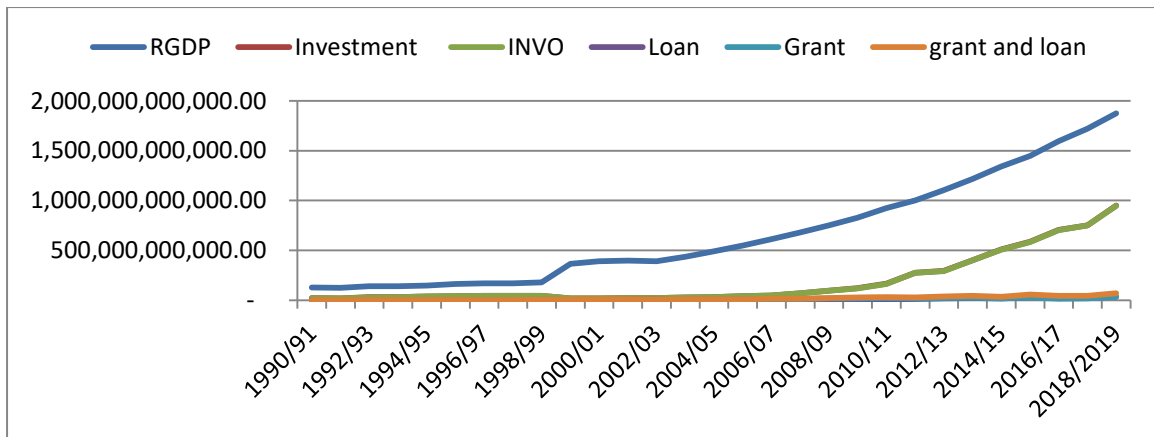
4.1.5. The impact of aid on economic growth

According to data received from National banks of Ethiopia, the aid received from different world countries (bilateral and multilateral) is increasing from time to time during the study time. At the same time variables expected to measure the effectiveness of aids are also increasing. For instances investment without aid and RGDP of the country and total investment in the country is increasing other things remaining constant. This indicates that other thing remaining constant, aid affect growth of the country positively. As discussed in chapter, one mechanism of measuring the effectiveness of aid is through human capital and measuring human capital development is one of most problematic issues. Thus the researcher used expenditures on education as admeasurement of human development. To this end the expenditure on education is also increasing from during the period of study as per data received from MoFED. This is also the indicator of positive impact of foreign aid on economic growth of the country. Aid Policy Interaction Term (PA) which is an interaction between policy indicator (P) and aid (A) which capture the conditional effectiveness of aid on policy. The policy indicator will be developed based on Burnside and Dollar (1997), with minor modifications, out of a regression result obtained from a growth equation. The growth model is comprised of budget surplus/deficit, openness to trade, inflation, and telephone lines per 1000 people (covering aspects of fiscal, trade, monetary, and infrastructure policy) as an explanatory variable, and the coefficients of these variables are taken from the growth regression to construct the policy indicator. To account for openness to trade in the construction of the policy indicator (OPEN), a standard openness index, $(X + M)/GDP$ this is the ratio of total trade to GDP which is exports plus imports divided by GDP was used.

The result of the policy indicator obtained is:

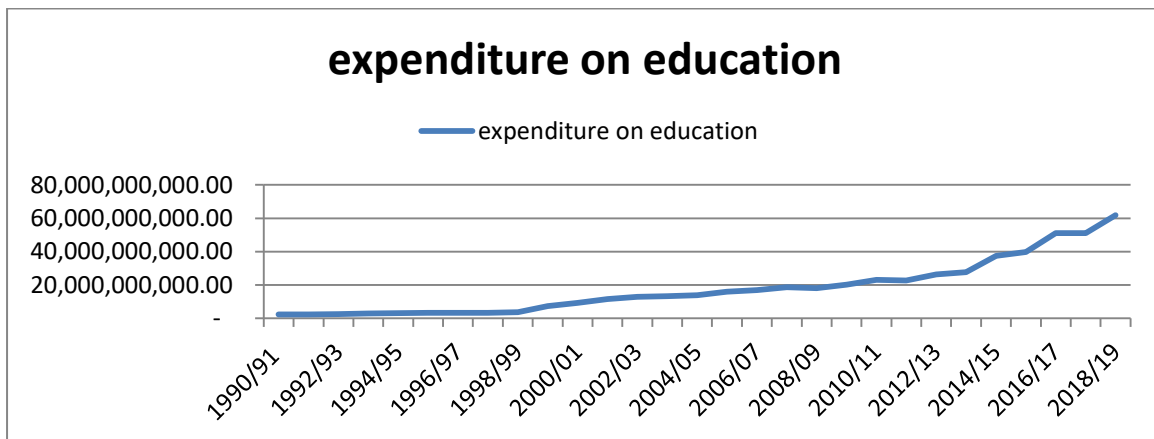
$$P_t = -2.9635(BD)_t + 0.1498(OPEN)_t + 0.1288(INF)_t + 2.423(TELE)_t$$

According to data from national bank of Ethiopia variables included in the policy interaction of the country is increasing.



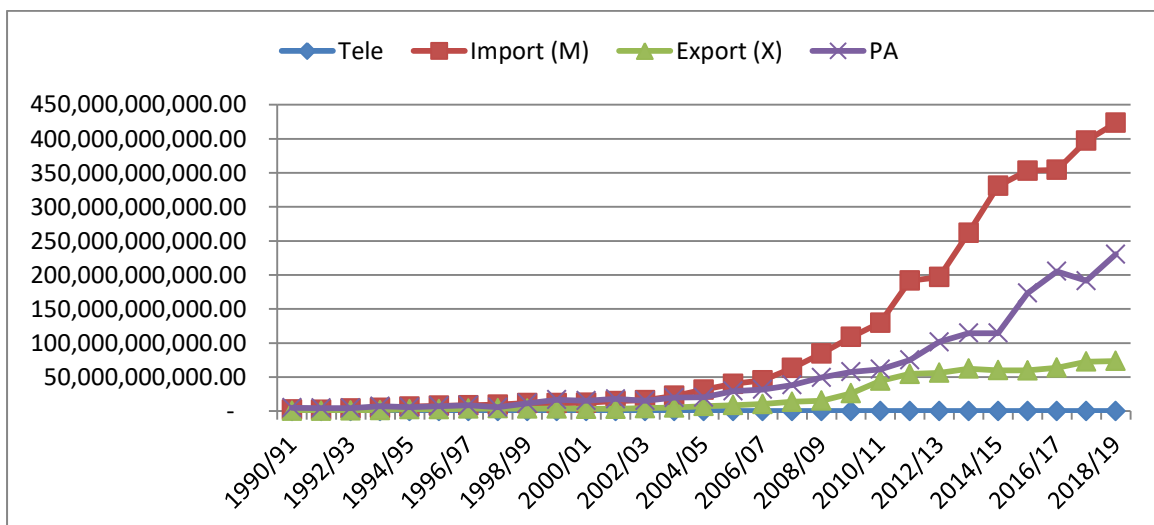
Source: NBE Data

Figure4.7: The impact of aid on economic growth



Source: NBE data

Figure 4.8: Expenditure on education



Source: NBE

Figure 4.9: Aid Policy Interaction Term

4.2. Econometrics model results

4.2.1. Pre estimation Statistics

Before inferring conclusion from estimation results, it is important and vital to undertake some statistical tests. This study tries to take the stationary test as pre estimation statistics to overcome spurious regression and reach at sensible results.

4.2.1.1. Unit root test

Testing for a unit root has become very common in time series econometrics as it is argued that most macroeconomic time series variables are non-stationary due to the reasons that; firstly the persistence of shocks will be infinite, secondly if two variables are trending overtime, a regression of one on the other could have a high R^2 even if the two are totally unrelated which is the case of *spurious regressions*. Moreover, a *spurious regression* has a t -statistics that appears to be significant but the results are without economic meaning, *thirdly* if the variables in the regression model are not stationary, then it can be proved that the standard assumptions for asymptotic analysis will not be valid. Hence, it is very important to know whether or not an economic variable has a unit root (Engle and Granger, 1987; Davidson and Mackinnon, 1999; Phillips and Loretan, 1989).

While there are many tests for unit roots, Wooldridge (2000) suggest that the Dickey-Fuller t test and its extension, the Augmented Dickey-Fuller test - is probably the most popular and easiest to implement. Thus, the Augmented Dickey-Fuller (ADF) test is conducted to check for a unit root for all variables in levels and first differences. The results of this test reveal that the hypothesis of a unit root cannot be rejected for most variables at levels. However, the hypothesis of a unit root is rejected in first differences for most variables, which indicates that most variables are integrated of degree one. The fundamental contribution of this test is to question the validity of the stationary assumptions of classical regression technique in light of the time series property of macro variables. The first step in time series econometric analysis is to carry out unit root test on the variables of interest. The test examines whether the data series is stationary or not. Working with non-stationary variables leads to spurious regression results from which further inference is meaningless. To conduct the test for stationarity of the series, conventional Augmented Dickey-Fuller (ADF) test is used with and without a trend. The null hypothesis in these tests maintains that the series under investigation has unit root. On the other hand, alternative hypothesis claims that the series is stationary. The results of

ADF test obtained by using *stata 14* are depicted on table 4.1. Results of ADF unit root test for the variables, conducted both at level and first difference Table 4: ADF result of unit root test.

Table 4.1 the unit root test for the impact of budget deficit on economic growth at level and after 1st difference

Series	With trend term		With drift term		Inference
	ADF test statistics	Critical value @ 5% level	ADF test Statistics	Critical value @ 5% level	
@level					
Ln RGDP _i	-3.067	-3.592	-0.428	-1.711	Not stationary
Ln GCF _i	-0.934	-4.362	0.441	-1.711	Not stationary
Ln RBD _i	-2.556	-3.5927	-0.242	-1.711	Not stationary
Ln INFL	-3.511	-3.592	-2.839	-1.711	Stationary with D
Ln RIR	-4.146	-3.592	-4.101	-1.711	Stationary with T and D
Ln RER	-4.905	-3.592	-2.346	-1.711	Stationary with T and D
Ln RGDP _{PP}	-3.092	-3.592	-0.196	-1.711	Not stationary
@1st Difference					
Ln RGDP _d	-4.253	-3.596	-4.352	-1.714	I(1)
Ln GCF _d	-2.944	-3.596	-2.554	-1.714	I(1)
Ln RBD _d	-6.302	-3.596	-6.047	-1.714	I(1)
Ln INFL	-3.511	-3.592	-2.839	-1.711	I(1)
Ln RIR	-4.146	-3.592	-4.101	-1.711	I(1)
Ln RER _d	-3.756	-3.592	-3.619	-1.711	I(1)
Ln RDPP _d	-4.237	-3.596	-4.327	-1.714	I(1)

*Stationary with trend term and & drift term

Source: Model output

Table 4.2The unit root test for the impact of aid on economic growth at level and after 1st difference

Series	With trend		With drift		Inference
	ADF test statistics	Critical value @ 5% level	ADF test Statistics	Critical value @ 5% level	
@level					
Ln RGDP	-3.067	-3.592	-0.428	-1.711	Not stationary
Ln ODA	-2.969	-3.592	-1.519	-1.711	Not stationary
Ln INVO	-0.940	-3.592	0.431	-1.711	Non stationary
Ln A2	-3.171	-3.592	-1.806	-1.711	Stationary D
Ln PA	-3.334	-3.592	0.234	-1.711	Not Stationary
Ln HC	-2.007	-3.592	-0.377	-1.711	Not Stationary
Ln LF	-2.675	-3.592	-0.685	-1.711	Not stationary
@1st Difference					
Ln RGDP_d	-4.253	-3.596	-4.352	-1.714	I(1)
Ln ODA_d	-5.829	-3.596	-5.502	-1.714	I(1)
Ln INVO_d	-2.944	-3.596	-2.553	-1.714	I(1)
Ln A2_d	-9.816	-3.592	-5.704	-1.714	I(1)
Ln PA_d	-6.608	-3.596	-6.628	-1.714	I(1)
Ln HC_d	-2.909	-3.596	-2.979	-1.714	I(1)
Ln LF_d	-2.298	-3.596	-2.197	-1.714	I(1)

*Stationary with trend term and & drift term

Source: Model output

The results of unit root test for the impact of budget deficit on economic growth indicates that, most variables are not stationary at level except inflation rate, real interest rate and real exchange rate keeping 5% significance level. The results of unit root test for the impact of aid on economic growth indicates that, most variable is non-stationary except diminishing returns to aid (A^2) keeping 5% significance level. Other variables are found to be non-stationary in levels, signifying the presence of unit root in those variables, thus have to be differenced once to achieve stationarity

Therefore, to remove non-stationarity in the variables, transformation of variables was done through differencing of all the variables at levels included in the model. After differencing all the variables tested at first level, the stationarity is confirmed at the integration of order one I(1). This situation variable at I (1) enables to make plausible analysis for making policy recommendation. Thus I can conclude that all variables included in the vector Auto regressive model are I (1) and from now onwards, it is possible to employ VAR estimation of the model.

4.2.2. Vector Auto regression (VAR) Estimation

4.2.2.1. Lag order Selection Criterion

It is well understood that, the Johnson's approach for co integration is highly sensitive to the number of lags included in the VAR model. A popular method for lag order determination is where the AIC is minimized, which is at the optimum lag order of two in the case of impact of budget deficit on economic growth in Ethiopia. Hence, in subsequent analysis for co integration, VECM and VAR model estimations, the lag length of two is used for estimation of impact of budget deficit on economic growth in Ethiopia.

Regarding the other scenario, the impact of aid on economic growth in Ethiopia, the optimum selected lag order is three. Hence, in subsequent analysis for co integration, VECM and VAR model estimations, the lag length of three is used for estimation of impact of aid on economic growth in Ethiopia.

Table 4.3: Lag Order Determination of the impact of budget deficit on economic growth in Ethiopia

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-26.0562	NA	NA	NA	3.3e-08	2.6445	2.73916	2.98578
1	901.284	1854.7	49	0.000	1.2e-38	-67.6227	-66.8655	-64.8925
2	975.026	147.48*	49	0.000	2.2e-39	-70.1621*	-68.8368*	-65.3841*
3	NA	NA	49	NA	-8.5e-54*	NA	NA	NA

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: Model output

Table 4.4: Lag Order Determination of the impact aid on economic growth in Ethiopia

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	154.63	NA	NA	NA	2.8e-13	-11.8907	-11.8096	-11.5982
1	203	96.732	36	0.000	1.1e-13	-12.88	-12.3121	-10.8323
2	256.588	107.18	36	0.000	4.9e-14	-14.2871	-13.2323	-10.4842
3	349.616	186.06*	36	0.000	4.5e-15*	-18.8493*	-17.3077*	-13.2912*

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Source: stata 14 result and own consolidation

4.2.3. VAR Estimation result

Once the number of lags that should be included in the model is defined it is possible to estimate the VAR result thereof. Accordingly Estimation results of a VAR model for Budget deficit and economic growth with two lags are shown below.

Table 4.5: VAR estimation result of the impact of budget deficit on economic growth

Equation	Parms	RMSE	R-sq	chi2	P>chi2
lnRGDP_d	14	.102164	0.7101	63.67122	0.0000
lnRDPP_d	14	0	1.0000	NA	NA
lnRIR	14	1.05525	0.7168	65.81135	0.0000
lnIR	14	1.27069	0.4966	25.65142	0.0189
lnGCF_d	14	.195598	0.7263	69.00517	0.0000
lnBD_D	14	.646039	0.6083	40.38311	0.0001
lnRER_D	14	.094912	0.7854	95.14955	0.0000

Source stata 14 estimate result

Based on the above table the dependent variable can be explained by dependent variables. So there is significant relationship between dependent variables and independent variable. The direction of relationship can be explained by the following equations based on the result of stata 14. This means the all of the above explained variables have good R-square vales and P-values. As far as I am using VAR it is possible to conclude that there is interrelationship between the selected variables. Thus, selected variables can explain each other. Ermias, 2018 used the same variables to identify the relationship between budget deficit and economic growth and found all variables stated are significant as of mine. Some literatures I referred including Endashaw (2020), Teamrat (2018), Negash, (2014) in one way or another used above mentioned variables to determine the relationship between budget deficit and economic growth and used almost the same variables with me. Finally, they conclude that

there is significant relationship between above mentioned variables. So it is possible to estimate the relationship between budget deficit and economic growth since all selected variables are significant.

Regarding, the impact of aid on economic growth, Once the number of lags that should be included in the model is defined it is possible to estimate the VAR result thereof. Accordingly Estimation results of a VAR model with three lags are shown below. Accordingly, the result of stata by commanding `.varbasiclnRGDP_dlnINVO_dlnHC_dlnLF_dlnPA_dlnODA_d, lags(1/3) step(8)` looks like the following tables.

Table 4.6: VAR estimation result of the impact of aid on economic growth

Equation	Parms	RMSE	R-sq	chi2	P>chi2
lnRGDP_d	19	.122642	0.7860	91.81691	0.0000
lnINVO_d	19	.192433	0.8686	165.207	0.0000
lnHC_d	19	.184976	0.6022	37.85023	0.0041
lnLF_d	19	.001809	0.8370	128.3834	0.0000
lnPA_d	19	.263334	0.6682	50.35356	0.0001
lnODA_d	19	.266595	0.8333	124.9907	0.0000

Source: *model output*

Based on the above table the dependent variable can be explained by dependent variables. So there is significant relationship between dependent variables and independent variable. The direction of relationship can be explained by the following equations based on the result of stata 14. This means all of the above explained variables have good R-square values and P-values. As far as I am using VAR it is possible to conclude that there is interrelationship between the selected variables. Thus, selected variables can explain each other Fentaye (2015) used the same variables for his research on The Impact of Foreign Aid on Economic Growth of Ethiopia using Harrod-domer model and found the significant inter dependence between variables. Haile (2012), Tasew (2011) and Kitessa (2018) in one way or another used above mentioned variables to determine the relationship between aid and economic growth and used almost the same variables with me. Finally, they conclude that there is significant relationship between above mentioned variables. So it is possible to estimate the relationship between budget deficit and economic growth since all selected variables are significant.

Table 4.7 the estimation result of the relationship between budget deficits on economic growth

		Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
lnRGDP_d	lnBD_D					
	L1.	.0752894	.0312801	2.41	0.016	.0139815 .1365974
	L2.	.001043	.0316217	0.03	0.974	-.0609343 .0630203
	Constant	.2667124	.0579148	4.61	0.000	1532016 .3802233
lnBD_D	lnRGDP_d					
	L1.	4.250271	1.367031	3.11	0.002	1.570941 6.929602
	L2.	3.973463	1.260625	3.15	0.002	1.502683 6.444244
	Constant	-.1449647	.3662247	-0.40	0.692	-.862752 .5728226

Source: model output

The second equation in the table indicates that economic growth has positive effect on budget deficit during the sample period of 1990/91-2018/19. The result is statistically significant at 5 percent significance level. In the same fashion, the first equation in the table also shows that, an effect of budget deficit on economic growth in Ethiopia is significantly positive at 5 percent significance level. The joint hypothesis test that, both the other lagged value of budget deficit does not have any effect on economic growth.

In the VAR model of Real budget deficit as dependent variable, coefficient of determination- R^2 is the measure of proportion of the variance of dependent variable (60%) about its mean is explained by its lagged value and the independents or predictor variables, while taking real GDP as dependent variable revealed that, about (71%) of its variance from about its mean is explained by its lagged value, independent variables and lagged value of independent variables. The parameter is zero when the system is in equilibrium and non-zero otherwise. Regarding other variables indicated in the models, as indicated in the appendix 1 inflation rate and real exchange rate has negative impacts on economic growth while the impact of real interest rate and gross capital formation on economic growth is insignificant.

Foreign researcher Epaphra (2017), conducted his research on Tanzania, concluded GDP is negatively related to budget deficit and By contrast, budget deficits, and the rate of inflation and money supply are positively associated which totally reciprocal top my finding. Another foreign researchers Haideret.al (2013) made research on the same study area and founds that there is significant impact of budget deficit on GDP of Bangladesh for the time period of 2000-2012. They found that more specifically, budget deficit shows a significant negative impact on the GDP using the VAR model estimation. Other variable's impact on GDP from the VAR model suggests positive relation with inflation and exchange rate where the relation with unemployment is negative. Using the co-integration tests, it had been found that there are at-least three co-integrating series (i.e. budget deficit, inflation and exchange rate) with 1% level of significance.

Ethiopian researches found different results regarding the relationship between budget deficit and economic growth. For instances, Negash, (2014) founds the positive causal relationship between money supply and inflation both in the short and long run. He added budget deficit affects both money supply and inflation in the long run. Ermias (2018) founds the presence of long run positive and significant relation between two variables in act. Ermias2018 added that, the relationship between budget deficit and economic growth in Ethiopia holds the Keynesian view both in the short run and long run revealing that, the existence of positive relations between budget deficit and economic growth in Ethiopia (Ermias, 2018). According to Teamrat (2018), there is one directional relationship. Real GDP and real effective exchange rate Granger causes current account deficit at 1% and 5% levels of significance respectively.

Endashaw (2020) founds that there is long run positive relationship between budget deficit and economic growth, which is consistent from Keynesians School. Moreover negative relationship between external debt and budget deficit is recorded. The impact of inflation rate and tax revenue is insignificant in both long run and short run. In short run both external debt and economic growth has negative relationship which assert the Freidman and neo-classical paradigm.

The impact of budget deficit on economic growth is still controversial. Most of Ethiopian literatures conclude their researches by supporting Keynesian school of thought while foreign literatures support ne-classical school of thoughts.

As we hypothesized based on Keynesian school of thought, excess of expenditure over revenue has a positive and direct effect on economic growth as central focus of study. Both variables are related positively, other things kept constant; suggestive of which the study is consistent with the work of Bahmani(1999) and Odhiambo and Momanyi (2013) which revealed the positive relationship between budget deficit and economic growth.

The long run relationship captured by VAR model demonstrated the stimulating effect of budget deficit on the economy under the reviewed period of study. The result is giving credence to the keynesian position that government budget deficits in underutilized economies were productive to economic growth by increasing investment and effective demand.

Literatures about the impact of budget deficit on economic growth indicate that interest rate, real gross investment, exchange rate and inflation are the major macroeconomic variables that affects budget deficit on different direction. Thus, I included GDP in a level and first difference of the other variables to control their effects on the relationship between budget deficit and economic growth. Increase in both inflation and interest rate has negative significant impact on economic growth during the study period while an increase in real gross investment has significant positive impact on economic growth and exchange rate does not have significant effect on economic growth. This signifies the earlier conclusion of Keynesian school of thought that budget deficit have positive impact on economic growth. *See appendix 1.* The VAR result of the relationship between aid and on economic growth can be explained by the following table.

Table 4.8 the VAR estimation result of the relationship between budget deficit and economic growth

lnRGDP_d		Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
	lnODA_d						
	L1.	.1890643	.0843196	2.24	0.025	.023801	.3543276
	L2.	- .0354534	.0950957	-0.37	0.709	-.2218375	.1509308
	L3.	.0424355	.0856284	0.50	0.620	-.1253932	.2102641
	_cons	.1147016	.0494864	2.32	0.020	.01771	.2116931
lnODA_d	lnRGDP_d						
	L1.	.7933858	.1632448	-3.64	0.000	-.9136938	- .2737861
	L2.	- .0847898	.1841076	-0.55	0.585	-.4613842	.2603044
	L3.	- .0124185	.1657787	1.82	0.690	-.0231101	.6267305

	_cons	.1111132	.0958069	1.16	0.246	-.0766648	.2988913
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Source: model output

The first equation in the table indicates that foreign aid has positive effect on economic growth during the sample period of 1990/91-2018/19 on the first lag and second and third lags indicates that foreign aid has no significant impact on economic growth based on the p-values. The result is statistically significant at 5 percent significance level. In the same fashion, the second equation in the table shows that, an effect of economic growth on aid is positive in Ethiopia at 5 percent significance level at the first lag and the remaining two lags are insignificant based on p-values. Regarding other variables indicate in the model investment without aid has negative impact on economic growth. The reasons is that investment in Ethiopia is mainly comes from aid that is why when we reduce aid from total investment the relationship will become negative. Human capital and labour force have positive relation with economic growth of the country as stated on the appendix 2. Policy interaction as compositions of different variables including import, export, budget deficit excluding aid, Tele is also related positively to economic growth.

When I compare my result to others researchers in Ethiopian Haile (2012) concluded his finding with foreign aid has negative contribution on RGDP growth both in short run and long run period in Ethiopia disproving the first hypothesis of the study. He added, in the long run and short run on average, a one percentage increase in the aid-to-RGDP ratio leads to a decrease in RGDP growth by about 0.65 % and 0.28% respectively, other variables being constant. He suggested that, Foreign aid interacted with policy index has positive coefficient showing that the effectiveness of aid depends on macroeconomic policy. The result of Haile is totally reverse of my finding. However, Fentaye (2015) made investigation on The Impact of Foreign Aid on Economic Growth of Ethiopia using Harrod-domer model and found that aid contributed positively to economic growth in the long run, but its short run effect appeared insignificant indicating that most of the aid has been used to finance investment which has a long development period. The author suggested aid as, effective in promoting growth in Ethiopia in the period considered. However, its effectiveness would have been higher if it was supported by a sound macroeconomic policy environment. Tasew (2011) studied the relationship between foreign aid and economic growth in Ethiopia and finds that there is positive relationship between aid and economic growth in long run and insignificant relationship between two variables in short run. Kitessa (2018) finds that there is long run relationship among the variables entered in the per capita growth equation. He added, In the

long run, foreign aid inflow entered alone has a positive and significant impact on economic growth. Again, aid interacted with policy appears to have a positive contribution showing that both aid and policy are complementary to each other.

Most of researches conduct in Ethiopia suggested that there is significant relation between aid and economic growth. As I stated above and as per result of my thesis there is positive relation between aid and economic growth. The effectiveness of aid can be realized on variables include increased investment, in physical and human capital; increased capacity to import capital goods or technology; lack of indirect effects that reduce investment or savings rates; and transfer of technology that increases the productivity of capital and promotes endogenous technical change and finally on GDP of the country. If the foreign aid collected from different countries make positive difference on above mentioned variables it is possible to say there is positive relationship between aid and growth. Generally, it is better to conclude that the effectiveness of aid will be based on the institutional structure of the country. Thus, if the aid received is appropriately used for intended purposes the aid collected from different countries become effective and supports the economic growth of the country.

The result of the study comes parallel One with of the best-known attempts to assess the impact of aid on growth which is by Burnside and Dollar (2000).The study shows that aid has positive effects on growth in the good policy environment, while it does not work in a distorted environment. Good policy environments, according to Burnside and Dollar, are those that are open to trade, have low inflation rates, good share of the budget surplus in relation to GDP (lower budget deficit) and balanced government consumption in GDP (Haile Girma, 2015).Burnside and Dollar, thus found that aid significantly increased growth in good policy environments as measured by a composite measure of macroeconomic policies, had no effect in average environments, and was actually damaging in bad policy environments. The result of the study supports the three gap models radiating from the Harrod-Domar growth models (Harrod, 1948; Domar, 1947) on why foreign aid is necessitated. The saving gap model is the first gap that assumes excess supply of labour constrained by lack of capital. The second gap model is the foreign exchange gap where developing countries are constrained by shortage of hard currency to meet the demand for imported capital goods. The third gap model is the fiscal gap model where developing countries are unable to collect sufficient amount of revenue to achieve targeted investment and growth rate. *See appendix 2*

4.2.4. Co-integration and Long-run relationship

4.2.4.1. Co-integration test

Co-integration test tries to examine the interrelationships in long-run movements among economic variables. Although deterministic relationships among the variables are usually assumed to hold only in the long run, economic forces are expected to act in the direction of eliminating short-run deviations from these long-term relationships. When variables are co-integrated, they satisfy one or more long-run relationships (Davidson and MacKinnon, 1999). Co-integration among the variables reflects the presence of long run relationship in the model. Co-integration test is needed because differencing of the variables to attain stationarity generates a model that does not show the long run behavior of the variables. Hence, testing for co-integration is the same as testing for long-run relationship.

In general, if variables that are integrated of order 'd' produce a linear combination which is integrated of order less than 'd' (say 'b' where $b < d$), then the variables are co-integrated and hence have long run relationship (Gujarati, 1995). It is quite possible that if there is a linear combination of integrated variables that is stationary; such variables are said to be co-integrated. To understand the co-integrating relationship across these variables the study uses Johansen (1991) co-integration Test. Having established that the variables are integrated of order one, $I(1)$, it is necessary to determine whether there is at least one linear combination of these variables, i.e. $I(0)$. In other words, is there the existence of a stable and non-spurious (co integrated) relationship among the regressors in each of the relevant specifications.

The study achieves this by using the Johansen maximum likelihood method of co-integration. The number of co integrating vectors (r) is determined by two likelihood ratio tests, namely maximal eigenvalue and the trace statistics.

Table 4.9: Johansen tests for cointegration of the impact of budget deficit on economic growth

Unrestricted Co integration Rank Test (Trace)					
Maximu mrank	parms	LL	Eigenvalue	Trace statistic	5% critical value
0	42	-.38.048656	NA	134.0605	94.15
1	53	-12.245377	0.86260	82.4540	68.52
2	62	6.0616252	0.75542	45.8400*	47.21
3	69	20.23745	0.66393	17.4883	29.68
4	74	26.354541	0.37534	5.2541	15.41

5	77	27.932884	0.11433	2.0974	3.76
6	78	28.981603	0.07750		
Unrestricted Co integration Rank Test (Maximum Eigen value)					
Maximum rank	parms	LL	Eigenvalue	Max statistic	5% critical value
0	42	-38.048656	NA	51.6066	39.37
1	53	-12.245377	0.86260	36.6140	33.46
2	62	6.0616252	0.75542	28.3516	27.07
3	69	20.23745	0.66393	12.2342	20.97
4	74	26.354541	0.37534	3.1567	14.07
5	77	27.932884	0.11433	2.0974	3.76
6	78	28.981603	0.07750		

Source: Own Source stata 14 result, 2020

Trace test indicates 2 co integrating eqn(s) at the 0.05 level

Max-eigenvalue test indicates 2 co integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Table 4.10: Johansen tests for cointegration of the impact of aid on economic growth

Trend: constant

Number of obs = 25

Sample: 0128 - 0152

Lags = 3

Unrestricted Co integration Rank Test (Trace)					
Maximum rank	parms	LL	Eigenvalue	Trace statistic	5% critical value
0	78	248.72043	NA	236.4487	94.15
1	89	304.04945	0.98804	125.7907	68.52
2	98	342.48202	0.95379	48.9255	47.21
3	105	357.50732	0.69941	18.8749*	29.68
4	110	363.69488	0.39043	6.4998	15.41
5	113	365.78194	0.15377	2.3257	3.76
6	114	366.94479	0.08883		
Unrestricted Co integration Rank Test (Maximum Eigen value)					
maximum rank	parms	LL	Eigenvalue	Max statistic	5% critical value
0	78	248.72043	NA	110.6580	39.37
1	89	304.04945	0.98804	76.8651	33.46
2	98	342.48202	0.95379	30.0506	27.07
3	105	357.50732	0.69941	12.3751	20.97
4	110	363.69488	0.39043	4.1741	14.07
5	113	365.78194	0.15377	2.3257	3.76
6	114	366.94479	0.08883		

Source: Own Source stata 14 result, 2020

Trace test indicates 2 co integrating eqn(s) at the 0.05 level

Max-eigenvalue test indicates 2 co integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

The trace statistic result in tables reveal whether there is co-integration vector or not in the constructed model. Therefore at 5% (0.05) critical value the null hypothesis of none existence of co-integrated equation (s) is rejected. Trace statistic (134.0605 and 82.4540) is greater than 5% critical value (94.15 and 68.52) at rank of two which implies the presence of two co-integration equation. From the result of trace statistic the inference of co-integration or long run relationship could be made regarding the impact of budget deficit on economic growth.

Additionally, Trace statistic (236.4487, 125.7907 and 48.9255) is greater than 5% critical value (94.15, 68.52 and 47.21) at rank of three which implies the presence of three co-integration equation. From the result of trace statistic the inference of co-integration or long run relationship could be made regarding the impact of aid on economic growth.

Maximum Eigen value in Tables above shows also the same result with the trace statistics. The null hypothesis for no co-integration is rejected at 5% level of significance by the maximal statistics. The alternative hypothesis indicates that there is at least one co-integrating vector can be accepted. It suggests that there exist precisely one co-integrating vector in the estimated model. Both the trace statistics and max- Eigen statistics rejected the null hypothesis of no co-integration at the 0.05 level. It can be ascertained from both the trace statistics and maximal Eigen values that, in the presence of a trend term, there exists a linear combination of the I (1) variables (co integrating equation) that links them in a stable and long-run relationship.

Haile (2012, Fentaye (2015) made investigation, Tasew (2011), Yohannes (2011) and Kitessa (2018) from their cointegration test result found that the existence of long run relationship between aid and economic growth. All of the researchers used both trace statistics and max-Eigen statistics and rejects the null-hypothesis of no cointegration at 0.05 levels as of mine for the relationship between aid and economic growth in Ethiopia. Furthermore, Teshome (2006), Negash, (2014), Ermias (2018), Teamrat (2018) and Endashaw (2020) founds long run relationship between budget deficit and economic growth. So, all of them was rejects null hypothesis of no cointegration tests as of me.

Hence, the Johansen methodology concludes that there exists at least one co-integrating relationship. Here, it can be deduce that there is a long-run relationship among the variables which is explained by linear combinations of I (1). So, the estimation of ECM model is

required in to test the long run relationships between budget deficit, aid and economic growth.

4.2.5. Vector Error Correction (VEC) Estimation

Economic variables have short run behavior that can be captured through dynamic modeling. If there is long run relationship among the variables, an error correction model can be formulated that portray the dynamic interaction between the variables. Co-integration means the presence of error correcting representation. That is, any deviation from the equilibrium point will revert back to its long run path. Therefore, an ECM depicts both the short run and long run behavior of a model. Engle and Granger (1987) defined ECM as "a particular representation of a vector auto regression appropriate for co-integrated variables.

As stated above even though the relation between aid and economic growth get three cointegration equations it is possible to use one cointegration equation and we can use (p-1) lag period top determine vector error correction model. The researcher commands *.veclnRGDPlnINVOlnODAlnPAlnHClnLF, trend(constant)* to investigate the long run relationship between aid and economic growth and finally obtained the following results.

Table 4.11: Vector error-correction model I

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnRGDP_d	8	.099817	0.7307	51.55186	0.0000
D_lnINVO_d	8	181204	0.7467	56.02181	0.0000
D_lnHC_d	8	129536	0.6506	35.38153	0.0000
D_lnLF_d	8	.001551	0.9985	12740.68	0.0000
D_lnPA_d	8	.228784	0.4853	17.91534	0.0219
D_lnODA_d	8	.293398	0.5651	24.68708	0.0018

Source: model output

In the same fashion the researcher commanded *.veclnRGDPlnGCFlnBDlnRERlnIRlnRIR, trend(constant)* to investigate the long run relationship between budget deficit and economic growth and obtained the following results from stata14.

Table 4.12: Vector error-correction model II

Equation	Parms	RMSE	R-sq	chi2	P>chi2
D_lnRGDP_d	8	.137476	0.6189	29.22933	0.0003
D_lnGCF_d	8	.218655	0.7157	45.31916	0.0000
D_lnBD_D	8	.96907	0.5120	18.88593	0.0155
D_lnRER_D	8	.114556	0.6402	32.02317	0.0001
D_lnIR	8	1.47415	0.4835	16.8496	0.0317
D_lnRIR	8	1.4411	0.5155	19.15465	0.0141

Source: model output

From the above tables we can observe that all variables have good R-square value and p-values which shows the significance of the coefficients of respected variables. However, even though all coefficients from the relationship between aid and economic growth are significant, one variable from the relationship between budget deficit and economic growth, inflation (IR) is insignificant looking from R-square and P-value. The short run equation of error correction terms indicates that all coefficients are statistically significant for both the relationship between budget deficit, aid and economic growth. *See appendix3 and 4.* After doing so, the following tables indicate the long run relationships between economic growth and aid.

Table 4.13: long run equation of Johansen normalization I

Beta	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
_ce1					
lnRGDP_d	1	.	.	.	.
lnINVO_d	.2777195	.0232577	11.94	0.000	.2321352 .3233037
lnHC_d	.2275333	.0576468	3.95	0.000	.1145477 .3405189
lnLF_d	-2.516505	.2682622	-9.38	0.000	-3.04229 -1.990721
lnPA_d	-.7551058	.0504492	-14.97	0.000	-.8539844 -.6562273
lnODA_d	.1794206	.0342228	5.24	0.000	.1123452 .2464961
_cons	19.21155	.	.	.	.

Source: model output

Once we get the above table, during the interpretations the sign of the coefficients must be reversed. So from the above table we conclude that aid has negative impact on the economic growth in the long run and all coefficients are statistically significant looking at the p-values. The VAR estimate indicates that, if there is no distorted policy, foreign aid has positive impact on economic growth. However, in the long run the reverse is true which indicate the country expected reduce foreign aid and starts to mobiles saving to enhance economic growth. Thus, the result above will be interpreted as a percentage change in aid results in 0.18% decrement of economic growth other variables being constant. From the above table except labor force and policy interaction other variables including investment without aid and human capital are related to economic growth negatively. Haile (2012) found that in the long run and short run on average, a one percentage increase in the aid-to-RGDP ratio leads to a decrease in RGDP growth by about 0.65 % and 0.28% respectively, other variables being constant. According to him, Foreign aid interacted with policy index has positive coefficient showing that the effectiveness of aid depends on macroeconomic policy which is similar to my finding in the short run and different from my result in the long run. Fentaye (2015) made investigation on The Impact of Foreign Aid on Economic Growth of Ethiopia using Harrod-

domer model and found that aid contributed positively to economic growth in the long run, but its short run effect appeared insignificant indicating that most of the aid has been used to finance investment which has a long development period and this result most probably related to my finding. .

Tasew (2011) concluded that, foreign aid is important to enhance investments and growth in Ethiopia despite contributing less due to disapproving policies. However, in the long run, rather than just satisfying gaps, aid must help close gaps in Ethiopia, since reliance on future aid and foreign borrowing is must diminished. Yohannes (2011) finds that in the long run foreign aid has a positive and significant impact on growth through its significant contribution to investment and import. However, the dynamic short run model points out that aid to have a significant impact on growth it has to be assisted by good monetary, fiscal and trade policy. Kitessa (2018) finds that in the long run, foreign aid inflow entered alone has a positive and significant impact on economic growth. Again, aid interacted with policy appears to have a positive contribution showing that both aid and policy are complementary to each other. Conclusion of some ours are similar to my finds while the conclusions of other findings are different from my findings. Thus the issue is still controversial and the effectiveness of aid is based on the fiscal monetary and other policy of country. Finally, the author found that it is better to other researcher to conduct research on factors affecting effectiveness of aid in certain countries.

Table 4.14: long run equation of Johansen normalization II

Beta	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
_ce1					
lnRGDP_d	1	.	.	.	.
lnGCF_d	.0751543	.0789426	0.95	0.341	-.0795703 .2298788
lnBD_D	-.1570095	.0331774	-4.73	0.000	-.2220359 -.0919831
lnRER_D	.5702011	.0774003	7.37	0.000	.4184993 .7219029
lnIR	.0092514	.0189081	0.49	0.625	-.0278077 .0463106
lnRIR	-.0228666	.0096252	2.38	-0.018	-.0417316 -.0040016
_cons	-.1076525	.	.	.	.

Source: model output

As we stated above in case of the relationship between aid and economic growth, after reversing the sign of the coefficient, we conclude the relationship between budget deficit and economic growth in the following manner. Budget deficit affect economic growth positively in the long run and the coefficients of the variable is statistically significant looking at the p-values. The result of VECM is similar with the estimate result VAR estimate and both indicate that there is positive relationship between budget deficits and economic growth.

Thus, the result above will be interpreted as a percentage change in budget deficit results in 0.16% increment of economic growth.

When I compare my result to other researchers in Ethiopia, Teshome (2006) finds that the long run expenditure on human capital has a very significant positive impact on growth of real GDP. Besides, private consumption has significant positive impact on economic growth. Government investment expenditure is not significant and the sign of its coefficient is also negative, which probably reflects the inefficient and poor quality nature of public investment.

According to Negash, (2014) budget deficit and economic growth are related positively in the short run and in the long run. Ermias (2018) finds the presence of long run positive and significant relation between two variables in fact. Teamrat (2018) finds that; current account deficit can be used to forecast budget deficit and vice-versa. On the other hand, there is one directional relationship. Real GDP and real effective exchange rate Granger causes current account deficit at 1% and 5% levels of significance respectively. Finally, Endashaw (2020) finds that there is long run positive relationship between budget deficit and economic growth, which is consistent from Keynesians School. Moreover negative relationship between external debt and budget deficit is recorded. The impact of inflation rate and tax revenue is insignificant in both long run and short run. In short run both external debt and economic growth has negative relationship which assert the Friedman and neo-classical paradigm.

As stated above some of the findings of other researchers come parallel with my finding while others are opposite to my findings. Most of the researches I investigated used Inflation, Real Interest Rate, real exchange rate and growth capital formation as explanatory variables. This means budget deficit can affect the economy through the above mentioned variables. Whether it is negative or positive budget deficit affect the above mentioned variables and the above mentioned items in turns affect economic growth of the country negatively or positively.

4.2.6. Post estimation tests

4.2.6.1. Impulse responses function

The impulse response function traced the effects of a one standard deviation shock to the innovation on current and future values of all the endogenous variables of the system. A shock to the j th variable affected directly the same variable and was also transmitted to all

other endogenous variables in the system through the dynamic structure of the VAR (Enders, 1995). This order was also consistent with the variance decomposition analysis postulation that the variation to two shocks were more pronounced in the initial periods of the shock and the influence reduced with the lags as the percentage variation of the other variables in the model increased. The impulse response of each growth variable to a one standard deviation positive shock was generated over the study period with ordering as: budget deficits real GDP inflation; interest rate; real effective exchange rate; and real gross investment for the impact of budget deficit on economic growth and as RGDP, investment without aid, labor force, human capita, policy interaction for the impact of aid on economic growth. The plots and impulse responses that follow summarize the results of the shock evaluation, indicating the responses of each variable over the study period horizon to the initial one standard deviation positive shock to each of the six variables in the VAR equation. *See appendix 5 and 6*

4.2.6.2. Residual Autocorrelation tests

The LM test for autocorrelation in the residuals of a VAR model discussed in Johansen (1995) is implemented. The null hypothesis of the test is that there is no autocorrelation at lag j .

Table 4.15: LM Test of Residual Autocorrelation of VAR of the impact of budget deficit and aid on economic growth

Budget deficit and economic growth				Aid and economic growth			
Lag	chi2	Df	Prob> chi2	Lag	chi2	Df	Prob> chi2
1	4.4043	4	0.35405	1	7.1090	4	0.13024
2	9.6769	4	0.04624	2	1.8727	4	0.75916
3				3	4.7373	4	0.31533

H0: no autocorrelation at lag order

From the above table, since we cannot reject the null hypothesis that there is no autocorrelation in the residuals up to a maximum of two and three respectively; this test gives no suggestions of model misspecification.

4.2.6.3. Normality test

Need to check for non-normal errors in regression models obey both to methodological and conceptual reasons. From a strictly methodological viewpoint, lack of Gaussianity sometimes

harms the reliability of simple estimation and testing procedures and calls for either better methods under alternative distributional assumptions or robust alternatives whose advantages do not depend on distributional features. Additionally, whether errors should be more appropriately captured by skewed or leptokurtic distributions may be a statistically relevant question. The normality assumption also plays a crucial role in the validity of inference procedures, specification tests, and forecasting. In the panel-data literature, Blanchard and M'aty'as (1996) examine the consequences of no normal error components for the performance of several tests. Montes-Rojas and Sosa-Escudero (2011) show that non-normalities severely affect the performance of the panel-heteroskedasticity tests by Holly and Gardiol(2000)and Baltagi, Bresson, and Pirotte(2006). Despite these con-cerns, the Gaussian framework is widely used for specification tests in the one-wayerror-components model. The following tables indicate the output of the normality tests of stata regarding the impact of budget deficit on economic growth in Ethiopia (varnorm, jberaskewness kurtosis).

Table 4.16: VAR Jarque-Bera test of the impact of budget deficit and aid on economic growth

Equation	chi2	Df	Prob> chi2	Equation	chi2	df	Prob> chi2
lnRGDP_d	3.723	2	0.15541	lnRGDP_d	0.168	2	0.91942
lnBD_D	11.66	2	0.00295	lnINVO_d	0.419	2	0.81094
lnRIR	0.290	2	0.86511	lnHC_d	0.762	2	0.68318
lnIR	0.835	2	0.65864	lnLF_d	0.676	2	0.71304
lnRER_D	0.995	2	0.60816	lnPA_d	0.484	2	0.78491
lnGCF_d	0.598	2	0.74167	lnODA_d	1.080	2	0.58262
lnRDPP_d	2.584	2	0.27472	ALL	3.590	12	0.98975
ALL	20.679	14	0.11015				

Source: model output

Table 4.17: Skewness test of the impact of budget deficit on economic growth

Equation	Skewness	chi2	Df	Prob> chi2
lnRGDP_d	86465	3.240	1	0.07187
lnBD_D	-1.3469	7.862	1	0.00505
lnRIR	-.25859	0.290	1	0.59037
lnIR	.10345	0.046	1	0.82950
lnRER_D	-.32041	0.445	1	0.50478

lnGCF_d	-3.6766	0.586	1	0.44407
lnRDPP_d	-.7012	2.131	1	0.14438
ALL		14.599	7	0.4150

Source: *model output*

Table 4.18: Kurtosis test of the impact of budget deficit on economic growth

Equation	Kurtosis	chi2	Df	Prob> chi2
lnRGDP_d	3.6682	0.484	1	0.48676
lnBD_D	4.871	3.793	1	0.05148
lnRIR	2.9938	0.000	1	0.99489
lnIR	3.8533	0.789	1	0.37447
lnRER_D	3.7124	0.550	1	0.45841
lnGCF_d	2.8949	0.012	1	0.91288
lnRDPP_d	3.6469	0.453	1	0.50073
ALL		6.80	7	0.53042

Source: *model output*

The following tables indicate the output of the normality tests of stata regarding the impact of aid on economic growth in Ethiopia (varnorm, jberaskewness kurtosis).

Table 4.19: Skewness test of the impact of aid on economic growth

Equation	Skewness	chi2	df	Prob> chi2
lnRGDP_d	.16592	0.115	1	0.73486
lnINVO_d	-.26154	0.285	1	0.59344
lnHC_d	.40137	0.671	1	0.41262
lnLF_d	.28675	0.343	1	0.55832
lnPA_d	-.00949	0.000	1	0.98454
lnODA_d	-.2717	0.308	1	0.57916
ALL		1.722	6	0.94345

Source: *model output*

Table 4.20: Kurtosis test of the impact of aid on economic growth

Equation	Kurtosis	chi2	df	Prob> chi2
lnRGDP_d	2.7737	0.053	1	0.81736
lnINVO_d	2.6412	0.134	1	0.71422
lnHC_d	3.2952	0.091	1	0.76323
lnLF_d	2.4339	0.334	1	0.56342
lnPA_d	2.3184	0.484	1	0.48662
lnODA_d	2.1386	0.773	1	0.37934
ALL		1.869	6	0.93136

Source: *model output*

It is also important to know if the disturbances in the VAR model are normally distributed. The skewness and kurtosis test statistic is used to check the normality of the disturbances. The null hypothesis of the test is that the disturbances in the VAR are normally distributed. Both results of the skewness and kurtosis test statistic show that the disturbances in the VAR model are normally distributed for the single and joint equations because the null hypothesis cannot be rejected at 5 percent significance level. This shows that there is no misspecification in the model.

4.2.6.4. VAR stability conditions

The output of stata 14 indicates that all eigenvalues lies inside the unit circle and VAR satisfies the stability condition at optimum lag 3 regarding the data of impact of budget deficit on economic growth in Ethiopia.

Table 4.21: The stability test of the impact of budget deficit and aid on economic growth

Budget deficit and economic growth			Aid and economic growth	
Eigenvalue	Modulus		Eigenvalues	Modulus
.9831612	.983161		.9898095	.989809
.3144299 + .5852203i	.664341		.1980912 + .6458847i	.675579
.3144299 - .5852203i	.664341		.1980912 - .6458847i	.675579
-.6329889	.632989		-.4855395	.48554
-.07617954 + .5173836i	.522962			
-.07617954 - .5173836i	.522962			

All the eigenvalues lie inside the unit circle.
VAR satisfies stability condition.

Source: *model output*

The output of stata 14 indicates that all eigenvalues lies inside the unit circle and VAR satisfies the stability condition at optimum lag 4 regarding the data of impact of aid on economic growth in Ethiopia.

Finally, all types of post VECM tests conducted and the researcher finds there is no residual auto correlation, variables are normally distributed and The VECM specification imposes 5 unit moduli both for the impact of budget deficit and economic growth and the relationship between aid and economic growth.

Table 4.22: LM Test of Residual Autocorrelation of VECM of the impact of budget deficit and aid on economic growth

Aid and economic growth				Budget deficit and economic growth			
lag	chi2	df	Prob> chi2	lag	chi2	df	Prob> chi2
1	39.6530	36	0.31038	1	41.5168	36	0.24279
2	32.1093	36	0.65423	2	41.4966	36	0.24347

H0: no autocorrelation at lag order

Source: model output

Table 4.23: VECM Jarque-Bera test of the impact of budget deficit and aid on economic growth

Aid and economic growth				Budget deficit and economic growth			
Equation	chi2	df	Prob> chi2	Equation	chi2	df	Prob> chi2
D_InRGDP	5.629	2	0.05994	D_InRGDP_d	0.809	2	0.66719
D_InINVO	0.871	2	0.64699	D_InGCF_d	0.654	2	0.72111
D_InODA	0.689	2	0.70846	D_InBD_D	2.975	2	0.22591
D_InPA	0.648	2	0.72341	D_InRER_D	0.930	2	0.62820
D_InHC	3.253	2	0.19664	D_InIR	4.772	2	0.09199
D_InLF	0.581	2	0.74786	D_InRIR	0.288	2	0.86570
ALL	11.671	12	0.47249	ALL	10.429	12	0.57839

Source: model output

Table 4.24: VECM Eigenvalue stability condition test of the impact of budget deficit and aid on economic growth

Aid and economic growth		Budget deficit and economic growth	
Eigenvalue	Modulus		
1	1	1	1
1	1	1	1
1	1	1	1
1	1	1	1
1	1	1	1
1	1	1	1
-.7024863	.702486	.2470076 + .680733i	.724162
.6370024	.637002	.2470076 - .680733i	.724162
-.5090033 + .2625878i	.572745	-.6032392 + .3201042i	.682909
-.5090033 - .2625878i	.572745	-.6032392 - .3201042i	.682909
.1008152 + .4669756i	.477734	-.2496219 + .6143774i	.663152
.1008152 - .4669756i	.477734	-.2496219 - .6143774i	.663152
.368019	.368019	-.6600353	.660035

The VECM specification imposes 5 unit moduli.

Source: model output

4.2.2.6. Granger Causality Test Result

Table 4.25 Granger Causality Wald tests Result of the impact of budget deficit on economic growth

Equation	Excluded	chi2	df	Prob> chi2	Equation	Excluded	chi2	df	Prob> chi2
lnRGDP_d	lnRDPP_d	7.9977	1	0.005	lnBD_D	lnRGDP_d	13.541	2	0.001
lnRGDP_d	lnRIR	.23196	2	0.890	lnBD_D	lnRDPP_d	.62462	1	0.429
lnRGDP_d	lnIR	14.415	2	0.001	lnBD_D	lnRIR	2.1354	2	0.344
lnRGDP_d	lnGCF_d	1.7351	2	0.420	lnBD_D	lnIR	12.069	2	0.002
lnRGDP_d	lnBD_D	8.7322	2	0.013	lnBD_D	lnGCF_d	9.2423	2	0.010
lnRGDP_d	lnRER_D	3.0947	2	0.213	lnBD_D	lnRER_D	6.8596	2	0.032
lnRGDP_d	ALL	59.05	11	0.000	lnBD_D	ALL	22.608	11	0.020

Source stata 14 output

Table 4.26 Granger Causality Wald tests Result of the impact of aid on economic growth

Equation	Excluded	chi2	df	Prob> chi2	Equation	Excluded	chi2	df	Prob> chi2
lnRGDP_d	lnINVO_d	28.415	3	0.000	lnODA_d	lnRGDP_d	3.2933	3	0.349
lnRGDP_d	lnHC_d	9.6524	3	0.022	lnODA_d	lnINVO_d	6.864	3	0.076
lnRGDP_d	lnLF_d	23.441	3	0.000	lnODA_d	lnHC_d	6.7885	3	0.079
lnRGDP_d	lnPA_d	18.252	3	0.000	lnODA_d	lnLF_d	12.361	3	0.006
lnRGDP_d	lnODA_d	9.1922	3	0.027	lnODA_d	lnPA_d	6.5963	3	0.086
lnRGDP_d	ALL	77.496	15	0.000	lnODA_d	ALL	51.532	15	0.000

Source: model output

As shown in the above tables the probability (0.013) is less than the significant level 5%(0.05), so the null hypothesis Budget Deficit does not Granger Cause GDP can be rejected, this means Budget Deficit would lead to growth of GDP. The probability (0.001) is also less than the significant level of 5% (0.05), which implies that there is causality running from GDP to Budget Deficit. Therefore, in Ethiopian context there is a bi-directional causation between economic growth tracked by GDP and Budget Deficit over the period between 1990/91 and 2018/19. From the above result (bi-directional causality), we could draw that the increasing of budget deficit (exceeding of government expenditure compared to revenue generated) has stimulated the growth of Gross Domestic Product. On the other hand, the registered robust economic growth of Ethiopia enabled the allocation of increasing budget to promote the performance of each sector of the economy. Here, the point that has to get due attention is that the effort to maximize the collection of domestic revenue parallels to the economic performance. Still now the tax collection performance of Ethiopia is the lower one to cover anticipated current or capital outlays.

Regarding the relationship between aid and economic growth the probability (0.027) is less than the significant level 5 % (0.05), so the null hypothesis aid does not Granger Cause GDP can be rejected, this means aid would lead to growth of GDP. The probability (0.349) is also greater than the significant level of 5% (0.05), which implies that there is no causality running from GDP to aid. Therefore, in Ethiopian context there is a uni-directional causation between economic growth tracked by GDP and aid over the period between 1990/91 and 2018/19. From the above result (uni-directional causality), we could draw that the increasing of aid has un-inspired the growth of Gross Domestic Product. On the other hand, the registered robust economic growth of Ethiopia doesn't affect the aid received from different foreign countries for each sector of the economy. So, the country should reduce foreign aid and mobilize saving to enhance economic development.

5. SUMMERY, CONCLUSION AND POLICY IMPLICATIONS

5.1. Summery and Conclusion

The study analyzes the relationship between budget deficit, aid and economic growth within short and long time horizon in Ethiopia using yearly data obtained from the national bank of Ethiopia, World Bank and MoFED data for the period 1990/91-2018/19. A Vector Autoregressive Model and vector error correction model is estimated by differencing the variables once to avoid problems related to using non stationarity variable. The study also used Johansen co-integration technique to investigate the long run relation and impact of budget deficit and aid on economic growth. It was found that there is a significant and positive long-run relationship between budget deficit and economic growth in Ethiopia through VAR model. Budget deficit, aid and GDP growth rate proxy to economic growth are having positive relationship with inducing and stimulating effect on overall the economy. The error correction model employed to demonstrate short-run relationship revealed that there is significant interaction among the variables in short run as a mechanism of adjustment to reach at long run equilibrium.

Accordingly, for sustainable economic growth, there has to be an optimal rate of budget deficit and aid parallel to level of economic performance but by itself is not harmful. The structure of government expenditure inclined to productive sectors expected to support the pace of economic growth rather than having a retarding effect. On the other hand, tax collection from domestic sources that contribute for revenue is located at lower level compared to income generating capacity of the dynamic and moving economy of Ethiopia. This pushes the country to look at other external alternatives for deficit financing mainly debt. Deficit spending and the resultant cumulative debt could increase economic growth by pumping liquidity and stimulating aggregate demand and then supply side of the economy as observed in this study. However in the long run, the resultant debt is damaging because of higher interest rates and cumulative arrears if there is debt management failure. Increase in borrowing spawns higher interest rates on debt; budget deficit financing could be achieved through increase taxes or decrease in spending. In the study an excess expenditure coupled with consecutive registered positive economic growth while continuous increase in debt burden of the country. After all, study concludes that budget deficits and aid have a significant simulative effect on economic growth and vice versa within the study period.

5.2. Policy Implications

Based on the findings, the followings are recommended.

The results from the study clearly show that budget deficits in Ethiopia are responsible for consecutive economic growth and increase of debt burden from one year to other. It is therefore necessary for the government to maintain the size of the budget deficit to a level that won't affect other macroeconomic variables through fiscal consolidation.

Fiscal consolidation is a policy action aimed at maintaining government deficit at its minimal position and reducing debt accumulation. For Ethiopia the policy should focus on both short term and long term measures. In the short term the government should aim at gradually reducing the budget deficit by raising domestic revenue mobilization through widening tax base. Ethiopia's tax to GDP ratio has stagnated yet government spending has continued to grow. Financing of the growing expenditure has therefore been through foreign aid and government borrowing both externally and internally. This as we have noted, has had negative consequences. In order to mitigate the above consequences, government should institute actions that increase its revenue collection. Such actions should aim at increasing Ethiopia's tax revenue collection by adopting and establishing efficient and effective methods of tax collection. Such measures include but are not limited to; reducing the size of the informal sector which has proved hard to tax, reducing unproductive tax exemptions, Government should improve and heighten its efforts in combating tax evasion and Combating corruption which undermines tax collection efforts.

On the expenditure side, government should reduce its overall recurrent expenditure bill; this could be done by revising the administrative structures created under its decentralization plan. Boosting domestic production and export base; there is also a need for government to pursue policies that will boost the domestic production of goods for both national consumption and export in the long run. A combination of import substitution and export promotion strategies will reduce the reliance on consumption of imported goods as well as boost Ethiopia's export base and revenues thereby lowering the current account deficit.

In this respect, Ethiopia should endeavor to increase agricultural production where it has a competitive advantage as well as value addition through agro processing in the short and

medium term. In the long term however, government should focus on policies that increase industrial output especially the production of manufactured goods.

Ethiopia should position itself and take advantage of the widening regional and international market resulting from regional integration initiatives as well as international partnerships. This means that Ethiopia should endeavor to produce quality products at lower costs compared to potential competitors. Lowering the cost of production and improvement in productivity will make Ethiopia's exports more competitive.

This requires among other things, investing on infrastructure such as roads, railway, energy etc. which would require increased government spending. This means therefore that government should set its priorities right and spend on activities and projects that will result into high economic returns. In addition, government should encourage private sector through public private partnerships to smoothen the financing of infrastructural projects. A credible program of expenditure reductions that would keep government spending at sustainable limits is also imperative. On the other hand, strong debt management and widening of tax base and income by strengthening already began efforts are also crucial measures to boost domestic revenue and minimize risk of default. Based on my findings and comparison of my findings with other researcher findings, factors affecting the effective utilization of budgets and factors affecting effectiveness of aid are most important research areas for the future to determine the effective utilization of budget and aid.

6. REFERENCES

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7. APPENDIX

year	RGDP	RGDP t-1	BD	RIR	RER	IR	GCF
1990/91	128,347,229,368.15	132,336,161,743.17	(1,684,600,000.00)	(38.20)	2.07	45.00	19,684,298,787.09
1991/92	125,406,280,797.79	128,347,229,368.15	(1,454,500,000.00)	4.75	2.07	2.05	16,754,461,777.46
1992/93	139,411,503,047.32	125,406,280,797.79	(1,562,135,000.00)	10.19	2.80	4.71	29,026,609,673.70
1993/94	139,480,175,176.17	139,411,503,047.32	(2,167,700,000.00)	7.71	5.77	6.29	31,468,851,128.87
1994/95	147,454,535,038.68	139,480,175,176.17	(1,327,518,312.00)	(0.26)	6.25	14.84	35,957,634,153.90
1995/96	162,373,139,821.40	147,454,535,038.68	(2,131,150,000.00)	24.08	6.32	(9.00)	40,856,440,500.94
1996/97	169,246,879,131.58	162,373,139,821.40	(1,276,477,446.00)	18.15	6.50	(2.65)	43,065,045,802.25
1997/98	167,917,467,447.15	169,246,879,131.58	(345,735,063.00)	11.50	6.88	0.10	42,820,903,860.47
1998/99	178,512,676,556.18	167,917,467,447.15	(1,488,983,194.20)	1.36	7.51	10.39	44,833,869,100.08
1999/00	364,984,334,372.08	178,512,676,556.18	(4,677,133,336.14)	10.11	8.14	1.89	17,044,915,793.62
2000/01	392,058,835,388.15	364,984,334,372.08	(1,846,078,852.50)	23.52	8.33	(10.77)	18,468,050,021.05
2001/02	398,464,764,819.06	392,058,835,388.15	(6,611,722,311.00)	11.97	8.54	(1.22)	20,242,750,498.22
2002/03	390,102,914,248.33	398,464,764,819.06	(4,811,961,119.00)	(7.02)	8.58	17.77	20,561,431,235.04
2003/04	435,859,450,057.74	390,102,914,248.33	(2,951,198,847.50)	8.37	8.62	2.38	28,978,007,624.15
2004/05	490,970,439,271.57	435,859,450,057.74	(3,781,923,508.88)	(0.25)	8.65	10.75	31,895,716,795.58
2005/06	547,625,363,870.97	490,970,439,271.57	(8,365,501,806.43)	(0.32)	8.68	10.82	41,836,640,218.24
2006/07	612,217,204,345.42	547,625,363,870.97	(2,500,969,046.26)	(4.60)	8.79	15.10	47,975,667,310.58
2007/08	680,706,927,963.07	612,217,204,345.42	(5,338,898,130.34)	(43.74)	9.24	55.24	70,003,456,898.75
2008/09	749,058,849,916.34	680,706,927,963.07	(5,314,981,118.55)	9.54	10.42	2.71	96,074,574,320.30
2009/10	828,212,741,626.90	749,058,849,916.34	(6,296,020,121.84)	4.93	12.89	7.32	119,166,574,834.13
2010/11	922,512,811,185.39	828,212,741,626.90	(5,448,232,242.36)	(26.16)	16.12	38.04	164,525,713,539.15
2011/12	1,002,766,882,208.21	922,512,811,185.39	(16,180,464,997.15)	(8.94)	17.25	20.81	275,811,337,775.09
2012/13	1,102,467,821,910.42	1,002,766,882,208.21	(24,215,671,080.01)	4.49	18.19	7.39	293,930,703,478.13
2013/14	1,216,015,259,581.19	1,102,467,821,910.42	(27,093,435,294.88)	3.42	19.07	8.46	400,841,241,820.10
2014/15	1,342,555,897,690.56	1,216,015,259,581.19	(34,420,343,208.91)	1.43	20.10	10.45	508,975,862,211.78
2015/16	1,449,397,450,594.95	1,342,555,897,690.56	(47,889,285,611.19)	5.25	21.11	7.50	585,665,000,000.00
2016/17	1,596,481,627,920.66	1,449,397,450,594.95	(75,304,765,500.57)	4.39	22.41	8.36	704,596,000,000.00
2017/18	1,719,491,326,176.64	1,596,481,627,920.66	(66,643,180,487.81)	(3.27)	26.11	16.77	751,626,208,979.33
2018/19	1,874,689,297,000.00	1,719,491,326,176.64	(68,169,219,881.26)	(1.80)	28.05	15.30	948,866,000,000.00

year	RGDP	INVO	Total Aid (ODA)	A2	PA	Human capital	labor force
1990/91	128,347,229,368.15	19,648,934,787.09	884,100,000.00	6,089,985.84	4,861,771,662.30	2,409,741,399.20	20,707,238.00
1991/92	125,406,280,797.79	16,720,773,777.46	842,200,000.00	5,656,023.25	4,521,341,256.25	2,383,745,589.54	21,447,526.00
1992/93	139,411,503,047.32	28,979,139,713.70	1,186,749,000.00	10,102,273.90	4,590,909,929.14	2,544,864,849.37	22,191,331.00
1993/94	139,480,175,176.17	31,361,737,448.87	2,677,842,000.00	51,411,161.25	7,141,116,156.86	2,940,866,988.28	22,972,200.00
1994/95	147,454,535,038.68	35,875,674,713.90	2,048,986,000.00	28,472,122.79	5,566,361,434.68	3,028,921,191.10	23,903,334.00
1995/96	162,373,139,821.40	40,757,304,420.94	2,478,402,000.00	37,829,387.79	7,306,261,114.97	3,246,482,755.74	24,766,845.00
1996/97	169,246,879,131.58	42,943,345,622.25	3,042,504,500.00	54,694,264.85	8,528,010,243.54	3,396,733,233.87	25,646,756.00
1997/98	167,917,467,447.15	42,719,991,129.19	2,522,818,282.00	37,903,216.27	5,712,457,601.01	3,381,244,791.66	26,549,148.00
1998/99	178,512,676,556.18	44,621,335,527.92	5,313,339,304.00	158,148,850.29	11,572,236,881.78	3,717,302,545.23	27,488,669.00
1999/00	364,984,334,372.08	16,896,165,215.68	3,718,764,448.64	37,889,870.12	16,653,370,394.20	7,400,664,292.73	28,475,270.00
2000/01	392,058,835,388.15	18,139,337,621.05	8,217,810,000.00	172,250,680.51	15,298,706,446.84	9,179,688,675.24	29,397,274.00
2001/02	398,464,764,819.06	19,971,817,178.22	6,773,333,000.00	115,137,005.78	17,968,702,662.52	11,611,093,200.83	30,379,024.00
2002/03	390,102,914,248.33	20,307,751,971.04	6,341,981,600.00	103,102,871.44	15,377,352,364.74	12,853,190,934.13	31,405,153.00
2003/04	435,859,450,057.74	28,646,763,768.15	8,281,096,400.00	157,336,401.85	19,830,199,490.44	13,346,819,338.52	32,462,533.00
2004/05	490,970,439,271.57	31,615,201,075.58	7,012,893,000.00	100,170,324.52	20,176,410,107.62	13,896,665,996.87	33,555,723.00
2005/06	547,625,363,870.97	41,545,226,142.24	7,285,351,900.00	96,920,916.76	29,501,598,455.64	15,899,080,503.04	34,550,193.00
2006/07	612,217,204,345.42	47,427,064,950.58	13,715,059,000.00	307,248,541.92	31,649,271,181.10	16,944,902,663.87	35,596,163.00
2007/08	680,706,927,963.07	69,452,169,666.75	13,782,180,800.00	279,045,944.45	38,408,365,313.88	18,655,986,325.29	36,711,562.00
2008/09	749,058,849,916.34	95,230,189,828.71	21,109,612,289.75	594,900,829.32	49,338,184,973.57	18,137,890,765.85	37,912,023.00
2009/10	828,212,741,626.90	118,089,463,480.54	26,927,783,839.72	875,506,383.90	57,712,590,722.09	20,133,142,717.03	39,200,114.00
2010/11	922,512,811,185.39	163,274,711,078.74	31,275,061,510.17	1,060,288,226.47	61,379,922,004.06	23,122,598,896.31	40,614,909.00
2011/12	1,002,766,882,208.21	274,700,408,455.09	27,773,233,000.00	769,224,118.74	75,068,977,517.11	22,618,769,055.73	42,102,901.00
2012/13	1,102,467,821,910.42	292,432,839,779.33	37,446,592,470.00	1,271,916,748.72	101,584,716,762.43	26,345,965,867.25	43,655,318.00
2013/14	1,216,015,259,581.19	399,108,911,620.10	43,308,255,000.00	1,542,418,926.38	114,414,665,314.85	27,748,180,364.53	45,172,444.00
2014/15	1,342,555,897,690.56	507,587,151,011.78	34,717,780,000.00	897,783,287.98	114,527,695,257.65	37,424,283,643.40	46,718,750.00
2015/16	1,449,397,450,594.95	583,457,641,396.40	55,183,965,090.00	2,101,059,306.96	173,164,881,639.97	39,764,982,491.92	48,240,655.00
2016/17	1,596,481,627,920.66	702,873,448,566.44	43,063,785,839.00	1,161,610,392.73	205,253,900,122.62	51,028,769,644.15	49,804,178.00
2017/18	1,719,491,326,176.64	749,916,465,454.16	42,743,588,129.28	1,062,531,865.30	191,395,060,735.73	50,993,318,222.81	51,412,462.00
2018/19	1,874,689,297,000.00	946,105,170,457.00	69,020,738,574.91	2,541,147,677.67	230,397,789,746.96	61,864,746,801.00	53,195,214.00

Appendix 1: VAR estimation result of the relationship between budget deficit and economic growth

	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
lnRGDP_d						
lnRGDP_d						
L1.	.1235071	.2161821	0.57	0.568	-.3002021	.5472163
L2.	-.0957235	.1993552	-0.48	0.631	-.4864525	.2950056
lnRDPP_d						
L1.	0	(omitted)				
L2.	-.3157122	.1116373	-2.83	0.005	-.5345173	-.0969071
lnGCF_d						
L1.	.165522	.1257826	1.32	0.188	-.0810073	.4120513
L2.	.0762239	.1267891	0.60	0.548	-.1722781	.324726
lnBD_D						
L1.	.0752894	.0312801	2.41	0.016	.0139815	.1365974
L2.	.001043	.0316217	0.03	0.974	-.0609343	.0630203
lnRER_D						
L1.	-.2453954	.1485874	-1.65	0.099	-.5366214	.0458307
L2.	.0844557	.1454802	0.58	0.562	-.2006804	.3695917
lnRIR						
L1.	.0052401	.0156006	0.34	0.737	-.0253365	.0358166
L2.	.0023135	.0137832	0.17	0.867	-.0247011	.0293281
lnIR						
L1.	-.0101384	.0203678	-0.50	0.619	-.0500586	.0297817
L2.	-.0832334	.0244029	-3.41	0.001	-.1310622	-.0354045
_cons	.2667124	.0579148	4.61	0.000	.1532016	.3802233
lnRDPP_d						
lnRGDP_d						
L1.	1	1.28e-16	7.8e+15	0.000	1	1
L2.	8.54e-17	1.18e-16	0.72	0.471	-1.47e-16	3.17e-16
lnRDPP_d						
L1.	0	(omitted)				
L2.	1.12e-16	6.63e-17	1.69	0.091	-1.79e-17	2.42e-16
lnGCF_d						
L1.	-6.49e-17	7.47e-17	-0.87	0.385	-2.11e-16	8.15e-17
L2.	6.05e-17	7.53e-17	0.80	0.422	-8.71e-17	2.08e-16
lnBD_D						
L1.	-5.97e-17	1.86e-17	-3.22	0.001	-9.61e-17	-2.33e-17

L2.	-4.55e-17	1.88e-17	-2.42	0.015	-8.23e-17	-8.70e-18
lnRER_D						
L1.	1.81e-17	8.82e-17	0.21	0.838	-1.55e-16	1.91e-16
L2.	-4.79e-17	8.64e-17	-0.56	0.579	-2.17e-16	1.21e-16
lnRIR						
L1.	-7.58e-18	9.26e-18	-0.82	0.413	-2.57e-17	1.06e-17
L2.	1.18e-17	8.18e-18	1.44	0.151	-4.28e-18	2.78e-17
lnIR						
L1.	1.92e-17	1.21e-17	1.59	0.113	-4.52e-18	4.29e-17
L2.	1.82e-18	1.45e-17	0.13	0.900	-2.66e-17	3.02e-17
_cons	-9.71e-17	3.44e-17	-2.83	0.005	-1.65e-16	-2.97e-17
lnGCF_d						
lnRGDP_d						
L1.	.4584848	.4138888	1.11	0.268	-.3527224	1.269692
L2.	.4376967	.3816731	1.15	0.251	-.3103687	1.185762
lnRDPP_d						
L1.	0	(omitted)				
L2.	.5577676	.2137338	2.61	0.009	.1388571	.9766781
lnGCF_d						
L1.	-.0672827	.2408155	-0.28	0.780	-.5392723	.404707
L2.	.4439945	.2427425	1.83	0.067	-.0317721	.9197611
lnBD_D						
L1.	-.2491103	.059887	-4.16	0.000	-.3664866	-.1317339
L2.	.019539	.0605408	0.32	0.747	-.0991189	.1381969
lnRER_D						
L1.	.0912634	.2844763	0.32	0.748	-.4662998	.6488266
L2.	-.1735274	.2785274	-0.62	0.533	-.719431	.3723763
lnRIR						
L1.	.0034621	.0298679	0.12	0.908	-.0550779	.0620021
L2.	-.0007449	.0263885	-0.03	0.977	-.0524655	.0509756
lnIR						
L1.	.0912953	.0389949	2.34	0.019	.0148667	.1677239
L2.	.0737439	.0467203	1.58	0.114	-.0178262	.165314
_cons	-.3506159	.11088	-3.16	0.002	-.5679366	-.1332951
lnBD_D						
lnRGDP_d						
L1.	4.250271	1.367031	3.11	0.002	1.570941	6.929602
L2.	3.973463	1.260625	3.15	0.002	1.502683	6.444244

lnRDPP_d						
L1.	0	(omitted)				
L2.	.557925	.7059399	0.79	0.429	-.8256919	1.941542
lnGCF_d						
L1.	2.107223	.7953879	2.65	0.008	.5482919	3.666155
L2.	2.090638	.8017526	2.61	0.009	.5192312	3.662044
lnBD_D						
L1.	-.5240415	.1978003	-2.65	0.008	-.9117231	-.13636
L2.	-.313043	.19996	-1.57	0.117	-.7049573	.0788714
lnRER_D						
L1.	-2.325158	.9395948	-2.47	0.013	-4.166729	-.4835857
L2.	2.055144	.9199463	2.23	0.025	.2520825	3.858206
lnRIR						
L1.	.1143884	.0986505	1.16	0.246	-.078963	.3077398
L2.	.0267009	.0871585	0.31	0.759	-.1441266	.1975283
lnIR						
L1.	-.1459221	.1287961	-1.13	0.257	-.3983577	.1065136
L2.	-.5188781	.1543121	-3.36	0.001	-.8213243	-.2164319
_cons	-.1449647	.3662247	-0.40	0.692	-.862752	.5728226
lnRER_D						
lnRGDP_d						
L1.	.8445412	.2008353	4.21	0.000	.4509113	1.238171
L2.	-.1850262	.1852029	-1.00	0.318	-.5480172	.1779648
lnRDPP_d						
L1.	0	(omitted)				
L2.	.3157552	.1037121	3.04	0.002	.1124832	.5190272
lnGCF_d						
L1.	.5405831	.1168532	4.63	0.000	.311555	.7696113
L2.	.0138401	.1177883	0.12	0.906	-.2170207	.2447009
lnBD_D						
L1.	-.0241956	.0290595	-0.83	0.405	-.0811513	.0327601
L2.	.0568968	.0293768	1.94	0.053	-.0006807	.1144743
lnRER_D						
L1.	.3127172	.1380392	2.27	0.023	.0421654	.583269
L2.	-.0861153	.1351525	-0.64	0.524	-.3510094	.1787788
lnRIR						
L1.	.0142097	.0144931	0.98	0.327	-.0141962	.0426156
L2.	-.0010949	.0128048	-0.09	0.932	-.0261918	.0240019

lnIR						
L1.	-.0239879	.0189219	-1.27	0.205	-.0610741	.0130983
L2.	-.0570513	.0226705	-2.52	0.012	-.1014847	-.0126179
_cons	.0087031	.0538034	0.16	0.871	-.0967495	.1141558
lnRIR						
lnRGDP_d						
L1.	4.817593	2.232925	2.16	0.031	.4411409	9.194045
L2.	4.574392	2.059121	2.22	0.026	.5385885	8.610195
lnRDPP_d						
L1.	0	(omitted)				
L2.	4.355945	1.153091	3.78	0.000	2.095929	6.615962
lnGCF_d						
L1.	2.011687	1.299196	1.55	0.122	-.5346914	4.558064
L2.	4.091877	1.309593	3.12	0.002	1.525122	6.658631
lnBD_D						
L1.	.1015333	.3230895	0.31	0.753	-.5317105	.7347771
L2.	.710448	.3266171	2.18	0.030	.0702903	1.350606
lnRER_D						
L1.	-7.893666	1.534746	-5.14	0.000	-10.90171	-4.88562
L2.	7.172003	1.502652	4.77	0.000	4.22686	10.11715
lnRIR						
L1.	.784077	.1611369	4.87	0.000	.4682544	1.0999
L2.	-.4809749	.1423657	-3.38	0.001	-.7600065	-.2019433
lnIR						
L1.	-.0793894	.2103771	-0.38	0.706	-.4917209	.3329421
L2.	-1.038572	.2520553	-4.12	0.000	-1.532591	-.5445528
_cons	.9094207	.598196	1.52	0.128	-.2630219	2.081863
lnIR						
lnRGDP_d						
L1.	5.684697	2.688812	2.11	0.034	.4147216	10.95467
L2.	3.985721	2.479524	1.61	0.108	-.8740564	8.845498
lnRDPP_d						
L1.	0	(omitted)				
L2.	3.326015	1.388513	2.40	0.017	.604579	6.04745
lnGCF_d						
L1.	1.732753	1.564448	1.11	0.268	-1.333509	4.799015
L2.	3.586366	1.576967	2.27	0.023	.4955671	6.677164
lnBD_D						
L1.	-.5283742	.3890534	-1.36	0.174	-1.290905	.2341565
L2.	-.1537778	.3933012	-0.39	0.696	-.924634	.6170784
lnRER_D						

L1.	.5690619	1.848089	0.31	0.758	-3.053125	4.191249
L2.	1.394191	1.809442	0.77	0.441	-2.152251	4.940632
lnRIR						
L1.	-.1860721	.1940357	-0.96	0.338	-.566375	.1942308
L2.	-.2993503	.1714319	-1.75	0.081	-.6353507	.0366501
lnIR						
L1.	-.176357	.2533289	-0.70	0.486	-.6728726	.3201585
L2.	-.2145832	.3035164	-0.71	0.480	-.8094644	.3802981
_cons	1.388713	.7203273	1.93	0.054	-.0231022	2.800529
.						

Appendix 2: VAR estimation result of the relationship between budget deficit and economic growth

Coef.	Std. Err.	z	P>z	[95% Conf. Interval]		
lnRGDP_d						
lnRGDP_d						
L1.	-.8001285	.3997647	-2.00	0.045	-1.583653	-.0166042
L2.	-.3223771	.3446759	-0.94	0.350	-.9979295	.3531753
L3.	-.0149611	.2385147	-0.06	0.950	-.4824414	.4525192
lnINVO_d						
L1.	-.1394923	.1284908	-1.09	0.278	-.3913296	.112345
L2.	-.4789064	.120007	-3.99	0.000	-.7141158	-.2436969
L3.	-.1451577	.1697358	-0.86	0.392	-.4778337	.1875183
lnHC_d						
L1.	.1194277	.2508386	0.48	0.634	-.3722069	.6110623
L2.	.4928062	.1882953	-2.62	0.009	-.8618581	-.1237542
L3.	.5786452	.3062297	-1.89	0.059	-1.178844	.0215541
lnLF_d						
L1.	55.40487	13.93536	3.98	0.000	28.09207	82.71768
L2.	-52.62217	17.38759	-3.03	0.002	-86.70122	-18.54312
L3.	-12.00409	19.64755	-0.61	0.541	-50.51258	26.5044
lnPA_d						
L1.	.5566868	.189414	2.94	0.003	.1854422	.9279313
L2.	.1371336	.2822903	0.49	0.627	-.4161453	.6904124
L3.	.1720495	.1614401	1.07	0.287	-.1443673	.4884663
lnODA_d						
L1.	.1890643	.0843196	2.24	0.025	.023801	.3543276
L2.	-.0354534	.0950957	-0.37	0.709	-.2218375	.1509308
L3.	.0424355	.0856284	0.50	0.620	-.1253932	.2102641
_cons	.717612	.324242	2.21	0.027	.0821093	1.353115
lnINVO_d						
lnRGDP_d						
L1.	1.06048	.6272594	1.69	0.091	-.1689259	2.289886
L2.	.561246	.5408212	1.04	0.299	-.4987441	1.621236

L3.	.8724976	.3742467	2.33	0.020	.1389875	1.606008
lnINVO_d						
L1.	.4487369	.2016112	2.23	0.026	.0535861	.8438877
L2.	.9763475	.1882996	5.19	0.000	.6072871	1.345408
L3.	.4847374	.2663276	1.82	0.069	-.0372551	1.00673
lnHC_d						
L1.	.9732724	.3935837	2.47	0.013	.2018624	1.744682
L2.	.8471569	.2954488	2.87	0.004	.2680879	1.426226
L3.	.2372651	.4804964	0.49	0.621	-.7044906	1.179021
lnLF_d						
L1.	-77.41081	21.86558	-3.54	0.000	-120.2666	-34.55506
L2.	107.6477	27.28238	3.95	0.000	54.17523	161.1202
L3.	-70.48591	30.82842	-2.29	0.022	-130.9085	-10.06333
lnPA_d						
L1.	-1.548071	.2972041	-5.21	0.000	-2.13058	-.9655612
L2.	-.4863065	.4429337	-1.10	0.272	-1.354441	.3818277
L3.	-.6379728	.2533111	-2.52	0.012	-1.134454	-.1414922
lnODA_d						
L1.	.4848491	.1542592	3.14	0.002	.1825065	.7871916
L2.	.1336271	.1866003	0.72	0.474	-.2321028	.499357
L3.	-.1655886	.1691056	-0.98	0.327	-.4970295	.1658524
_cons	1.062259	.508759	2.09	0.037	.0651101	2.059409
lnHC_d						
lnRGDP_d						
L1.	-.7040353	.6029506	-1.17	0.243	-1.885797	.4777263
L2.	-.3918339	.5198623	-0.75	0.451	-1.410745	.6270774
L3.	.2208543	.3597432	0.61	0.539	-.4842294	.9259379
lnINVO_d						
L1.	-.2969199	.193798	-1.53	0.125	-.676757	.0829172
L2.	-.39559	.1810023	-2.19	0.029	-.750348	-.0408321
L3.	-.2252517	.2560063	-0.88	0.379	-.7270149	.2765115
lnHC_d						
L1.	-.2503942	.3783308	-0.66	0.508	-.991909	.4911205
L2.	.0024476	.283999	0.01	0.993	-.5541802	.5590753
L3.	-.8135512	.4618753	-1.76	0.078	-1.71881	.0917077
lnLF_d						
L1.	46.02808	21.0182	2.19	0.029	4.833158	87.223
L2.	-24.29825	26.22508	-0.93	0.354	-75.69846	27.10196
L3.	-16.56497	29.63369	-0.56	0.576	-74.64594	41.516
lnPA_d						
L1.	.6834797	.2856863	2.39	0.017	.1235449	1.243415
L2.	.3333646	.4257683	0.78	0.434	-.5011259	1.167855
L3.	.3471988	.2434943	1.43	0.154	-.1300413	.8244389
lnODA_d						
L1.	-.2350362	.1482811	-1.59	0.113	-.5256618	.0555894
L2.	-.3011922	.1793688	-1.68	0.093	-.6527486	.0503643

L3.	-.1952573	.1625521	-1.20	0.230	-.5138536	.123339
_cons	.2036056	.4890426	0.42	0.677	-.7549003	1.162112
lnLF_d						
lnRGDP_d						
L1.	-.0243013	.0058953	-4.12	0.000	-.0358559	-.0127467
L2.	-.0153998	.0050829	-3.03	0.002	-.0253621	-.0054374
L3.	-.00262	.0035174	-0.74	0.456	-.0095139	.0042739
lnINVO_d						
L1.	.0013966	.0018948	0.74	0.461	-.0023172	.0051104
L2.	-.0022188	.0017697	-1.25	0.210	-.0056874	.0012498
L3.	-.0096713	.0025031	-3.86	0.000	-.0145773	-.0047654
lnHC_d						
L1.	.0075202	.0036991	2.03	0.042	.0002701	.0147704
L2.	.0016964	.0027768	0.61	0.541	-.003746	.0071388
L3.	-.0160654	.004516	-3.56	0.000	-.0249165	-.0072143
lnLF_d						
L1.	.9084545	.2055043	4.42	0.000	.5056735	1.311235
L2.	.5031192	.2564142	1.96	0.050	.0005566	1.005682
L3.	-.8535723	.2897417	-2.95	0.003	-1.421456	-.285689
lnPA_d						
L1.	.0068874	.0027933	2.47	0.014	.0014127	.0123622
L2.	.0124237	.0041629	2.98	0.003	.0042645	.0205828
L3.	.0074279	.0023808	3.12	0.002	.0027617	.0120941
lnODA_d						
L1.	2.99e-06	.0014498	0.00	0.998	-.0028386	.0028446
L2.	-.0019168	.0017538	-1.09	0.274	-.0053542	.0015205
L3.	-.0032429	.0015893	-2.04	0.041	-.006358	-.0001279
_cons	.0182464	.0047816	3.82	0.000	.0088747	.0276181
lnPA_d						
lnRGDP_d						
L1.	1.064537	.8583676	1.24	0.215	-.6178325	2.746907
L2.	1.547453	.740082	2.09	0.037	.0969194	2.997988
L3.	.3036676	.5121346	0.59	0.553	-.7000977	1.307433
lnINVO_d						
L1.	-.3486048	.2758931	-1.26	0.206	-.8893454	.1921358
L2.	.2462889	.257677	0.96	0.339	-.2587486	.7513265
L3.	.5992098	.3644536	1.64	0.100	-.1151062	1.313526
lnHC_d						
L1.	-.0711858	.5385962	-0.13	0.895	-1.126815	.9844433
L2.	-.4257069	.4043043	-1.05	0.292	-1.218129	.3667149
L3.	.0178855	.6575311	0.03	0.978	-1.270852	1.306623
lnLF_d						
L1.	32.08569	29.92176	1.07	0.284	-26.55988	90.73127
L2.	-70.89918	37.33433	-1.90	0.058	-144.0731	2.274762
L3.	11.6837	42.18687	0.28	0.782	-71.00105	94.36845

lnPA_d							
L1.	-1.030201	.4067064	-2.53	0.011	-1.827331	-.2330713	
L2.	-1.559731	.6061287	-2.57	0.010	-2.747721	-.3717403	
L3.	-1.1801249	.3466413	-0.52	0.603	-.8595295	.4992796	
lnODA_d							
L1.	-.1306771	.2110947	-0.62	0.536	-.544415	.2830609	
L2.	-.1110531	.2553516	-0.43	0.664	-.611533	.3894268	
L3.	.0582321	.2314111	0.25	0.801	-.3953253	.5117894	
_cons	1.190825	.6962068	1.71	0.087	-.1737149	2.555366	
lnODA_d							
lnRGDP_d							
L1.	.7933858	.1632448	-3.64	0.000	-.9136938	-.2737861	.7933858
L2.	-.0847898	.1841076	-0.55	0.585	-.4613842	.2603044	-.0847898
L3.	-.0124185	.1657787	1.82	0.069	-.0231101	.6267305	-.0124185
lnINVO_d							
L1.	-.6784942	.2793103	-2.43	0.015	-1.225932	-.1310562	
L2.	.3906607	.2608685	1.50	0.134	-.1206322	.9019535	
L3.	.3072945	.3689677	0.83	0.405	-.4158688	1.030458	
lnHC_d							
L1.	-.5996757	.5452671	-1.10	0.271	-1.66838	.4690281	
L2.	-.9527705	.4093119	-2.33	0.020	-1.755007	-.150534	
L3.	-.0824569	.6656751	-0.12	0.901	-1.387156	1.222242	
lnLF_d							
L1.	-47.02572	30.29237	-1.55	0.121	-106.3977	12.34623	
L2.	-37.3742	37.79674	-0.99	0.323	-111.4544	36.70605	
L3.	32.19625	42.70939	0.75	0.451	-51.51261	115.9051	
lnPA_d							
L1.	-.4780298	.4117437	-1.16	0.246	-1.285033	.3289731	
L2.	-.6087243	.6136361	-0.99	0.321	-1.811429	.5939804	
L3.	.2366568	.3509348	0.67	0.500	-.4511627	.9244762	
lnODA_d							
L1.	-.5295384	.2137092	-2.48	0.013	-.9484009	-.110676	
L2.	.1287822	.2585143	0.50	0.618	-.3778965	.6354608	
L3.	.4538729	.2342773	1.94	0.053	-.0053021	.9130479	
_cons	1.903408	.7048298	2.70	0.007	.521967	3.284849	

Appendix 3: short run equation of VECM of the relationship between aid and economic growth

Coef.	Std. Err.	z	P>z	[95% Conf. Interval]		
D_lnRGDP						
_ce1						
L1.	-1.347247	.4380689	-3.08	0.002	-2.205847	-.488648
lnRGDP						

LD.	.298771	.2957768	1.01	0.312	-.2809409	.8784829
lnINVO						
LD.	.3512689	.1910898	1.84	0.066	-.0232601	.725798
lnODA						
LD.	.1272852	.0818042	1.56	0.020	-.0330481	.2876185
lnPA						
LD.	-.2159412	.2054164	-1.05	0.293	-.6185498	.1866675
lnHC						
LD.	.0885023	.2669901	0.33	0.740	-.4347886	.6117932
lnLF						
LD.	20.5915	10.52866	1.96	0.050	-.0442904	41.22729
_cons	.2659938	.3513659	0.76	0.449	-.4226707	.9546582
D_lnINVO						
_ce1						
L1.	3.618188	.7952541	4.55	0.000	2.059518	5.176857
lnRGDP						
LD.	-.6431222	.5369423	-1.20	0.231	-1.69551	.4092654
lnINVO						
LD.	-1.225602	.3468973	-3.53	0.000	-1.905508	-.5456955
lnODA						
LD.	-.3412036	.1485043	-2.30	0.022	-.6322667	-.0501405
lnPA						
LD.	.8367279	.3729053	2.24	0.025	.105847	1.567609
lnHC						
LD.	-1.212225	.4846839	-2.50	0.012	-2.162188	-.2622622
lnLF						
LD.	-63.74113	19.11334	-3.33	0.001	-101.2026	-26.27968
_cons	.0863205	.6378566	0.14	0.892	-1.163855	1.336496
D_lnODA						
_ce1						
L1.	-.308794	1.287642	0.24	0.810	-2.214938	2.832526
lnRGDP						
LD.	1.368909	.8693945	1.57	0.115	-.3350733	3.072891
lnINVO						
LD.	-.0135728	.5616816	-0.02	0.981	-1.114448	1.087303
lnODA						
LD.	-.3844779	.240452	-1.60	0.110	-.8557551	.0867994
lnPA						
LD.	-.3760837	.6037926	-0.62	0.533	-1.559495	.8073281
lnHC						

LD.	-.5577695	.7847798	-0.71	0.477	-2.09591	.9803707
lnLF						
LD.	-29.29219	30.94751	-0.95	0.344	-89.9482	31.36383
_cons	.9753301	1.032791	0.94	0.345	-1.048903	2.999563
D_lnPA						
_ce1						
L1.	-.1839299	1.004069	-0.18	0.855	-2.15187	1.78401
lnRGDP						
LD.	.7083774	.677931	1.04	0.296	-.6203428	2.037098
lnINVO						
LD.	.3200132	.4379845	0.73	0.465	-.5384206	1.178447
lnODA						
LD.	.0451497	.1874981	0.24	0.810	-.3223399	.4126392
lnPA						
LD.	-.5134515	.4708216	-1.09	0.275	-1.436245	.4093418
lnHC						
LD.	-.3435288	.6119507	-0.56	0.575	-1.54293	.8558725
lnLF						
LD.	4.643503	24.13206	0.19	0.847	-42.65446	51.94146
_cons	.1077032	.805343	0.13	0.894	-1.47074	1.686146
D_lnHC						
_ce1						
L1.	-1.073117	.5684962	-1.89	0.059	-2.187349	.041115
lnRGDP						
LD.	.5144309	.3838392	1.34	0.180	-.23788	1.266742
lnINVO						
LD.	.2520299	.2479834	1.02	0.309	-.2340086	.7380683
lnODA						
LD.	.2107541	.10616	1.99	0.047	.0026844	.4188238
lnPA						
LD.	-.2547404	.2665755	-0.96	0.339	-.7772186	.2677379
lnHC						
LD.	.0360962	.3464816	0.10	0.917	-.6429953	.7151877
lnLF						
LD.	16.69753	13.66338	1.22	0.222	-10.0822	43.47726
_cons	.2193271	.4559788	0.48	0.631	-.674375	1.113029
D_lnLF						
_ce1						
L1.	.0041624	.0068054	0.61	0.541	-.009176	.0175008
lnRGDP						

LD.	-.0063205	.0045949	-1.38	0.169	-.0153264	.0026853
lnINVO						
LD.	-.0008727	.0029686	-0.29	0.769	-.0066911	.0049456
lnODA						
LD.	.0020054	.0012708	1.58	0.115	-.0004854	.0044962
lnPA						
LD.	.002173	.0031912	0.68	0.496	-.0040815	.0084276
lnHC						
LD.	.0010094	.0041477	0.24	0.808	-.00712	.0091387
lnLF						
LD.	.6775828	.1635634	4.14	0.000	.3570045	.9981612
_cons	.0079616	.0054585	1.46	0.145	-.0027368	.0186601

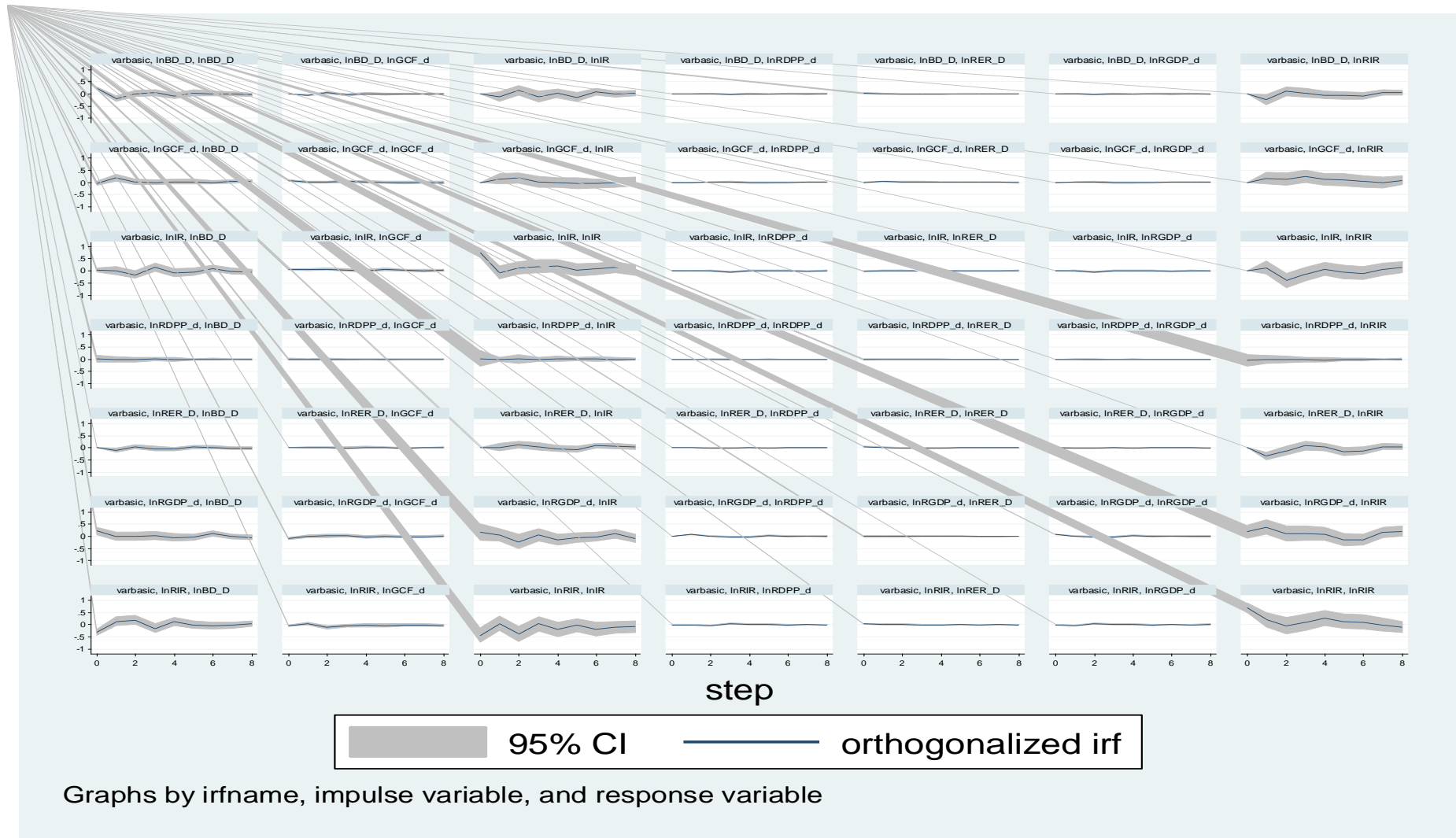
Appendix 4: short run equation of VECM of the relationship between budget deficit and economic growth

Coef.	Std. Err.	z	P>z	[95% Conf. Interval]		
D_lnRGDP_d						
_ce1						
L1.	-.5879403	.3014934	-1.95	0.051	-1.178857	.002976
lnRGDP_d						
LD.	-.1313324	.2393875	-0.55	0.583	-.6005233	.3378585
lnGCF_d						
LD.	.0104026	.1013772	0.10	0.918	-.1882931	.2090983
lnBD_D						
LD.	.0051597	.0379423	-0.14	0.0892	-.0795252	.0692059
lnRER_D						
LD.	.168278	.1833053	0.92	0.359	-.1909938	.5275498
lnIR						
LD.	.0442352	.0171373	2.58	0.010	.0106467	.0778237
lnRIR						
LD.	-.0340357	.0169567	-2.01	0.045	-.0672702	-.0008011
_cons	.0042951	.0273285	0.16	0.875	-.0492678	.0578581
D_lnGCF_d						
_ce1						
L1.	.4987498	.4795238	1.04	0.298	-.4410995	1.438599
lnRGDP_d						
LD.	-.222417	.3807446	-0.58	0.559	-.9686627	.5238287
lnGCF_d						
LD.	-.5909542	.1612399	-3.67	0.000	-.9069786	-.2749297
lnBD_D						

LD.	-.099194	.060347	-1.64	0.100	-.217472	.019084
lnRER_D						
LD.	-.3152628	.2915462	-1.08	0.280	-.8866828	.2561572
lnIR						
LD.	-.0085253	.0272568	-0.31	0.754	-.0619477	.0448971
lnRIR						
LD.	.0571425	.0269696	2.12	0.034	.0042831	.1100019
_cons	-.0109727	.0434659	-0.25	0.801	-.0961643	.0742189
D_lnBD_D						
_ce1						
L1.	-2.463028	2.125232	1.16	0.246	-1.702351	6.628406
lnRGDP_d						
LD.	-1.790489	1.687446	-1.06	0.289	-5.097823	1.516845
lnGCF_d						
LD.	.8572568	.7146096	1.20	0.230	-.5433523	2.257866
lnBD_D						
LD.	-.2909687	.2674559	-1.09	0.277	-.8151726	.2332352
lnRER_D						
LD.	-.809787	1.292122	-0.63	0.531	-3.3423	1.722726
lnIR						
LD.	-.0105304	.1208013	-0.09	0.931	-.2472966	.2262357
lnRIR						
LD.	-.0730527	.1195282	-0.61	0.541	-.3073237	.1612183
_cons	-.0383691	.1926393	-0.20	0.842	-.4159353	.339197
D_lnRER_D						
_ce1						
L1.	-.725293	.2512276	-2.89	0.004	-1.21769	-.232896
lnRGDP_d						
LD.	.8831143	.1994761	4.43	0.000	.4921483	1.27408
lnGCF_d						
LD.	.4103866	.0844753	4.86	0.000	.244818	.5759551
lnBD_D						
LD.	-.0830435	.0316164	-2.63	0.009	-.1450106	-.0210764
lnRER_D						
LD.	.1224913	.1527441	0.80	0.423	-.1768817	.4218643
lnIR						
LD.	-.0025643	.0142801	-0.18	0.857	-.0305528	.0254243
lnRIR						
LD.	-.0062816	.0141296	-0.44	0.657	-.0339752	.021412
_cons	-.0043034	.0227722	-0.19	0.850	-.0489362	.0403294

D_lnIR						
_ce1						
L1.	3.2792	3.232895	1.01	0.310	-3.057158	9.615557
lnRGDP_d						
LD.	.5141427	2.566937	0.20	0.841	-4.516961	5.545247
lnGCF_d						
LD.	-.1300209	1.087061	-0.12	0.905	-2.260622	2.00058
lnBD_D						
LD.	.2196974	.4068528	0.54	0.589	-.5777195	1.017114
lnRER_D						
LD.	1.599377	1.965571	0.81	0.416	-2.253072	5.451826
lnIR						
LD.	-.5960387	.1837624	-3.24	0.001	-.9562064	-.235871
lnRIR						
LD.	-.2145466	.1818258	-1.18	0.238	-.5709187	.1418255
_cons	.0259612	.2930422	0.09	0.929	-.5483909	.6003133
D_lnRIR						
_ce1						
L1.	-.1998398	3.160426	-0.06	0.950	-6.39416	5.99448
lnRGDP_d						
LD.	2.072817	2.509396	0.83	0.409	-2.845509	6.991142
lnGCF_d						
LD.	-.4686836	1.062694	-0.44	0.659	-2.551525	1.614158
lnBD_D						
LD.	-.1605611	.3977327	-0.40	0.686	-.9401029	.6189807
lnRER_D						
LD.	-5.352208	1.921511	-2.79	0.005	-9.118299	-1.586116
lnIR						
LD.	.4309763	.1796432	2.40	0.016	.0788822	.7830704
lnRIR						
LD.	-.0691078	.17775	-0.39	0.697	-.4174914	.2792758
_cons	-.0713016	.2864733	-0.25	0.803	-.6327789	.4901757

Appendix 5: Impulse responses function of the impact of budget deficit on economic growth



Appendix 6: Impulse responses function of the impact of aid on economic growth

