The Causal Link between Foreign Aid and Economic Growth in Ethiopia

A Thesis Submitted to the School of Graduate Studies of Jimma University in Partial Fulfillment of the Requirements for the Degree of Masters of Science in Development Economics

BY

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DEPARTMENT OF ECONOMICS

JUNE 18, 2021

JIMMA, ETHIOPIA

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MSc. PROGRAM

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CERTIFICATE

This is to certify that the thesis entitles "The Causal Link between Foreign Aid and Economic Growth in Ethiopia"; Submitted to Jimma University for the award of the Degree of Master of Development Economics and thesis work is carried out by Mr. Sagni Gudeta Bekena, under our guidance and supervision.

Therefore, we hereby declare that no part of this thesis paper has been submitted to any other University or institution for the award of any degree or diploma.

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DECLARATION

I hereby declare that this thesis entitled “The Causal link between Foreign Aid and Economic Growth in Ethiopia”, has been carried out by me under the guidance and supervision of Mr. Tekilu Tadesse (Assistant professor) and Mr. Negese Tamirat (MSc). All sources of materials used for this thesis paperwork have been duly acknowledged. I surely declare that this thesis paperwork is original and has not been submitted for the award of any degree or diploma to any university or institution.

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ABSTRACT

This paper investigates the causal linkage between foreign aid and economic growth in Ethiopia based on time series annual data for the period 1981 to 2020. The Autoregressive Distributed Lag approach to Co-integration and Error Correction Model was applied to investigate the long-run and short-run relationship between economic growth and its determinants. Therefore, the results of the bound test confirmed that the long-run relationship between explanatory variables and economic growth. The empirical results implied evidence of a long-run and short-run negative impact of foreign aid on economic growth in Ethiopia. Concerning other control variables except for squared foreign aid and political instability, all variables significantly influence economic growth in the long run. While in the short-run, gross capital formation, total export, external debt, inflation rate, and drought have a significant impact on economic growth but human capital, and political instability is insignificant. Furthermore, Vector error correction model Granger causality tests show that the direction of causality is running from economic growth to foreign aid in the long run, and no short-run causality exists between foreign aid and economic growth. The study also found that economic growth during EPRDF relatively strong in growth compared to the military regime, and foreign aid as a percentage of GDP declining during the study period under consideration. Therefore, based on the finding, the government should minimize the dependence on foreign aid, and work to bridge gaps in the financial source by setting policies to increase domestic saving which is believed as a backbone of economic growth.

Keywords: *Autoregressive distributed lag approach, Economic growth, Foreign aid, Granger causality test, and Vector error correction model.*

ACKNOWLEDGEMENTS

First and foremost I would like to give great and unlimited thanks to GOD, for his commitment and make everything all right to complete my thesis within a stated time. Secondly, I would like to express my heartfelt appreciation of gratitude to my main advisor Mr. Tekilu Tadesse (Assistance professor), and my Coadvisor Mr. Negese Tamirat (MSc) for their valuable advice, suggestion, and constructive comments on my thesis paper. Thirdly, Wollega University also deserves great thanks for sponsoring my study for two years at Jimma University. Last but not least, I want to extend my gratitude also to all my friends and parents who have shared their affections and knowledge in all the matters I needed.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey-Fuller test
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
CUSUM	Cumulative Sum of recursive residuals
CUSUMSQ	Cumulative Sum of Squares of recursive residuals
DAC	Development Assistance Committee
DAG	Development Assistance Group
ECM	Error Correction Model
EPRDF	Ethiopian People Revolutionary Democratic Front
FDI	Foreign Direct Investment
GTP	Growth and Transformation Program
ICOR	Incremental Capital-output Ratio
ISLM	Investment Saving Liquidity Preference Money Supply
MoFED	Ministry of Finance and Economic Development
NBE	National Bank of Ethiopia
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PP	Philip-Perron test
RESET	Regression Equation Specification Error Test
SDG	Sustainable Development Goals
SDPRP	Sustainable Development and Poverty Reduction Program

CHAPTER ONE
INTRODUCTION

1.1. Background of the Study

Foreign aid is the source of external finance of the economy of least developed countries(Wamboye et al, 2013). The flow of capital to developing countries should be non-commercial from the purpose of view of the donor on development and poverty reduction, and it should be characterized by concessional terms; that's, the interest rate and repayment period for borrowed capital should be softer than commercial terms are called foreign aid(Todaro & Smith, 2012). The International Organization Millennium Declaration recognizes that aid is an Official Development Assistance (ODA) that's a necessary and complementary source of finance for development and achieving the MDGs, and defined as government aid that encourages and targets to economic development and well-being of developing countries (OECD, 2018). This external finance originates within the type of bilateral loans, grants, food aid, emergency relief, financing for construction projects, technical assistance, and multilateral flows (Tang and Bundhoo, 2017).

Foreign aid to developing countries has been a major source of finance to improve economic growth(Mustafa, 2014), and continues to draw significant attention and encourage the economic process by enhancing domestic savings thereby increasing the amount of investment and capital stock. Increasing the effectiveness of aid requires that developing countries are helped to boost the welfare of their poorest populations. This requires developing countries to fundamentally change the way to emphasize viable projects to benefit from foreign aid(Edward and Karamuriro, 2020). However, the question of whether or not aid flow is harmful to the economic process has been a subject matter of intense debate to scholars and policymakers. The returns to aid are supposed by some to be negative within the long term because the increased inflows of aid lose their original purpose and allow payments to be wasted in unproductive economic activities(Belay & Girma, 2018).

Sub-Saharan Africa is encountered with low savings and low investment. Thus, the necessary investments to lead GDP growth are inadequate and this leads to dependence on external support within the hope that these external resources would fill the domestic savings and foreign

exchange gaps(Kwakye, 2010). Since the 1960s, over $600 billion is transferred to the continent as economic aid. While the continuing and increasing amount of aid for over half a century, little has been achieved in terms of development within the continent. Besides, the continent's aid dependence continues, and it's not expected to be reduced shortly (Farah et al, 2018).

The history of foreign aid in Ethiopia dates, just as in most African countries, as far back to the immediate post-World War II period. For instance, an inflow of external resources such as loans and grants have started in 1950, the year in which the relationship between the United States and Ethiopia reached a higher level. The pre-1975, about 75% of the required total investment during the time series of five-year development plan periods (1957-1973) was covered by external capital(Adane, 2015). Within the subsequent years (1980-97), Ethiopia's total ODA receipt exceeds the US $ 17 billion in nominal terms (the US $23 billion in real terms). Based on the 1996 prices, the annual inflow of net ODA (loans, grants, technical assistance, and food aid) to Ethiopia averaged US$ 1.2 billion per year in the 1980s, then raised to US $1.4 billion per annual within the period 1991-1996 before slowing subsequently(Gadisa et al, 2018).

Ethiopia is being one of the developing countries, they are the biggest recipients of development assistance and continued to be one among the main recipients of international aid in recent times. Net ODA to Ethiopia amounted to USD 3.563 billion in 2011, and USD 4,211.43 million from development partners in 2016, making the country the most important among aid receiving developing countries. For instance, the largest contributors of ODA are the World Bank, the United States, the United Kingdom, the European Union, African Development Bank, Germany, Canada, Netherlands, and Japan(Development Assistance Group, 2018). Ethiopia's recent economic process has been driven by strategic, government-led, public investment in infrastructure and the government has also benefitted from high levels of foreign aid from its partners in the international community (averaging near 11% of GDP since the mid-1990s)(Flores, 2013).

The Ethiopian economy had exhibited 9.8 percent average annual growth during 2010/11-2015/16, registered 8 percent growth in 2015/16 despite challenging macroeconomic and weather conditions. The 8 percent real GDP growth was 3.2 percentage point lower than base case scenario GTPII target set than 1.6 percent average growth estimated for Sub-Saharan Africa. The growth in real GDP was mainly attributed to 8.7 percent growth in services, 2.3 percent in agriculture, and 20.6 percent in industrial sectors. Nominal GDP per capita rose to USD 794 from USD 725 a year earlier depicting a 9.5 percent improvement(National Bank of Ethiopia, 2016). The real GDP growth of Ethiopia, at 7.7% in 2017/18, is expected to strengthen to 8.5% in 2018/19. However, only gradual alleviation of the foreign shortages and continuing restraint on public investment(International Development Association &International Monetary Fund, 2020).

The Ethiopian economy has continued to record strong growth. Though, challenges arising from both internal and external influences. External influences were largely related to the international commodity prices and decreasing net services which led to a widening current account deficit while domestic factors contained growing demand for foreign exchange to finance mega projects and a comparatively higher rate of inflation. Besides, the government is the main source of the deficit, and the federal budget operation within the second quarter of 2019/20 resulted in an overall deficit (including grant) of Birr 6.7 billion, compared with Birr 22.9 billion deficits recorded a year ago. This deficit was financed by net external borrowing and residuals(National Bank of Ethiopia, 2019). Moreover, a problem in Ethiopia's economy is also has been plagued by a history of drought and famine, including major famines from 1973-74, 1983-85, and most recently, the drought of 2015-2016, one of the worst in decades(Zachary et al, 2017).

Ethiopia has been the second-most populous country in Sub-Saharan Africa, gross national income per capita has been steadily increasing in recent years. According to 2008 World Bank estimates, GNI per capita has increased from USD 490 in 2003 to USD 870. GDP growth rates reflect this improvement, with average rates consistently exceeding 10 percent from 2004 to 2008. However, the country still has a long way to go in the development process and continues to face considerable obstacles. Ethiopia was one of the most food aid-reliant countries in the

world in 2000. More recently, the government has face a rising inflation problem. In 2008, inflation stood at 29.1 percent and rose to 36.4 percent in 2009(World Bank, 2010).

The inadequacy of the domestic economy to expand domestic revenue sources to finance the deficit by itself also makes inflows of foreign capital a vital basis to alleviate the challenge. Thus, the existence of these resource gaps in one way shows that the domestic economy is not accomplished in generating enough finance to close these gaps. This has caused the country to reliance on foreign aid to fill the saving-investment gap, trade gap, and fiscal gap by improving domestic savings required for investment(Migbaru, 2013). The World Bank database shows that net ODA as a percentage of gross national income (GNI) in Ethiopia is high relative to many developing countries (13.43% on average from 2000-2010 reaching a peak of 19.15 in 2003)(Woldekidan, 2015). However, Foreign aid is forecast to decline (as a percent of GDP) over the next five to ten years. For instance share of official development assistance to GDP are 8.17% and 5.04% in 2012 and 2020 respectively(Organization for Economic Corporation and Development, 2020).

The target of the donors in providing aid is to fill the saving-investment gap, the foreign exchange gap, the fiscal gap and thus help the country to realize the economic process and poverty reduction. The donor also expects that if aid is employed properly, it can increase savings and investment, reduce foreign exchange constraints, and increase economic growth(Tesfahun,2014). However, Ethiopia being one of the major receivers of economic aid from different countries and organizations suffers less economic process and poverty remain inherent for several years and also the real role of aid has not a crucial influence on Ethiopian economic growth(Haile, 2015). Generally, several studies have been carried out to evaluate the impact of foreign aid on economic growth in LDC's and Ethiopia and come with different results and policy implications. Thus, the researcher has been motivated to examine the causal linkage between foreign aid and economic growth in Ethiopia.

1.2.Statement of the Problem

Foreign capital inflows are receiving due attention because of their potential to finance investment and are perceived to promote economic growth in the recipient country(Adeola, 2017). The growing divergence in saving and investment rates, foreign exchange constraints to

import capital goods, and budget deficits in developing countries make them depend highly on the inflow of foreign capital(Yordanos, 2018). Despite the enormous flow of foreign aid to developing countries, the economic growth achieved and living condition which is assumed to be highly affected by the inflow of foreign aid by many Sub-Saharan African countries and has not been satisfactory and remained poor(Belay & Girma, 2018). Thus, the actual role of foreign capital inflow has been an area of controversy(Gitaru, 2016).

Foreign aid is one of the prominent sources of finance for developing countries in Africa in general and Ethiopia in particular. Ethiopia has been receiving foreign capital especially foreign aid for bringing high economic growth like other developing countries, but, it is one of the poorest countries in the world, with very low human development indicators, ranked 174th out of 188 countries(African Development Bank, 2016). Ethiopia suffers from low levels of domestic saving, a budget deficit that required external assistance to enhance economic growth, and an insufficient amount of foreign exchange required for purchasing capital goods. Thus foreign aid could answer this problem by supplementing domestic saving or foreign exchange reserves(Asaye, 2017). However, the role of foreign aid in the growth process and its implication in developing countries has been a topic of intense debate.

There are many studies conducted on the link between foreign aid and economic growth in Ethiopia. However, there are conflicting findings regarding the relationship between foreign aid and economic growth in Ethiopia. For instance, (Yohannes, 2011; Mohammed, 2012; Tesfahun, 2014; Fentaye, 2015;Wendimu, 2018)found that foreign aid has a positive impact on the economic growth of Ethiopia, while other researchers such as (Tasew, 2011; Kitessa, 2012; Haile, 2015; Asaye, 2017; Tefera, 2017; Gadisa et al., 2018; Belay & Girma, 2018)show that foreign aid hurts economic growth of Ethiopia. Therefore, this empirical finding indicates that the studies on this topic are an area of controversy and inconclusive. Concerning the direction of causality, the empirical results indicate that there is no clear-cut conclusion on the direction between foreign aid and economic growth. Most of the studies have failed to address the causality between the variables and economic growth in both the short-run and long run. However, the study by Tesfahun (2014) found the presence of Uni-directional causality from foreign aid to economic growth in Ethiopia.

As shown above, many researchers examined the cointegration relationship between variables in long run, but testing and detecting the long-run cointegration relationship between variables did not provide sufficient information. So it is important to examine the direction of causality between variables. Therefore, the present study has performed the causal linkage between foreign aid and economic growth in Ethiopia by including updated data for the period 1981 to 2020 in Ethiopia.

1.3. Objectives of the Study

1.3.1. General Objective of the Study

The general objective of this study is to examine the causal linkage between foreign aid and economic growth in Ethiopia.

1.3.2. Specific Objectives of the Study

Particularly, the study aims at achieving the following objectives:

- To describe the trend and performance of foreign aid and economic growth in Ethiopia.
- To identify the long-run and short-run impact of foreign aid on economic growth in Ethiopia.
- To identify the direction of causality between foreign aid and economic growth in Ethiopia.

1.4.Hypothesis of the Study

Based on empirical literature on the relationship between foreign aid and economic growth in Ethiopia, the author proposes the following relationships to hold in the analysis.

HO_1: There is no long run and short-run impact of foreign aid on economic growth in Ethiopia

HO_2: There is no strong long-run and short-run causality between foreign aid and economic growth in Ethiopia

1.5.Significance of the Study

After it is completed this study is to be significant in the following aspects. Firstly, it improved the practical knowledge and skill of the researcher of this study by making familiar with truthful evidence on the study topic and related macroeconomic issues. Secondly, it produces general information on the relationship between foreign aid and economic growth. Thirdly, it will serve as a base ground and reference for further studies on foreign aid and economic growth. At last

but not least it generates pieces of evidence for policy implications and recommendations that aim to analyze the relations of foreign aid and economic growth in Ethiopia.

1.6.Scope and Limitations of the Study

The geographical scope of the study is delimited to the political boundary of Ethiopia. It considers only the main macroeconomic factors that affect economic growth in Ethiopia. The study limited itself only to the causal linkage between foreign aid and economic growth in Ethiopia which covers the annual data for all respective economic variables for 40 years from the period 1980/81 up to 2019/20 because of the limitation of data before 1981. The variables used in this study include one dependent and nine independent variables. The dependent variable representing the growth of real GDP and the nine explanatory variables namely gross capital formation, human capital, export, foreign aid, squared foreign aid, external debt, inflation rate, political instability, and drought. The limitation of this study was the one associated with data availability. There are shortages of data, particularly, on export and physical capital before 1981. The most challenge while doing this study came from the inconsistency of data from different organizations. To avoid such inconsistency attempt is made to stick to the same source of data.

1.7. Organization of the Paper

This paper is structured as follows. Chapter two summarizes in brief theoretical and empirical literature reviews are presented. Chapter three presents the methodology of the study such as data sources and type, method of data analysis, model specification, and estimation procedures are used to identify the relationship between foreign aid and economic growth in Ethiopia. Chapter four presents descriptive, empirical results of the ARDL estimation, and VECM Granger causality test. Finally, Chapter five concludes and provides policy recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Theoretical Literature Review

2.1.1 Definition of Foreign Aid

Foreign aid is financial or technical help given by one country's government to others countries to support social and economic development or to respond to a disaster within the country. It can involve providing financial grants or loans, technical advice, training, equipment, and commodities such as food, health, infrastructure, and transport(Todaro & Smith, 2012). The most commonly known measure of aid for international development purposes is Official Development Assistance (ODA) and in 1969, the Organization for Economic Co-operation and Development (OECD) established 'Official Development Assistance as a distinctive definition to measure and compare how well the efforts of donor governments, who provide the financial or technical assistance, meet international development objectives(Wells, 2013).

Government aid that is designed to promote the economic development and well-being of developing countries is known as Official Development Assistance, but loans and credits for military purposes are not included in official development assistance. Aid could also be provided bilaterally, from donor to recipient, or channeled through a multilateral development agency such as the United Nations or the World Bank. The aid includes grants, "soft" loans, and also the provision of technical assistance. The OECD maintains a list of developing countries and territories; only aid to those countries counts as ODA. A long-standing United Nations target is that developed countries should devote 0.7% of their gross national income to ODA (Organization for Economic Corporation and Development, 2020).

Grants and subsidized loans are stated as concessional financing, whereas loans that carry market or near-market terms (and therefore are not foreign aid) are non-concessional financing. According to the DAC, a loan counts as an aid if it's a "grant element" of 25 percent, or the present value of the loan must be at least 25 percent below the present value of a comparable loan at market interest rates(Radelet, 2006). The aid flow to developing countries is classified into three different categories by the Development Assistance Committee: The first one is, Official Development Assistance (ODA) that is the largest, consisting of aid provided by donor

governments to low- and middle-income countries. The second classification is the one called, Official Assistance (OA) is aid provided by governments to richer countries with per capita incomes over approximately $9,000. Lastly, Private Voluntary Assistance is a type of aid that comprises grants from non-government organizations, religious groups, charities, foundations, and private companies(Kitessa, 2012; Yohannes, 2011).

2.1.2. Purpose of Foreign Aid

Foreign aid may be used to achieve a country's diplomatic goals, enabling it to achieve diplomatic recognition, to gather support for its positions in international organizations, or to extend its diplomats' access to foreign officials. Other purposes of aid include promoting a country's exports. Countries also provide aid to alleviate the suffering caused by natural or man-made disasters like famine, disease, and war, to push economic development, to assist establish or strengthen political institutions, and to deal with the spread of international problems including disease, terrorism, and other crimes (Williams, 2020).

The purpose of foreign aid is poverty reduction, increasing savings and investment, and also the rate of growth of GNP in developing countries (Tefera, 2017). However, donor motives for giving aid and recipient motives for accepting it conflicts with the economic objectives of aid. According to Todaro & Smith (2012), there's no historical evidence that over large periods donor countries assist others without expecting some corresponding benefits (political, economic, military) in return. This results in the non-achievement of the objectives of economic aid in many cases. Asaye(2017) foreign country donors don't seem to be simply giving the help they will retrieve opportunity and use their aid away of strengthening their relationships and take a look at to realize some precious natural resources. Most foreign donor countries have the principle of give and take away.

2.1.3. Debate on Foreign Aid

The concern of the economic effects of aid, especially public aid is fraught with disagreement. On one side are the economic traditionalists, who argue that aid has promoted growth and structural transformation in many developing countries. On the opposite side are critics who argue that aid doesn't promote faster growth but may retard it by substituting for, instead of supplementing domestic savings and investment and by worsening balance of payments

deficits as a consequence of increasing debt repayment duties and also the connecting of aid to donor-country exports. Official aid is further criticized for specializing in and stimulating the expansion of the modern sector, thereby increasing the gap in living standards between the rich and also the poor in developing countries. Some critics on the left would even assert that economic aid has been a force for antidevelopment within the sense that it both delays growth through reduced savings and worsens income inequalities. In its place of dismissing economic blocks and filling gaps, aid, and for that matter private foreign investment not only broadens current savings and foreign-exchange resource gaps but may even make new ones. Critics on the right charge that economic aid has been a failure because it's been largely appropriated by corrupt bureaucrats, has stifled initiative, and has generally produced a welfare attitude on the portion of recipient nations(Todaro & Smith, 2012).

Friedman (1958) and Bauer (1972 as cited in Tefera(2017)arguing that aid is not a requirement for the economic growth of a country, and declare that foreign assistance to governments is dangerous because it increases the ability of the elite within the recipient governments, ends up in corruption, and hinders the economic process. specifically, Bauer noted that aid discourages the expansion of private sector investments, encourages public sector-led growth(Haile, 2015).

However, some of the research that tests the hypothesis foreign aid -led growth have their conceptual foundations on early growth models. Foreign aid theories employed today are variants of the different growth and development theories. Classical economists like Adam Smith, Alfred Marshall, and David Ricardo stressed that capital is an important determinant of growth and development(Yohannes, 2011). According to Schumpeter(1954) as cited in(Gadisa et al, 2018)argues that foreign aid only leads to growth when combined with the transfer of entrepreneurship and new skills thereby enhancing the absorptive capacity of the recipient economy. Another theory that has influenced the aid effectiveness literature is the Investment Saving-Liquidity preference Money supply (IS–LM) macroeconomic theory. In the IS-LM framework, aid effectiveness is evaluated by evaluating short run and long run variations in output as a result of the amount aid inflowing the country.

2.1.4. Theories of Economic Growth and Foreign Aid

Economic growth is a synonym of the production of goods and services, the creation of jobs, and wealth. It is conventionally measured with the percentage of increase in the gross domestic product (GDP). It's conventionally measured with the proportion of increase within the gross domestic product (GDP). Therefore, GDP shows the entire value or value of all finished goods and services produced during a country's borders in an exceedingly specified period and calculated on annual basis. Measurement of economic growth uses national income accounting. Early economic process theories within the 1950s and 1960s stressed that the fundamental problem for several developing countries was precisely capital formation in achieving the economic process. Thus these theories were within the view that development assistance was important for these countries to fill the finance gap and technology gap. More popularly, these gaps were referred to as the saving gap and therefore the trade gap(Asaye, 2017).

The sub-sections that follow are looking at a number of the theories explained within the literature.

A. Harrod-Domar model

The Harrod -Domar growth model supposedly died long ago. But still today, economists within the International Financial Institutions apply the Harrod-Domar model to calculate short-run investment requirements for a target rate of growth. They then calculate a Financing Gap between the specified investment and available resources and infrequently fill the Financing Gap with economic aid. The Financing Gap Model has two simple predictions: (1) aid will go in investment one for one, and (2) there will be a hard and fast linear relationship between growth and investment within the short-run(Haile, 2015). This model explains the economic process in terms of a savings ratio and capital-output (Easterly, 2003). The model expressed as follows:

$$g = \frac{I}{ICOR} \quad \text{..... (2.1)}$$

The incremental capital-output ratio (ICOR) represents the ratio of additional investment to additional output, g is the rate of the economy, and that I 'represents investment (which is equated to savings). Therefore, with the ICOR remaining constant, the speed of the economic

process is going to be directly determined by the speed of investment. With investment assumed to be up to savings, this involves that a poor country, with low savings, will have low investment and hence low growth and it's thus expected that supplementation of domestic savings by aid will resort to a rise in investment, and hence economic growth(Tesfahun, 2014).

B. The Neo-Classical (Solow) Growth Model

School of thought and theories on the economic process may be traced back to the classical economists of the eighteenth and nineteenth century, whose works are briefly reviewed alongside the transition to neo-classical growth theory. The essential framework of neoclassical growth models states that, at any point in time, the whole output of the economy depends on the standard and quantity of physical capital employed, the number of labor employed, and therefore the average level of skills of the labor. However, once the economy reaches the total equilibrium level, additional growth within the stock of capital per worker will only occur if productivity increases, either through enhanced capital stock or through improvements within the quality of the labor. The fundamental assumptions of the Solow model include constant returns to scale, diminishing marginal productivity of capital, exogenously determined technical progress, and substitutability between capital and labor(Tewodros, 2015).

The Solow growth model shows that within the long term, an economy's rate of saving determines the scale of its capital stock and thus it's level of production. The upper the speed of saving is that the higher the stock of capital and also the higher the extent of output and a rise in the rate of saving causes a period of rapid growth, but eventually that growth slows because the new steady state is reached. Thus, although a high saving rate yields a high steady-state level of output, saving by itself cannot generate persistent economic growth(Mankiw, 2013).

Based on his growth model, high investment rate (saving rate), high level of technology, skilled human capital, low level of population growth, and low rate of capital depreciation are the foremost determinants of economic process within the long run.

According to this simple mathematical model, economic growth can be measured as follows:

$$\triangle \mathrm{Yt} = \frac{\partial \mathrm{Y} \triangle \mathrm{Kt}}{\partial \mathrm{K}} + \frac{\partial \mathrm{Y} \triangle \mathrm{Lt}}{\partial \mathrm{L}} + \frac{\partial Y \triangle \mathrm{At}}{\partial A} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (2.2)$$

When we divide both sides of equation (2.2) by Yt it becomes that:

$$\frac{\Delta Yt}{Yt} = \frac{\partial Y}{\partial K}\frac{\triangle Kt}{Yt} + \frac{\partial Y}{\partial L}\frac{\Delta Lt}{Yt} + \frac{\partial Y}{\partial A}\frac{\triangle At}{Yt} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.3)$$

The above equation decomposes GDP growth into portions that can be attributed to growth in the capital stock, the labor force, and the technology level. Then

$$\frac{\partial Y}{\partial K} * \frac{\Delta K}{Yt} = \frac{\partial Y}{\partial K} * \frac{Kt}{Yt} * \frac{\Delta K}{Kt}$$

$$= \beta k \frac{\Delta K}{Kt}$$

$$= \beta k g k$$

Using the same methodology for labor and technology, the reduced form of Equation [2.3] in growth form is as follows.

$$gy = \beta kgk + \beta kgL + \beta AgA \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.4)$$

Or $\beta AgA = gy - (\beta kgk + \beta LgL) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.5)$

Since Solow's growth model assumption was a constant return to scale and perfect competitive market, the summation of the share of capital and labor is a unity. So if the share of capital is β k**,** then the share of labor is 1-βk =βL and the above equation can be rewritten as:

$$\beta AgA = gy - (\beta kgk + (1 - \beta k)gL) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2.6)$$

Where ***g*****y**= Growth rate of Real GDP

gk=Growth rate of physical capital

gL= Growth rate of human capital

gA= Growth rate of technology and βk, βL, βA are the marginal elasticity of capital, labor force, and technology respectively. So if we have observations on the growth rate of output, the labor force, and the capital stock, we can have an estimate on the growth rate of total factor productivity. Equation (2.5) defines as the "Solow residual" in its long-run growth model.

According to the neoclassical theory of growth, the model makes three important forecasts. First, increasing capital comparative to labor generates economic growth, meanwhile, people can be more productive given more capital. Second, poor countries with less capital per person grow faster because each capital investment produces a higher return than rich countries with sufficient capital. Third, because of diminishing returns to capital, economies eventually reach a point where any capital increase no longer creates economic growth and which is called a steady state. The neoclassical aggregate production function used in the Solow model is characterized by the constant returns to scale and the diminishing marginal returns to capital and labor. When the production function exhibits constant returns to scale, the increase in the factors of production by some equal proportion will increase the final output by the same proportion. With the increase of one of the factors of production the total output will increase but it will increase each time by a smaller amount. This means that the factor of production is characterized by diminishing marginal returns(Koutun & Karabona, 2013).

However, the Solow Model is hindered by two limitations: the inability to explain long-term growth and the assumption of diminishing marginal returns. The first limitation is that the Solow Model only describes changes in the level of growth in the long run, while the rate of growth cannot be changed. The Solow Model can be augmented with technological progress which means the economy can move onto a new growth path which experiences an increasing growth rate, however, this technology is taken as exogenous and the model fails to explain the sources of the technology. This reliance on exogenous factors without explanation of the source is perhaps the model's most serious limitation(Todaro & Smith, 2012).

C. Endogenous Growth Model

Neoclassical growth models such as the Solow and Ramsey models have decreasing returns to produced inputs; although their production functions usually have constant returns to all inputs. However, the modern growth models have emphasized the case of constant returns to produce inputs (implying increasing returns to scale in all inputs), which leads to so-called endogenous growth. The changes in the economy’s choice parameters, such as the saving rate and the stocks of inputs keen to R & D, principal to permanent changes in the steady-state growth rates in constant-returns models(Parker, 2010).

To overcome the limited long-term effects of the Solow Model; human capital is introduced into the theory and human capital is not subject to diminishing returns allowing growth to occur continuously at a rate of human capital accumulation. This addition to the growth theory changes very little, with foreign aid and policy distortions having the same impact in the short run. Though, this endogenous theory does drop the supposition of diminishing returns which permits for unbounded long-term growth. Non-diminishing returns to capital indicate that the returns on investment projects will not ever equivalent to the cost (depreciation) which permits for a profit on each subsequent investment and this endogenous model, suggests that equilibrium can be reached where continuous long-term growth exists. This means that foreign aid will increase growth well into the long run. Roomer states that growth is closely related to the level of human capital. Firms directly benefit from knowledge accumulation due to innovations and designs that allow for greater productivity. Increase foreign aid leads to greater accumulation of human capital via increase education and widespread Research and Development(Chenery and Strout, 1966).

2.1.5. The Two-Gap Model

Two gap models mainly emphasize the accessibility of savings and foreign exchange, fail to classify the distribution of savings and foreign currency as a dominant theme, and so, abandon the importance of efficient use of these resources for fuelling growth. As a result, these models assume a 1 to 1 relation between aid inflows or capital imports and investment and exclude all other potential uses of the resources; assume the capital-output ratio to be constant which in turn means a constant average and marginal productivity of capital; take production factors as non-substitutable(Bender, 2005).

Edward & Karamuriro(2020) The two-gap theory states that investment effort in poor countries in the early stages of development is restricted by two constraints: First, due to poverty, these countries are unable to save adequately from current income to provide the investment needed to achieve a target rate of economic growth. Second, investment and output are restricted by the inaccessibility of sufficient amounts of imported inputs due to a foreign exchange constraint.

External finance is a serious role in adding domestic resources to relieve savings, and the basic argument of the two-gap model is that most developing countries expression whichever a lack of domestic savings to match investment chances or a deficiency of foreign exchange to finance needed imports of capital and intermediate goods. In another way, the two-gap model was the standard theory to explain aid and the first gap covers the relationship between the quantity of investment essential to reach a certain growth rate and available domestic savings. While the second gap is between foreign exchange rates and import requirements for fixed production levels. The two-gap model designates that loans and grants improve domestic resources through foreign exchange blockages. Decreased domestic savings creates investment opportunities for countries while the scarcity of foreign exchange increases the country's imports of necessary intermediate goods and capital. Foreign aid inflow fills both the Savings gap and foreign exchange gap at the same time and therefore independent; meaning that only one of the two can be practical in the recipient country during a specific time frame. If the recipient country follows the foreign exchange gap, economic growth occurs depending on the surplus of productive resources that are often used to import capital and intermediate goods(Todaro & Smith, 2012).

2.2. Empirical Literature

This has been the center of various empirical studies. Studies are undertaken on the actual impacts of foreign aid on growth came with contradicting results some favoring its impact by getting the positive relationship between the two though others disagree with this result and others found no impact. Therefore, the following are some of the empirical kinds of literature review systematically.

2.2.1. Empirical Studies in other Countries

Tekin(2012)Examined causal relations between development aid, openness to trade, and economic growth in the Least Developed Countries (LDC), for the period between 1970 and 2010. The result failed to find a strong empirical indication in neither of the causality directions studied. The findings disprove the effectiveness of development aid provided to the group of LDCs and found no case in which development aid hurts economic growth per capita.

Moolio & Kong (2014)Examined Foreign aid and economic growth of panel cointegration analysis for Cambodia, Lao PDR, Myanmar, and Vietnam by applying panel cointegration tests.

The study estimated the magnitude of the long-run relationship between aid and economic growth using panel data from 1997 to 2014. This study results exposed that foreign aid is a positive impact on economic growth, and one of the successful strategies for poverty reduction in the sample of four countries from the ASEAN region.

Yiew & Lau(2018)examined the impact of foreign aid on economic growth using data for 95 developing countries. The association presented a U-shape among foreign aid and economic growth. Results indicated that GDP is less likely to depend on ODA. This certainly refutes the claim on the dependency notion from the receiver's countries onto the donors. This does not suggest that aid does not help growth but rather statistically, it was not the most important determinant of growth for these panels of countries. Concluded that Strengthening the legal framework would be vital for these countries through their overdependence on the influx of ODA might lead to negative impacts on the growth as a whole. Highly, effective management of foreign aid would ensure the Sustainable Development Goals (SDG) is achieved.

Mahembe&Odhiambo(2019)examined Foreign aid, poverty, and economic growth in developing countries by employing a dynamic panel data causality analysis. The result found that there are both the short-run and long-run Granger causality results, and confirming that causality runs from GDP per capita and poverty rate to foreign aid. The short-run causality from GDP per capita to ODA suggests that donors mostly consider this variable in their short-term foreign aid allocation. The long-run combined causality for poverty and GDP to ODA suggests that aid is generally allocated to developing countries with high levels of poverty and lower GDP per capita.

Pradhan & Phuyal(2020) have examined the impact of foreign aid on economic growth in Nepal by considering time series data of the last forty years from 1975/76 to 2015/16. The study used a partial adjustment model to analyze the impact of foreign aid on economic growth and applied the Chow test to examine whether there is a structural breakthrough in the economy. The results indicated that foreign aid has a positive relationship with GDP; however, the relation is not significant meanwhile higher volume of foreign aid seems to be used in social and humanitarian well-being rather than production activities in the actual subdivisions. In the case of foreign assistance, the foreign loan has increased tremendously as compared to foreign grants and this has increased the burden of debt on future generations.

Edward & Karamuriro(2020)examined the effects of foreign aid on the economic growth of Uganda by using annual time series data for the period, 1970-2017. An empirical model is estimated using the Autoregressive Distributed Lag (ARDL) approach to cointegration and results designated that foreign aid inflow significantly reduced economic growth in Uganda in the short run and long run or foreign aid inflow is significant but negative at 1% level, implying that in the short run aid inflow reduced output probably due to the reconstruction period after the war where almost all inputs were imported.

Siavhundu(2020)analyzed the link between foreign aid and economic growth and the result indicated that Foreign aid was negatively influencing economic growth. The negative impact of foreign aid on economic growth may imply that Zimbabwe needs not to depend on foreign aid as this dependency instead retards economic progression.

Duru et al (2020)Found that foreign aid did not contribute to economic growth in Nigeria and also, the macroeconomic policy environment did not contribute to economic growth in both the short-run and long run. However, foreign aid of the previous year exerted a positive and significant relationship with economic growth contrary to the results of the long-run equation. The result implied that foreign aid contributes to economic growth in the short-run in Nigeria. Furthermore, the results revealed that the impact of foreign aid on economic growth in Nigeria was contingent on the quality of the macroeconomic policy environment.

2.2.2. Empirical Studies in Ethiopia

There are different conflicting kinds of literature in Ethiopia on the impact of foreign aid whether it is pro-growth or not is reasonable. Below are the summaries of empirical literature reviews on the relationship between foreign aid and economic growth in Ethiopia.

Tasew (2011)examined foreign aid and economic growth in Ethiopia by using cointegration analysis from a time series data covering the period 1970 to 2009. The result found that Foreign aid has a positive impact on economic growth**.** However, the aid policy interactive term has a significant negative impact, which makes the overall impact negative and this implication of negative effect is due to the presence of a poor policy environment in the country. Place contrarily; inefficient policy devices diminish the positive effect of aid on economic growth.

Yohannes(2011)examined the impact of foreign aid on economic growth by using the Harrod – Domar model with maximum likelihood estimation and the result indicated that in the long run foreign aid has a positive impact on economic growth and through its significant influence on investment and import. In another way, the study concluded that 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, and in the short run aid has a significant impact on government consumption expenditure, which confirms the existence of aid fungibility.

Tesfahun(2014) Examined the Foreign Aid and Economic Growth in Ethiopia by applying Johansen's cointegration technique and granger causality test and found that the effect of foreign aid on economic growth is negative in the short run and becomes positive in the long run. The long-run estimated equation of economic growth revealed that foreign aid has a significant positive impact on growth, but negative insignificant in the short run indicating that most of the foreign aid has been used to finance investment which has a long gestation period. Moreover, He found that there exists a causality of foreign aid to economic growth while a reverse causality was not observed.

Fentaye(2015)has examined the impact of foreign aid on economic growth in Ethiopia over the period 1974 to 2013 using multivariate cointegration analysis. The empirical result from the growth model showed that aid has a significant positive impact on growth in the long run. The aid-policy interaction term also has a significant positive effect on growth indicating that the effectiveness of aid would have been higher if it was sustained by a sound macroeconomic policy environment. The study indicated also that the country has no problem of capacity constraint as to the flow of foreign aid.

Haile (2015) examined the impact of foreign aid on economic growth in Ethiopia using time series data for the period 1974 to 2011 and the Autoregressive Distributed Lag (ARDL) approach to co-integration was applied. He found that the negative coefficient of separate foreign aid in the regression model showed that foreign aid harms economic growth, but the positive coefficient of aid policy index interaction showed that foreign aid has positively contributed to economic growth in Ethiopia if complemented with a stable macroeconomic policy environment.

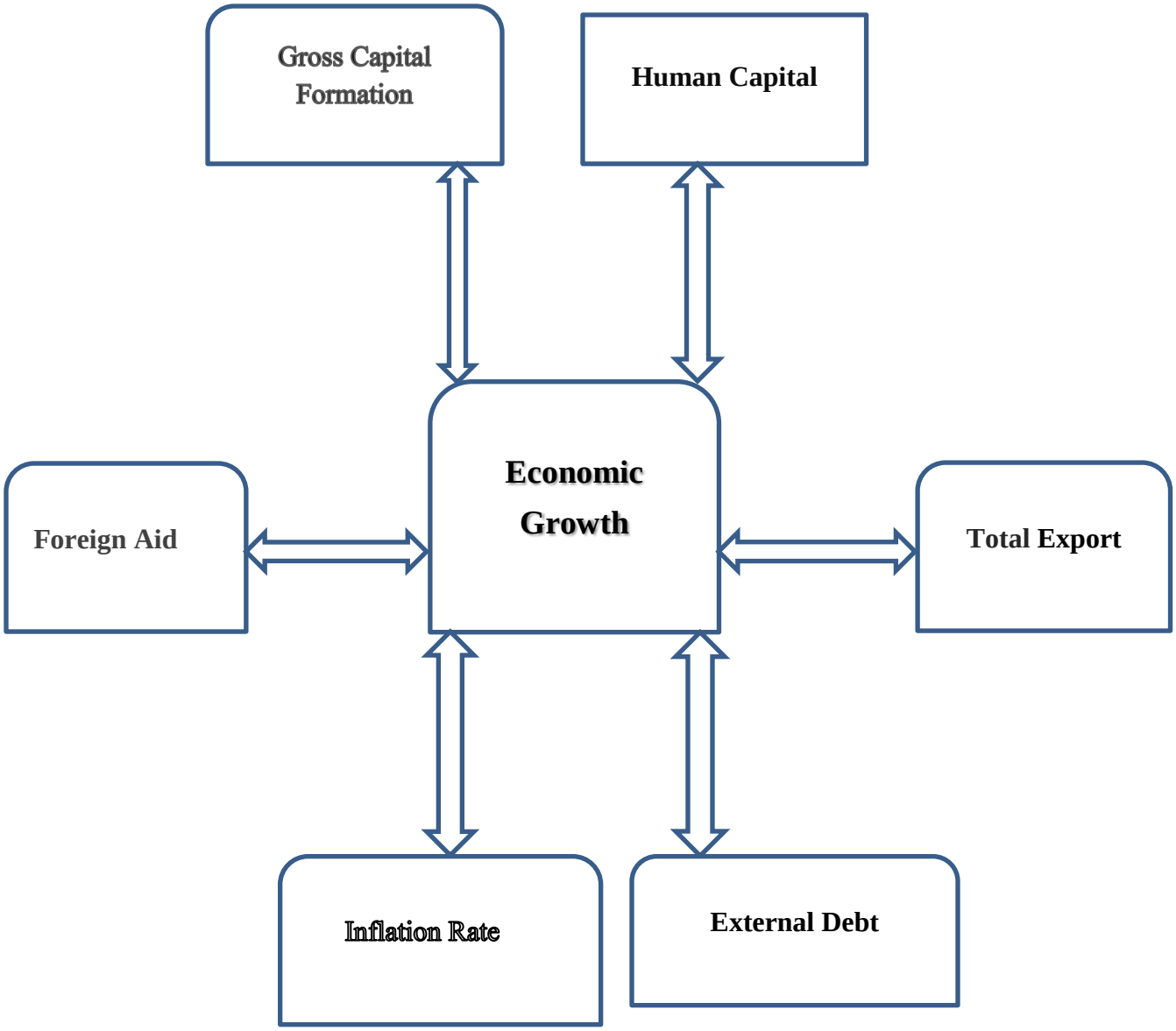
Gadisa et al (2018) examined the Foreign aid and Economic growth in Ethiopia on the two-gap model Approach and Autoregressive Distributed Lag (ARDL) estimation techniques for the period 1981 to 2015 were used. The bound test for cointegration found that foreign aid has a negative and significant impact on per capita income growth in the long run. Foreign aid also a positive and significant effect on investment and growth equations and transmission equations, but the negative and significant effect on per capita income growth showed that the import financed by aid is more of noninvestment goods and outweighs the investment. Concluded that import is financed by aid but that import does not contribute to per capita income growth in the long run and foreign exchange gap is the binding constraint with the two-gap model.

Belay & Girma (2018)analyzed the impact of foreign aid on economic growth by using the Autoregressive distributed lag Approach to cointegration and Error Correction Model from time-series data of 1974 to 2017. Their result indicated that foreign aid harms economic growth in both the long-run and short-run.

The above-reviewed literature indicated that some researcher's results showed that there is a positive relationship between foreign aid and economic growth in Ethiopia. Whereas others found that there is a negative relationship between foreign aid and economic growth. On another hand, from the reviewed literature many scholars used the cointegration test to examine the cointegration between variables in long run but this did not show the direction of causality rather than the only causality in one direction. Therefore, the reviewed literature indicated that there is no agreeing link between foreign aid and economic growth and most of these studies failed to conduct the causality analysis except(Tesfahun, 2014) performed causality analysis and found that there is unidirectional causality from foreign aid to economic growth in Ethiopia.

2.3. Conceptual Framework

The study conducts based on the conceptual framework which draws from the above theoretical and empirical literature reviews. This research focuses on studying the major macroeconomic determinants that are critical to economic growth in Ethiopia. From the literature review mention above the study develops the following schematic representation of the conceptual framework/model for this study which shows the relationship between the major macroeconomic variables and economic growth.



Source: **Derived from the empirical and theoretical literature**

The arrow from the above diagram shows that the existence of a bi-causal relationship between economic growth and mentioned variables. This means that each variable affects economic growth and economic growth also affects these variables in turn. On one hand, the growth of those variables increases or decreases economic growth and the growth of one's economy contributes positively or negatively to other variables on the other hand. But, the ARDL bound test approach to co-integration shows only the Uni-directional relationship between economic growth and its determinant variables.

CHAPTER THREE

METHODOLOGY OF THE STUDY

3.1. Data Sources and Types

The study was based on time series country-level macro-data covering the period from 1980/81 to 2019/20. The choice of the period is based on the availability of relevant data for the study. This study is based on secondary sources of data. The data for gross capital formation, human capital, total export, external debt, and inflation rate were collected from the National Bank of Ethiopia (NBE). Real GDP data were collected from the National Bank of Ethiopia, and Ministry of Finance and Economic Development (MoFED), and Official development assistance were collected from the World Bank database(Organization for Economic Co-operation and Development (OECD)) because there is a common belief that data on foreign aid from the Organization for Economic Co-operation and Development (OECD) are more dependable since they are collected straightforwardly from the donors with a better system of recording than Ethiopia(Duru et al, 2020). The data used for this study are both a quantitative and qualitative data type. Since most time-series analyses are quantitative and more variables used in this study are macroeconomic variables which are expressed in quantitative terms and only political instability and drought has are expressed qualitative terms.

3.2. Methods of Data Analysis

The study was used both the descriptive and econometric methods of data analysis. Graphs is descriptive statistical methods used to explain trends of the variables used in the model. The econometric tools such as the Augmented Dickey-Fuller (ADF) test, the estimation of ARDL model, bound cointegration test, vector error correction models (VECM), and Wald test are used for this data analysis. First, the ADF test is used to examine the stationarity of the variables. Second, the bound cointegration test is used to identify the existence of the long-run relationship between variables. Third, the estimation of the ARDL model was used to examine the long-run and short-run impact of independent variables on the dependent variable. Fourth, with the presence of the cointegration, the VECM is applied to identify the direction of causality in the long run and the Wald test is employed to identify the short-run causality between the variables used in the study. Finally, interpretation of results is based on econometric model results were

included. To estimate the models and to perform the pre-estimation and post-estimation diagnostic tests, Eviews11 packages are used.

3.3. Model Specification

The neo-classical Solow growth model clarifies economic growth as resulting from the combination of two elements namely capital and labor. However, Lucas extended the Solow growth model by including one more variable that explains economic growth, which is human capital. Apart from capital and labor, Solow decomposes the growth in output into three components capital, labor, and total factor productivity(Sharipov, 2015). However, macroeconomic theory has identified various factors that influence the growth of a country from the classical, neoclassical, and new growth theories in addition to the labor force, physical capital accumulation, and human capital. These factors include natural resources, innovation, technology, economic policies, governmental factors, foreign aid, trade openness, institutional framework, FDI, political factors, socio-cultural factors, geography, demography, and others (Asaye, 2017).

To analyze the relationship between foreign aid and economic growth, the researcher was employed the augmented Solow growth model in which output is a function of the stock of capital, labor, human capital, and technology(Solow, 1956) as cited in(Belay & Girma, 2018). As reviewed by Grandville(2007) the augmented Solow (1956) growth model can be specified as:

$$Yt = At\, Kt^{\alpha} Lt^{\beta}\, Ht^{\gamma} \quad \ldots\ldots (3.1)$$

Where *Y* is the output flow, A is Technology, *L* is labor force, *K* is capital stock and *H* represents human capital. Following broadly the approach of augmented Solow growth model, studies such as Biswas & Saha(2014) in India and Asaye(2017); Tewodros(2015) & Tefera(2017) in Ethiopia applied similar economic function to analyze macroeconomic determinants of economic growth. These studies did specify their economic growth function to their respective country as Real GDP is a function of physical capital, human capital, exports of goods and services, foreign aid, external debt, and inflation. They preferred these variables based on their relevance and data availabilities. According to Tewodros (2015) the relationship between real GDP and its major macroeconomic determinant in Ethiopia expressed as follows:

$Yt = F(GCFt, HCt, EXTt, AIDt, EXDt, INFt,)$…… (3.2)

Where Yt represents real GDP at a time t, GCFt represents physical capital (gross capital formation) at a time t, HCt represents human capital proxies by expenditure to health and education, EXTt stands for total export, AIDt represents for foreign aid, EXDt is for external debt and INFt for the general inflation rate at time t.

However, theoretical and empirical studies show that these are not the only determinants of economic growth. There are also other factors such as drought and political instability. Therefore this study incorporates these additional variables on the above model.

With some modification the researcher was used model is expressed as follows:

$Yt = F(ODAt, ODAt^2, GCFt, HCt, EXTt, EXDt, INFt, DUM1t, DUM2t)$……..……..… (3.3)

Where Yt =represents a proxy for change in real GDP growth (Constant 2010 US$ =100) at a time t,

ODAt= represents for foreign aid proxies by official development assistance as % of GDP at time t,

ODA^2t= represents squared official development assistance as % of GDP at time t,

GCFt= represent physical capital (Gross capital formation) at a time t,

HCt =represents human capital proxies by expenditure to health and education,

EXTt=stands for total export of goods and services at time t,

EXDt =is for the external debt at time t

INFt =for the general inflation rate at time t.

DUM1t=dummy for political instability (1, represents the years of political instability and 0, represents the years of no political instability).

DUM2t= represents dummy for drought (1, represent the years of drought and 0; represent the years of no drought). Therefore this study incorporated these additional variables on the above model.

Since it is a Cobb- Douglass production function it is specified as:

$$\mathrm{Yt} = \mathrm{F}\left(\mathrm{A}, \mathrm{ODA}^{\beta1}, ODA^{2^{\beta2}}, \mathrm{GCF}^{\beta3}, \mathrm{HC}^{\beta4}, \mathrm{EXT}^{\beta5}, \mathrm{EXD}^{\beta6}, \mathrm{INF}^{\beta7}, \mathrm{DUM1}^{\beta8}, \mathrm{DUM2}^{\beta9}\right) \ldots\ldots\ldots(3.4)$$

From the beginning, the researcher has transformed some the variables under study into Log data to avoid heteroscedasticity(Gujarati, 2004), and to show elasticity of the variables.

Taking the logarithms on both sides of the above equation, it is reformulated as follows:

$$\triangle \mathrm{Ln\,RGDPt} = \beta0 + \beta1\,\mathrm{ODA}(t-1) + \beta2\,\mathrm{ODA}^2(t-1) + \beta3\mathrm{lnGCF}(t-1) + \beta4\,\mathrm{LnHC}(t-1) + \beta5\mathrm{lnEXT}(t-1) + \beta6\mathrm{LnEXD}(t-1) + \beta7\,\mathrm{INF}(t-1) + \beta8\mathrm{DUM1}(t-1) + \beta9\mathrm{DUM2}(t-1) + \mathrm{Ut} \ldots\ldots (3.5)$$

Where:ln RGDPt) = Logarithm of real GDP at time t; ODA=Official Development Assistance; Ln(GCF)=natural logarithm of gross capital formation; Ln(HC)=natural logarithm of Human capital; ODA^2 =Squared official development assistance; Ln(EXT)= Natural logarithm of export of goods and services; Ln(EXD)=natural logarithm of External debt stock; INF= General inflation rate; DUM1= Dummy for political instability; DUM2=Dummy for drought; Ut= error term at time t, and $\beta0, \beta1, \beta2, \beta3, \beta4, \beta5, \beta6, \beta7, \beta8,$ and $\beta9$ are coefficients that measure the long-run and short-run relationship of independent variables with real GDP in this specified model. Because of highly skewed values, the variables RGDP, GCF, HC, EXD, and EXT were logged. The logarithmic transformation was meant to transform them into a data set that is more normalized to avoid the problem of heteroscedasticity. Since official development assistance, squared official development assistance, inflation rate, a dummy for drought, and a dummy for political instability were not expressed in logarithms because their values were not highly skewed. The equation (3.5) above is expressed in a log-linear form. Thus the interpretation shows elasticities.

3.3.1 Variable Descriptions and Expected Sign

Real GDP: is the measure of a country's final output at the constant price at a given point in time. It measures the total income of the country in real terms(Todaro & Smith, 2012). Since most economists argue that economic growth can be measured as growth in real GDP, it includes the model as a main dependent variable to measure economic growth. Therefore, the researcher was used economic growth as a proxy to Real GDP Constant 2010 US$.

Foreign Aid (ODA): is defined as government aid that promotes and specifically targets the economic development and welfare of developing countries. Note that, aid for military and other non-development purposes is excluded(Organization for Economic Co-operation and Development, 2016). The researcher used foreign aid as a proxy by ODA as % GDP. The expected sign of this variable is to be positive.

Squared Foreign Aid (ODA^2): This takes into account whether there is diminishing return to foreign aid, which can help assess whether the aid-growth relationship is non-linear(Fentaye, 2015). The diminishing returns to aid hypothesis assume that an inflow of aid, above a certain threshold level, starts to have negative effects. The expected sign of this variable is to be negative.

Gross Capital Formation (GCF): defined as the domestic investment in a country or it refers to the net increase in physical assets (investment minus disposals) within the measurement period. It is used as an indicator of capital used in the aggregate production function (Tefera, 2017). The expected sign of this variable is to be positive.

Human Capital (HC): is the collection of skills, knowledge, or other intangible assets of individuals that can be used to create economic value for the individuals, their employers, or their community. In another way, human capital accumulation is the ability of individuals to solve problems and to think critically is believed to promote higher growth by improving the labor force which will be more productive(Mankiw, 2013). It is difficult to measure human capital in economics. As a result, researchers use different proxy to human capital (i.e. school enrolment like primary, secondary, tertiary level or literacy rate and life expectancy; expenditure to education and health) to indicate as major determinants of economic growth in the long term.

Therefore, this study has used expenditure on health and education as a proxy of human capital. The sign is also expected to be positive.

External Debt (EXD): is the portion of a country's debt that was borrowed from foreign lenders including commercial banks, international financial institutions like IMF, WB, and African Development Bank (ADB), etc., and the government of foreign nations. These loans, including interest, must usually be paid in the currency in which the loan was made. Even though there is fast economic growth, Ethiopia is challenged in financial problems to finance its mega project. For this reason, the Ethiopian external debt will increase from time to time(Asaye, 2017). As a result, it is the researcher's interest to include in this study in analyzing its effect on economic growth and would be expected a negative sign.

Total Export (EXT): is defined as the total exports of goods and services to the rest of the world. The export of a country is one of the macroeconomic determinants of economic growth(Tewodros, 2015). For this reason, this variable is entered as explanatory to analyze its effect on Ethiopian economic growth. The expected sign of this variable is to be positive.

General Inflation rate (INF): defined as an increase in the overall price level in a country and measured in percent. In Ethiopian history, inflation was not a problem of economic growth. However, starting in 2008 it is a serious problem(Wendimu, 2018). Therefore to analyze its effect on economic growth, it is the interest of the researcher's, which is included in this study as an independent variable. The coefficient of this variable would be expected a negative sign.

Political Instability (DUM1): is defined as the probability of a change in the government and the possibility that can execute power ineffectively. Economic growth and political stability are deeply interconnected. On the one hand, the uncertainty associated with an unstable political environment may reduce investment and the speed of economic development. On the other hand, poor economic performance may lead to government collapse and political unrest(Cervantes &Villaseñor, 2015). Therefore, the researcher is interested to take a dummy for political instability. The years of politics of a country are unstable or the year of is an internal civil war or the external wars in the country represented"1", and "0 "represented the years of political stability.

Drought (DUM2): is an extended period of dry weather without rain. This creates a water shortage that damages crops, livestock, and the environment. The economic impacts of drought (economic drought) in Ethiopia have been significant(Getachew, 2018). The study is considered drought as one variable that affects the economic growth of Ethiopia. This is explained in the models of economic growth in the form of dummy variables. The years of no drought are represented by "0" and for the years of drought "1" is used. Therefore, this variable is the additional variable that has been constructed by the researcher by reviewing the historical background of drought in Ethiopia from 1981 to 2020. However, many Scholars researched the link between foreign aid and economic growth but it did not include this variable as one determinant of economic growth.

Table 3. 1 Summary of Variable Descriptions, Measurement, Source, and Expected Sign

Variable's name	**Description, and Unit of Measurement**	**Source**	**Expected Outcome**
Dependent variable			
Economic growth(RGDP)	Real GDP (Constant 2010 US$) is proxy to Economic growth (measured in millions of birr).	NBE& MoFED	Not applicable
Independent variable			
Physical capital accumulation (GCF)	Gross capital formation was used as a proxy of this variable (measured in millions of birr)	NBE	Positive
Foreign aid(ODA)	Official Development Assistance (as % of GDP) as a proxy of Foreign aid	WB/OECD	Positive
External debt(EXD)	External debt Stock (measured in millions of birr).	NBE	Negative
Human capital(HC)	Expenditure to health and education as a proxy of human capital (measured in millions of birr).	NBE	Positive

Total export(EXT)	Exports of goods and services (measured in millions of birr).	NBE	Positive
Inflation rate(INF)	Measured in percentage	NBE	Negative
Square of foreign aid(ODA^2)	Squared Official Development assistance (as % of GDP).	WB/OECD	Negative
Political instability dummy (DUM1)	1, represent the years of political instability, and 0, the years of no political instability	Constructed	Negative
Drought dummy (DUM2)	1, represent the years of drought, and 0, the years of no drought	Constructed	Negative

3.4. Estimation Procedures

Many economic and financial time series exhibit trending behavior or non-stationary in the mean. Therefore, it is necessary to test the stability of the series before identification of the relationship between variables. The regression analysis among the variables would not be consistent and spurious regression problems. Thus the data must be transformed to stationary form before any analysis(Gujarati, 2004).

3.4.1. Unit Root Test

To test the long-run relationship between the dependent variable (real GDP) and independent variable the study applied Autoregressive Distributed Lag (ARDL) Model. Test the variables for stationarity in the econometric analysis are mandatory because time series data are rarely stationary in level forms. It is important to test for the statistical properties of variables when dealing with time-series data. The unit root tests were used to check the stationarity of the variables, and to check none of the variables are not order in two (I.e. I (2)), which is a precondition to applying Autoregressive-Distributed Lag (ARDL) model)(Peasaran et al., 2001).

The most popular strategy for testing the unit root is the Augmented Dickey-Fuller (ADF) test and Philips–Perron (PP) tests(Nkoro and Uko, 2016). However, the researcher was used only the ADF test to determine the degree of stationarity since both of them give the same result. Therefore, it is necessary to test for time series variables before running any sort of regression analysis.

The testing procedure for the ADF unit root test is specified as follows:

$$\Delta Yt = \alpha + 6t + \gamma Yt - 1 + \sum_{i=0}^{p} \lambda \Delta Yt - i + \mathcal{E}t \ldots\ldots\ldots\ldots\ldots\ldots \quad (3.6)$$

Where Yt is a time series variables under consideration in this model at time t, t is a time trend variable; Δ denotes the first difference operator; Ɛ*t* is the error term; p is the optimal lag length of each variable chosen such that first-differenced terms make Ɛ*t* a white noise.

Thus, the ADF test takes hypothesis**:**

H0: γ = 0 (time series has a unit root)

H1: γ ≠ 0 (time series has no unit root)

If the t value or t-statistic is more negative than the critical values, the null hypothesis (I.e. H0) is rejected and the conclusion is that the series is stationary. Conversely, if the t-statistic is less negative than the critical values, the null hypothesis is accepted and the conclusion is that the series is non-stationary.

3.4.2. The Autoregressive Distributed Lag Model (ARDL)

Econometricians and other researchers have established several methods to conduct time series analysis. A large number of earlier studies have used the Johansen co-integration and Engle-Granger causality technique to determine the long-term relationships between variables of interest. To estimate the long-run and short-run relationship between the dependent variable and independent variables the study applied the Autoregressive Distributed Lag (ARDL) model to co-integration and error correction depending on the degree of stationary levels of the variables. The so-called Autoregressive Distributive Lag (ARDL) also deals with single co-integration and was introduced by(Pesaran and Shin, 1999), and more extended by(Peasaran et al., 2001). This method has a certain econometric advantage in contrast to other single co-integration procedures.

First ARDL can be applied regardless of whether the underlying regressors are purely I (0), purely I (1), or mutually co-integrated(Pesaran and Shin, 1999). The second advantage of using the bounds test approach to cointegration is that it performs better than (Engle & Granger, 1987), Johansen (1991) co-integration, and(Phillips and Hansen, 1988) co-integration tests in small samples as the case in this study, while Johansen co-integration techniques require large data samples for valid estimation of the parameters. This means that the model avoids the problem of biases that arise from a small sample size. So, the researcher employed ARDL approach because relatively the sample used in the study is small. Thirdly, the estimation is free from the endogeneity problem. In this approach of Pesaran & Shin (1999) maintain that modeling ARDL with the appropriate number of lags will address autocorrelation and endogeneity problems, because different variables may have the different optimal number of lags, whereas in Johansen type models this is not permitted rather take the same lag length for all variables. According to Jalil et al(2008) as cited in (Tekilu & Jamal, 2019) no doubt on the problem of endogeneity if the estimated ARDL model is free of autocorrelation.

Fourthly, in ARDL estimation the long-run and short-run parameters are estimated simultaneously and by applying the ARDL technique we can obtain an unbiased and efficient estimator of the model(Narayan, 2004). Furthermore, the ARDL procedure employs only a single reduced form equation, while the other co-integration procedures estimate the long-run relationships within a context of system equations. Further, in using the ARDL approach, a dummy variable can be included in the co-integration test process, which is not permitted in Johansen's method according to (Rahimi et.al, 2011)as cited in (Garedew, 2016). Therefore, this approach becomes popular and appropriate for analyzing the long-run relationship and broadly applied in empirical research in recent years.

Therefore, the ARDL model can be specified as:

$$\begin{aligned}\triangle Ln(RGDPt) &= a0 + \sum_{i=1}^{p} \alpha 1 \ln(\mathrm{RGDPt} - \mathrm{i}) \\ &+ \sum_{i=1}^{p} \alpha 2\,(\mathrm{ODAt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 3\,(ODA^{2}\mathrm{t} - \mathrm{i}) \\ &+ \sum_{i=1}^{p} \alpha 4 \,\mathrm{Ln}(\mathrm{GCFt} - \mathrm{i}) \\ &+ \sum_{i=1}^{p} \alpha 5 \ln\,(\mathrm{HCt} - \mathrm{i}) \\ &+ \sum_{i=1}^{p} \alpha 6 \ln(\mathrm{EXTt} - \mathrm{i}) \\ &+ \sum_{i=1}^{p} \alpha 7 \ln(\mathrm{EXDt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 8(\mathrm{INFt} - \mathrm{i}) \\ &+ \sum_{i=1}^{p} \alpha 9\,(\mathrm{DUM1t} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 10(\mathrm{DUM2t} - \mathrm{i}) + \beta 1 \ln(\mathrm{RGDPt} - \mathrm{i}) \\ &+ \beta 2(\mathrm{ODAt} - \mathrm{i}) + \beta 3\,(ODA^{2}\mathrm{t} - \mathrm{i}) + \beta 4 \ln(\mathrm{GCFt} - \mathrm{i}) + \beta 5 \ln(\mathrm{HCt} - \mathrm{i}) \\ &+ \beta 6 \ln(\mathrm{EXTt} - \mathrm{i}) + \beta 7 \ln(\mathrm{EXDt} - \mathrm{i}) + \beta 8\mathrm{INF}(\mathrm{t} - \mathrm{i}) + \beta 9\mathrm{DUM1}(\mathrm{t} - \mathrm{i}) \\ &+ \beta 10\mathrm{DUM2}(\mathrm{t} - \mathrm{i}) + \mathrm{Ut} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots . (3.7)\end{aligned}$$

Where p denotes the lag length, Δ represents the difference operator, α0 is the drift, Ut is the disturbance term, α1, α2, α3, α4, α5, α6, α7, α8, α9, α10 are coefficients of short-run dynamics, while β1, β2, β3, β4, β5, β6, β7, β8 β9, β10 are coefficients of the long-run relationship.

Hence, the above equation (3.7**)** is the base equation for estimating the short-run and long-run relationships among the variables. In the bounds testing approach, the existence of cointegration among the variables is empirically realized through an F-test. This is merely a test of the hypothesis of no long-run relationship between RGDP and its determinants against the existence of a long-run relationship among them.

The parameters to be tested;

$H_{O:}$ β1= β2= β3= β4= β5= β6= β7= β8= β9= β10=0 (absence of long-run relationship among the variables). Alternative

$H_{1:}$ β1≠ β2 ≠β3 ≠β4 ≠β5≠ β6≠ β7≠ β8≠ β9≠ β10 ≠ 0 **(**presence of long-run relationship among the variables).

If the calculated F–statistic is less than the lower bounds of the critical values of the F-statistic, the absence of cointegration was established. However, if the computed F–statistic is greater than the upper bounds of the critical values, the alternative hypothesis of cointegration was accepted among the variables in the model, suggesting the presence of cointegration between the variables. Moreover, if the F–statistic falls between these bounds, the test is inconclusive. If the bounds test revealed the absence of cointegration among the variables, the procedure terminates. But, if the presence of cointegration were concluded among the variables in the model, the short-run and long-run impacts of each variable on economic growth respectively can be evaluated.

The standard test for a unit root is to use Augmented-Dickey (ADF). The selection of the lag length was founded on Akaike Information Criterion (AIC) which was automatically selected by E-views software. Furthermore, the researcher was not going to employ the bound critical value developed by Peasaran et al(2001) for the reason that the computed critical values are based on a large sample size (500 and more) rather, applied the bound critical values developed by Narayan (2004) which was established based on small sample size ranging from 30 to 80 observations in which Eviews automatically produce critical value with matching computed F-statistic. After the testing in which the existence of cointegration between the variables is established, the long-run and error correction estimates of the ARDL model are obtained.

Pesaran & Shin(1999), and later Narayan(2004) recommend choosing a maximum of 2 lags for annual data series. However, it is also possible to choose the maximum lag length for the dependent and independent separately thus as to avoid autocorrelation is chosen automatically in the latest version of Eviews in which was not included in the previous version. From this, the lag length that minimizes the Akaike Information Criterion (AIC) was selected. The diagnostic test was the compulsory task for the selected ARDL model to examine the validity of the short-run and long-run estimations in the ARDL model. The diagnostic test such as the Heteroscedasticity

test (Brush-pagan- Godfrey test), Serial correlation test (Brush & Godfray LM test), Normality (Jaque-Bera test), and Functional form (Ramsey's RESET) test were employed. Similar to the residual diagnostic test, the parameter stability test of the model was also conducted.

Based on Equation (3.7) the long-run elasticity's can be computed:

$$\mathrm{L}n(RGDPt) = \alpha 0 + \sum_{i=1}^{p} \alpha 1 \mathrm{Ln}(\mathrm{RGDPt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 2(\mathrm{ODAt} - \mathrm{i}) + \sum_{1=1}^{p} \alpha 3(ODA^2\mathrm{t} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 4 \ln(\mathrm{GCFt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 5 \mathrm{Ln}(\mathrm{HCt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 6 \mathrm{Ln}(\mathrm{EXTt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 7 \mathrm{Ln}(\mathrm{EXDt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 8 \mathrm{INFt} - \mathrm{i} + \sum_{i=1}^{p} \alpha 9 \mathrm{DUM1t} - \mathrm{i} + \sum_{i=1}^{p} \alpha 10 \mathrm{DUM2t} - \mathrm{i} + \mathrm{ut}. \quad \text{.....(3.8)}$$

An error correction model related to the long-run estimates was estimated to find the parameters of short-run dynamics, and causality is established using an error correction model associated with the long-run estimates. With the existence of cointegration, the short-run elasticity's can also be derived through constructing the error correction of the series in the following:

$$\triangle Ln(RGDPt) = \alpha 0 + \sum_{i=1}^{p} \alpha 1 \mathrm{Ln}(\mathrm{RGDPt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 2 \triangle (\mathrm{ODAt} - \mathrm{i}) + \sum_{1=1}^{p} \alpha 3 \triangle (ODA^2\mathrm{t} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 4 \triangle \mathrm{Ln}(\mathrm{GCFt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 5 \triangle \ln(\mathrm{HCt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 6 \triangle \mathrm{Ln}(\mathrm{EXTt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 7 \triangle \mathrm{Ln}(\mathrm{EXDt} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 8 \triangle \mathrm{INF}(\mathrm{t} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 9 \triangle \mathrm{DUM1}(\mathrm{t} - \mathrm{i}) + \sum_{i=1}^{p} \alpha 10 \triangle \mathrm{DUM2}(\mathrm{t} - \mathrm{i}) + \pi \mathrm{ecmt} - 1 + \mathrm{ut} \quad \text{.....} \quad (3.9)$$

Where α1, α2, α3, α4, α5, α6, α7, α8, α9, α10 are the parameters of the short-run dynamics, π is the speed of adjustment to long-run equilibrium following a shock to the system and Ecmt-1 is the error correction term. The parameter π is expected to be negative and significant to confirm the long-run relationship among the variables.

3.4.3. Granger Causality Test

A granger causality test is made to the selected ARDL model to identify the direction of causality between economic growth and foreign aid. After the cointegration for the long-run relationship among the variables is established through the bound test approach, the long- and short-run causality can be examined separately. Cointegration proposes that there must be a causality of some direction, however, it did not reveal to which direction that causality goes(Menegaki, 2019). Therefore, additional causality analysis is necessary. The long and short-run causality between foreign aid and economic growth was examined by the vector error correction granger causality framework.

Granger causality framework was stated as a matrix form in the following model.

$$(1-\mathrm{L})\begin{bmatrix}\mathrm{LnRGDPt}\\ \mathrm{ODAt}\end{bmatrix} =$$

$$\begin{bmatrix}u1\\ u2\end{bmatrix} + \sum_{i=1}^{p}(1-\mathrm{L})\begin{bmatrix}a11 & a12\\ b21 & b22\end{bmatrix}\begin{bmatrix}\mathrm{LnRGDPt}-i\\ \mathrm{ODAt}-i\end{bmatrix} + \begin{bmatrix}\delta1\\ \delta2\end{bmatrix}\begin{bmatrix}\mathrm{LnRGDPt}-1\\ \mathrm{ODAt}-1\end{bmatrix}(\mathrm{ECMt}-1) +$$

$$\begin{bmatrix}\varepsilon1t\\ \varepsilon2t\end{bmatrix} \qquad (3.10)$$

Where, (1-L) is the difference operator. Significance of the coefficient for lagged error correction term refers to long-run causality and statistical significance of F-statistic using Wald test discussing short-run causality. When the economic growth expressed by real GDP is taken as the dependent variable, the significant and negative coefficient of the lagged error correction term in the above equation (3.10) indicates that foreign aid is granger cause of economic growth in the long run. To determine the short-run causality relation, the Wald test was applied (Mahembe & Odhiambo, 2019; Tekilu & Jamal, 2019). As result, the coefficients related to the lagged values of foreign aid indicator are found significant as a whole, it can be indicated that foreign aid granger causes economic growth in short-run. Likewise, when foreign aid is expressed as the dependent variable, the significant and negative coefficient of lagged error correction term indicates that direction of causality running from economic growth to foreign aid. On another hand, the coefficient of the lagged value of real GDP indicates that economic growth granger cause of foreign aid in short run.

CHAPTER FOUR

RESULT AND DISCUSSIONS

4.1. Descriptive Analysis

4.1.1. An Overview of Ethiopian Economy

The Ethiopian economic growth has shown various changes in different political regimes. The changes in government structure created a problem of inconsistency in implementing the policies by previous regimes including external and internal wars as well as a natural disaster like famine and drought had a depressing effect on the history of the economic growth of the country(Tefera, 2017).

A. The Socialist (Derg) Regime From 1982 to 1999

The revolution in 1974 ultimately resulted in the removal of the emperor from power. Immediately after Emperor Haile Selassie was overthrown; a Military Committee was established from several divisions of the Ethiopian armed forces. As result, the government installed a socialist (command) economic system where the market system was deliberately repressed and socialization of the production and distribution process followed. The land reform policy of Derg was the major success history that earned credit to the socialist government and that was honored by the masses. The Derg did not give any opening for privatization to domestic and foreign investors(Tewodros, 2015).

In l975, the government nationalized or took partial control of most companies including extra housing, financial firms, manufacturing, and so on. Furthermore, the regime nationalized rural land and granted peasants not to exceed ten hectares per grantee and issued Proclamation No. 76, which established a 500,000 birr ceiling on private investment and advised Ethiopians to invest in enterprises larger than cottage industries during this period(Tasew,2011;Alemayehu & Befekadu,2005). Though, this policy transformed in mid-1989, when the government implemented three declarations: Inspire the development of small-scale industries, the participation of non-governmental bodies in the hotel industry, and the establishment of joint ventures.

Under the Provisional Military Administrative Council, Ethiopia's political system and economic structure changed radically. The average rate of growth of gross domestic product (GDP) and the per capita term was 1.6% and -0.7%, respectively according to Eshetu and Mekonnen(1992) as cited in (Tewodros, 2015)during 1974-1990 and this growth rate was far below the estimated population growth of 2.5%. However, in 1984 and 1985, the GDP growth rate began to decelerate, amounting to -5.3%, which means that the per capita GDP was -10% in the same period. Similarly, Alemayehu &Befekadu (2005) reported that economic growth was decelerated to 2.3 percent *(-0.4* percent in per capita terms*)* between 1974/75 and 1989/90. This shows that the average annual growths of GDP and GDP per capita were 2% and 0.5%, respectively during the entire period of Derg (1974-1991). The sectoral growth rate of agriculture, industry and service sector were 1.3, 1.4 and 3 percent, respectively during the same period.

B. The Post -1991 EPRDF

The post-1991 period begun, with the coming to power of the Ethiopian People Revolutionary Democratic Front (EPRDF), and the government removed the Derg regime that had ruled the country for seventeen years. In contrast to the previous policy regime of hard and command control, EPRDF initiated a wide range of reforms that covered the exchange rate, interest rates, liberalization of trade, domestic production, and distribution, devaluation of the currency, eliminating structural distortion, improving the country's human capital and infrastructure as well as poverty reduction(Asaye, 2017).

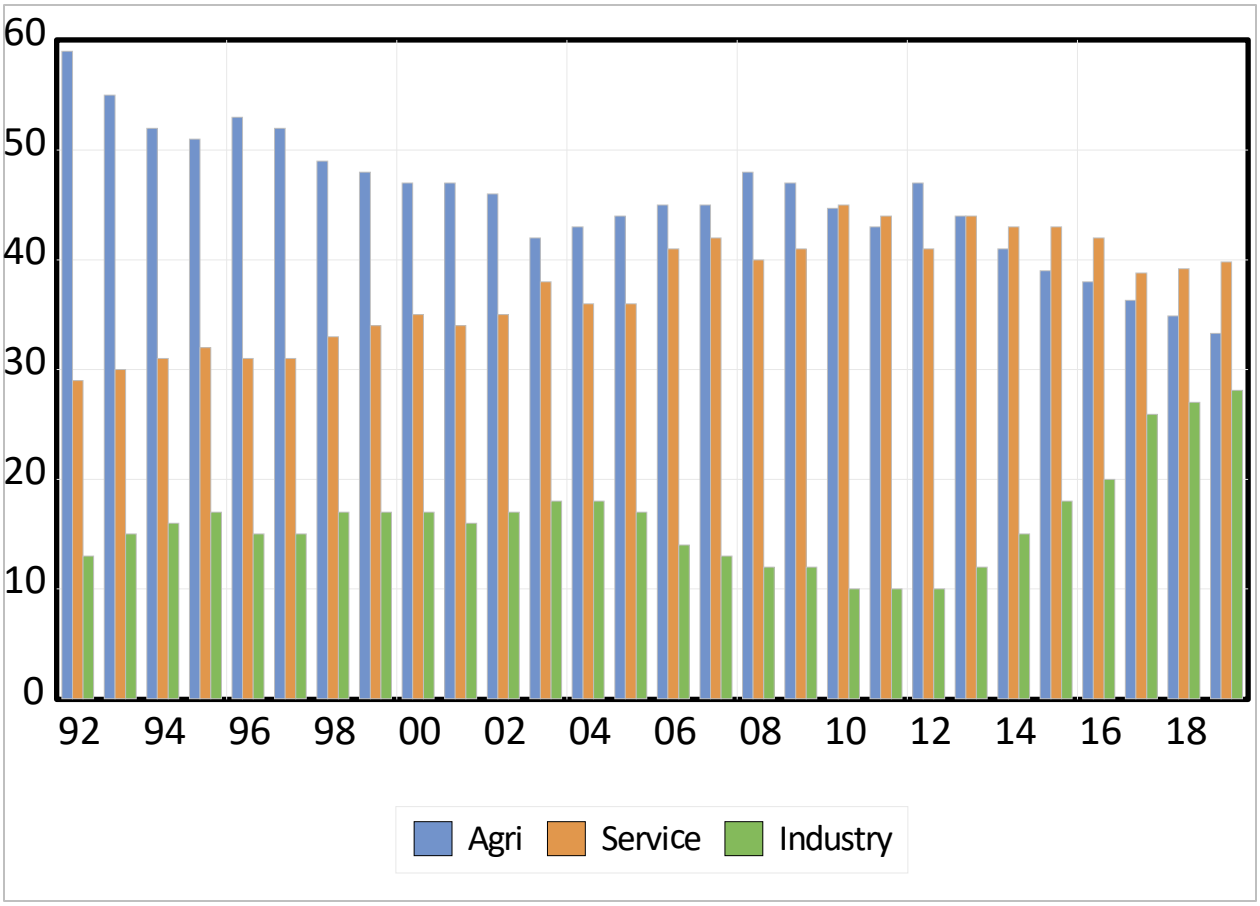
C. Macro-Economic Performance of Ethiopia

Ethiopia has a vision of becoming a middle-income country in the coming one and half decades after implementing three successive five years transformation and development plans. The development policies and strategies pursued Sustainable Development and Poverty Reduction Program (SDPRP), the country's vision and achievements registered under SDPRP were the basis for PASDEP. The macroeconomic policy index developed from fiscal (a budget deficit), monetary (inflation), and trade (Openness) policy. These macroeconomic policy environments determine the growth rate of the economy in general and the effectiveness of foreign aid in particular. A good macroeconomic policy creates a stable economic environment and initiates investors to invest and generate a profit(Wendimu, 2018).

4.1.2. Trend of Ethiopian Real GDP From 1981-2020

Even though the history of the growth performance was poor in the past; the country has experienced strong economic growth in the current time (especially, since 2003/04). For instance, Real GDP growth averaged 11.2% per annum during the 2003/04 and 2008/09 periods, placing Ethiopia among the top-performing economies in Sub-Sahara Africa. This growth performance is well more than the population growth rate and the 7 percent rate required for attaining the MDG goal of halving poverty by 2015(African Development Bank, 2010). The source of this overall economic growth is mainly attributed to the growth in the agriculture and service sectors(National Bank of Ethiopia, 2016).

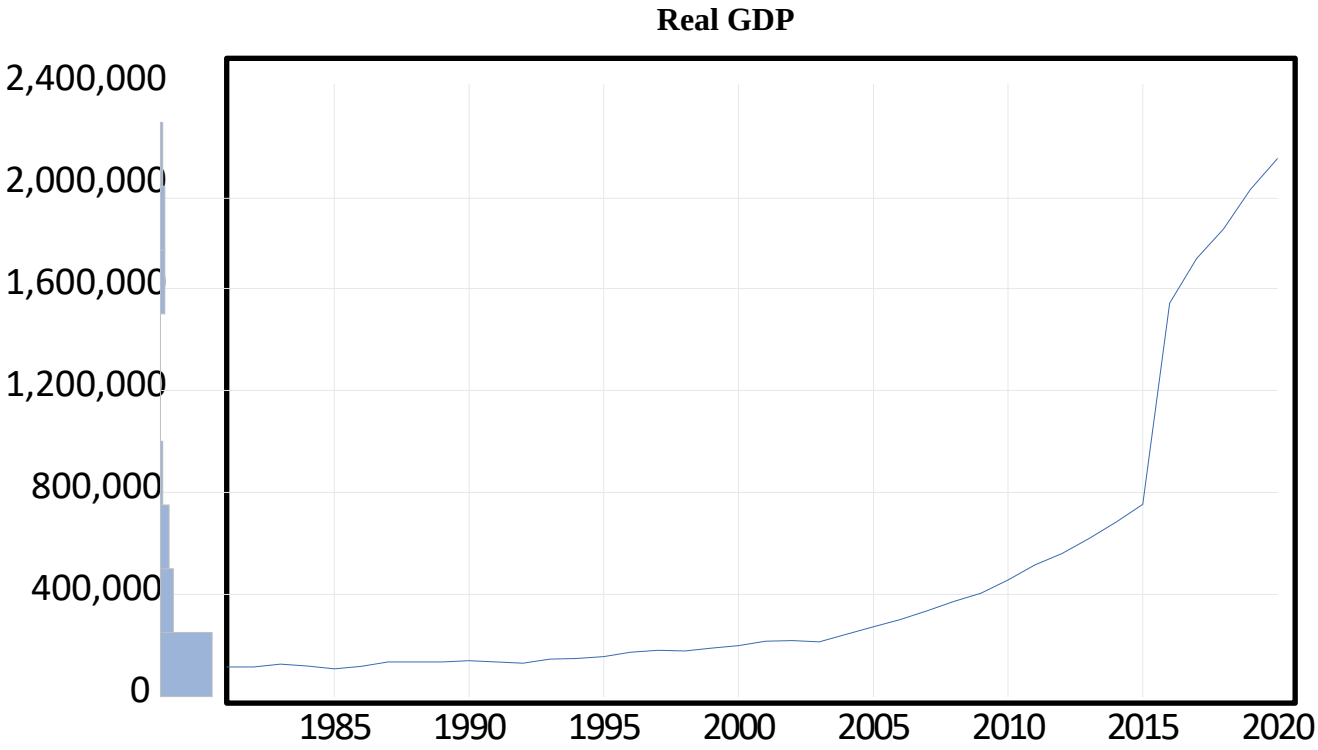
Real GDP grew by 10.9% in 2016/17, up from the 8.0% growth registered in 2015/16. The industrial and services sectors contributed significantly to GDP growth by expanding at a rapid rate of 18.7% and 10.3% respectively. Construction, manufacturing, and electricity sub-sectors were the most important contributors to faster growth of the industrial sector and grew respectively by 20.7%, 17.4%, and 11.4% in 2016/17 (compared to 25%, 18.4%, and 15% in 2015/16). Construction benefited from public infrastructure investment, notably in transport, energy, water, and sanitation. Investments in industrial parks contributed to steady growth in manufacturing. Strong growth in Foreign Direct Investment (FDI), particularly in infrastructure and manufacturing, also increased industrial sector value-added. The services sector, the leading contributor to real GDP, grew at 10.3% in 2016/17 compared to 8.6% the previous year. Trade, transport and communications, public administration, and real estate led growth in the services sector, which accounted for the largest share of GDP. Financial intermediation, hotels, and restaurants also supported growth in the services sector, although their contribution was largely unchanged in 2015/16 and 2016/17(Sennoga, 2018).



Source: Own computation from NBE

Figure 4.1: Sectorial Share of GDP in Ethiopia from 1992-2020

The Ethiopian economy which had exhibited 9.1 percent average annual growth during 2014/15-2018/19, registered 9 percent expansion in 2018/19, showing improvement relative to the 7.7 percent growth of last year although it was 2 percentage point lower than the base case scenario of GTP II target set for the year. It was also significantly higher than the 3.1 percent average growth estimated for Sub-Saharan Africa. The growth in real GDP was mainly attributed to 11 percent growth in services, 3.8 percent in agriculture, and 12.6 percent in industrial sectors. Nominal GDP per capita rose to USD 985, depicting an 11.6 percent improvement over the previous year(National Bank of Ethiopia, 2019).



Source: Computed based on MoFED & NBE data

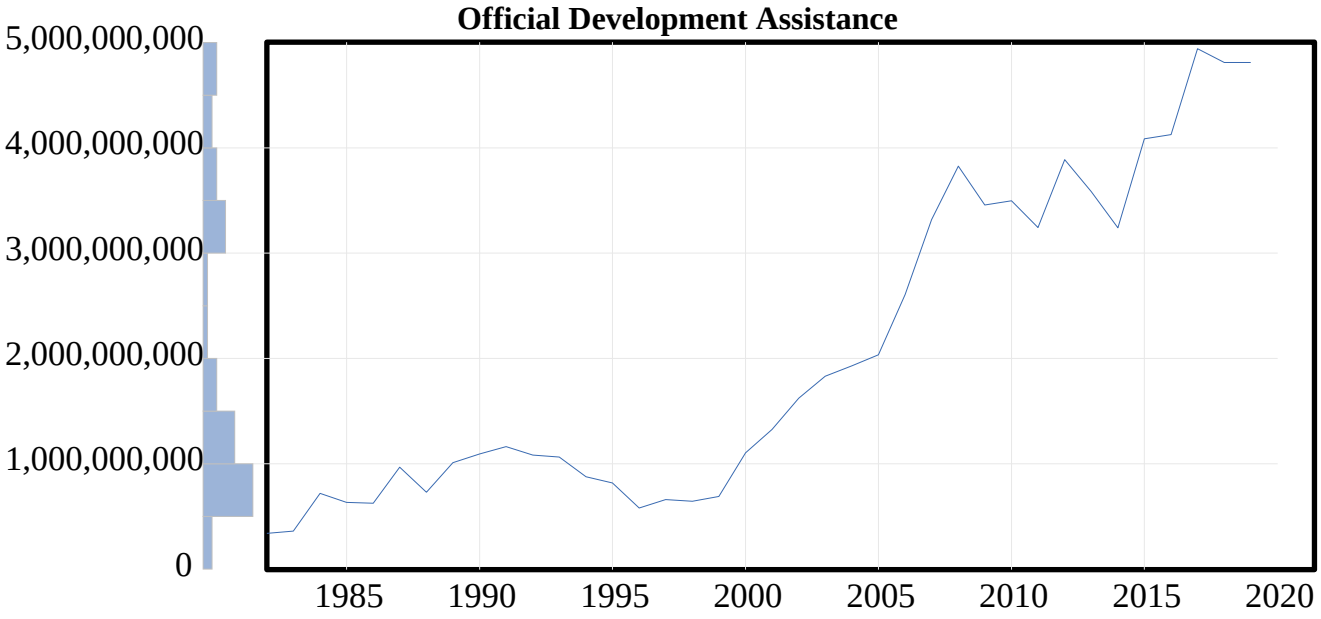
Figure 4. 2 Trends of Total Real GDP in millions of birr from 1981-2020

According to MoFED & NBE data, the real GDP of Ethiopia was 115,224.1124 million birrs in 1980/81 and it reaches 2,109,122.2 million birrs in 2019/2020. However, the annual growth rate of real GDP between the two periods was experiencing both negative and positive growths. In the current regime, the figure of real GDP is higher than that of the Derge regime. As shown from the above figure the total real outputs is a constant increment from the beginning up to the year 2000 and relatively increase at an increasing rate from 2005 onwards and maximum in 2020.

4.1.3. Trend of Foreign Aid From 1981 to 2020

Ethiopia has received a tremendous amount of foreign aid over the past few decades. The increase in development aid to Ethiopia in the 1990s following the rise of Prime Minister Meles Zenawi corresponded with an expanding vision of Ethiopia as the leader of an "African Renaissance"(Flores, 2013). Foreign aid has been increasing from time to time, for instance, according to OECD/DAC data, Ethiopia has received a total of USD 4,211.43 million in Official

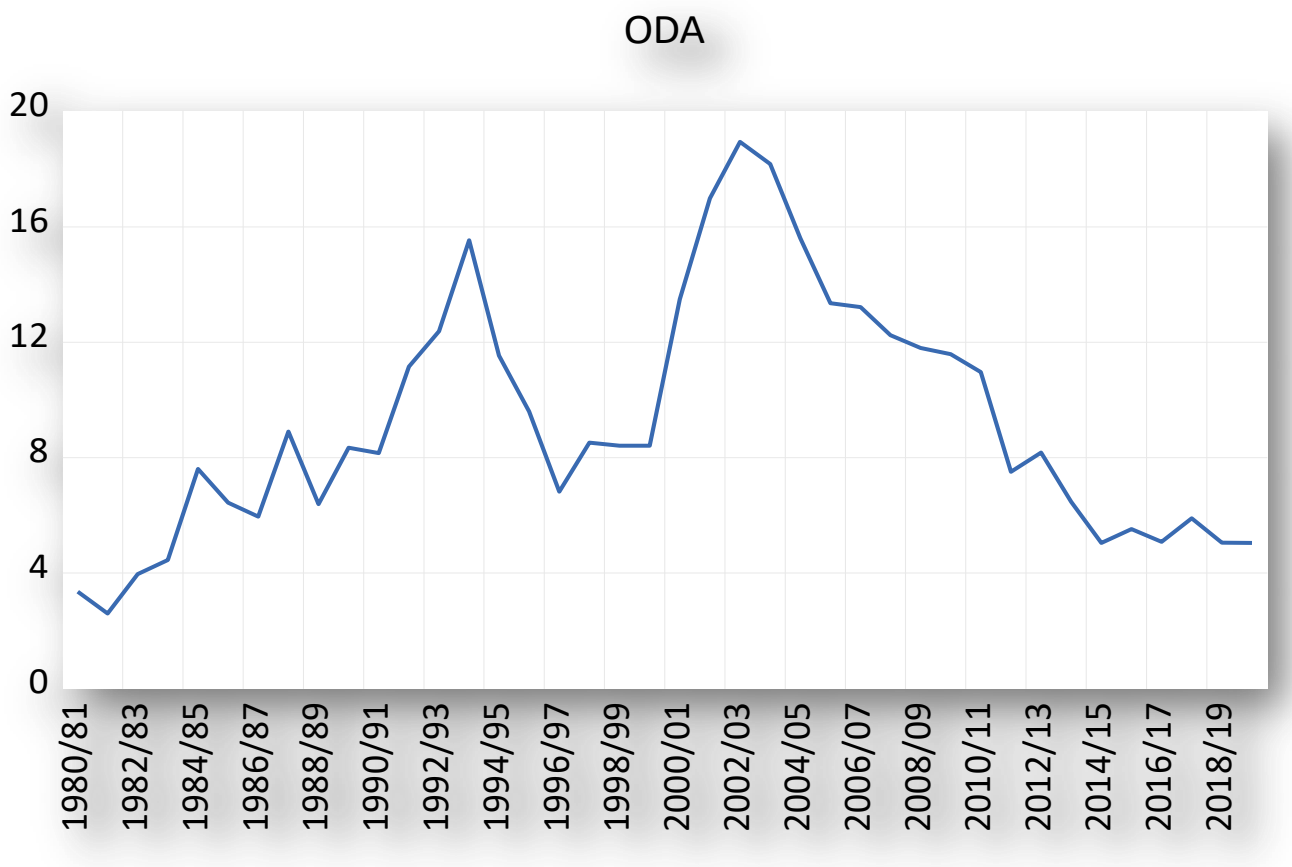
Development Assistance (ODA) from development partners in 2016. Of the $2.8 billion in total foreign aid committed to Ethiopia in 2019, commitments by the US, the World Bank Group, and the UK comprised $1.5 billion. The combined aid from these three donors consistently provides close to half of the total international assistance to Ethiopia. On average, Ethiopia has received $3.5 billion from international donors in recent years, which represents between 50 to 60 percent of its national budget(Development Assistance Group, 2018).



Source: Computed based on WB/ OECD data

Figure 4. 3: Trends of total official development assistance received in millions of birr from 1981-2020.

According to WB/OECD data, Ethiopia was received 199,330,002 in millions of birr Official development assistance (ODA) in 1980/1981 and reaches 4,809,970,215 in million birr in 2019/2020. In addition from the above figure (4.3) shows that total official development assistance Ethiopia received was some up and down fluctuation from the beginning to up 2016 and reached maximum in 2018, then decline up to 2020.



Source: Computed based on WB data

Figure 4. 4: Trends of official development assistance received as % of GDP from 1981-2020.

According to WB data, ODA as % GDP of Ethiopia was 3.35 in 1980/1981 and reaches 5.04 in 2019/2020. As shown from the above figure ODA as % of GDP was some the up and down fluctuation starting from the beginning to 2000 and became a maximum point in 2002/03, then continue to decline up to 2020. Ethiopia's economy is has been plagued by a history of drought and famine, including major famines from 1973-74, 1983-85, and most recently, the drought of 2015-2016, one of the worst in decades(Zachary et al, 2017). According to Ali(2017), Ethiopia is vulnerable to drought, with greater than a 40% annual probability of moderate to severe drought during the rainy season, and according to Fentaye(2015) Despite the huge flow many claims that aid to Ethiopia is ineffective in bringing about the desired changes, for instance, in terms of poverty reduction and enhancing economic progress. But this does not imply that aid is wasted (or, aid is ineffective at all) because there are some improvements in the social indicators like enhancing access to education and health services. As a result, foreign aid was served for the

consumption of the society rather than financing economic developments. Therefore, based on the above figure, Aid ratio to real GDP 18.94 percent in 2002/03 (i.e. the highest value under the study period), and continued to decrease from the maximum point in 2002/03 to 5.04% in 2019/20.

4.2. The Unit Root Test Analysis

To determine the degree of integration, a unit root test is carried out using the standard Augmented Dickey-Fuller (ADF). Moreover, in applying the ARDL model all the variables entered in the regression should not be integrated of order two. To check these conditions, a unit root test is conducted before any sort of action is taken. Even though the ARDL framework does not require pre-testing variables to be done, the unit root test could convenient whether or not the ARDL model should be used. The result in the table (4.1) shows that there is a mixture of I (0) and I (1), but not any order two.

Table 4. 1 Augmented Dickey-Fuller Unit Root Test

Variables(At level and 1st difference)	**t-statistics(P-value)(with intercept but no trend)**	**t-statistics (P-value) (with intercept and trend)**
LnRGDP	2.344392[0.9999]	-0.674235[0.9681]
△LnRGDP	-5.203327[0.0001]***	-6.162093[0.0000]***
LnGCF	2.037661[0.9998]	-1.277752[0.8788]
△LnGCF	7.474924[0.0000]***	-8.412665[0.0000]***
ODA	-1.711504[0.4177]	-1.480182[0.8195]
△ODA	-5.378049[0.0001]***	-5.643320[0.0002]***
LnHC	-0.927734[0.7684]	-3.464549[0.0576]*
△LnHC	-3.928459[0.0046]***	-3.734052[0.0326]**
ODA^2	-2.453674[0.1344]	-2.339006[0.4042]
$\triangle ODA^2$	-7.649135[0.0000]***	-7.709205[0.0000]***
LnEXD	-1.147026[0.6872]	-3.202918[0.0987]*
△LnEXD	-7.060997[0.0000]***	-6.989882[0.0000]***
LnEXT	0.720442[0.9911]	-2.26144[0.2735]

△LnEXT	-5.801787[0.0000]***	-5.981865[0.0001]***
INF	-5.586320[0.0000]***	-5.974465[0.0001]***
△INF	-6.253694[0.0000]***	6.155623[0.0001]***
DUM1	-4.012272(0.0036)***	-4.655068(0.0034)***
△DUM1	-6.996523(0.0000)***	6.926322(0.0000)***
DUM2	-3.379669(0.0179)**	-3.319005(0.0781)*
△DUM2	-6.0000(0.0000)***	-5.929938(0.0001)***

Source: Own Computation by using Eviews11

Note**:** The ***, **,** and * sign indicate the significance of the coefficients at 1, 5, and 10 percent, significant level respectively.

The unit root test result confirms that real GDP is non-stationary at a level with intercept [i.e. I (0)] and with intercept and trend [i.e. I (0)]. While at the first difference between intercept and with intercept and trend it is stationary [i.e. I (1)]. The unit root test results in a table (4.1), also confirm that explanatory variables are non-stationary [i.e. I (0)] at levels except general inflation rate, dummy for drought and dummy for political instability are stationary at levels and others are stationary [i.e. I (1)] at their first differences. Meaning that variables included in this model are integrated of order zeros [i.e. I (0)] and order one [i.e. I (1)], but not any order two [i.e. I (2)] which is not desirable to apply the ARDL model.

4.3. Diagnostic Test and Model Stability

To check the verification of the estimated model, diagnostic testing is important before undertaking any econometric data analysis. Some of the diagnostic tests such as the Heteroscedasticity test, Serial correlation test (Brush & Godfray LM test), Normality (Jaque-Bera test), and Functional form (Ramsey's RESET) test were undertaken to proceed with the analysis of the model result. Therefore, diagnostic tests are representing that long-run and short-run estimates are free from serial correlation, misspecification problem, non-normality of the error term, and heteroscedasticity as indicated in the below table (4.2). Moreover, the stability of long-run estimates has been tested by the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) test recommended by(Peasaran et al., 2001). To reject or accept the null hypothesis, we can decide by looking at the p-values associated with the test statistics. That is the null hypothesis is rejected when the p-value is smaller than the standard significance level (I.e. 5%).

Table 4. 2: Diagnostic test for the long run ARDL

Test Statistics	Null hypothesis	F-Stat DF	Observed R-squared(Chi-square prob)	F-Statics prob.	Decision
Serial correlation	No correlation among residuals	F(2, 12)	0.0944	0.4512	Fail to reject
Normality	Residual is normality distributed	-	0.703420	Not applicable	Fail to reject
Heteroskedasticity	Residual is homoscedastic	F(23,14)	0.7059	0.8630	Fail to reject
Ramsey's RESET test	No miss specification	F(1,13)	Not applicable	0.0526	Fail to reject

Source: Author's computation by using Eviews11 (See Appendix C)

The above table (4.2) indicates that the long-run ARDL model estimated in this study passes all the diagnostic tests. This is because the p-value associated with both the Chi-square and the F version of the statistic was unable to reject the null hypothesis specified for each test. The null hypothesis of no serial correlation (Brush Godfray LM test) is failed to reject for the reason that that the p-values associated with the test statistic are greater than the standard significant level (I.e. 0.0944> 0.05). The second diagnostic test is the residual normality test. As the result indicates that we could not reject the null hypothesis which says that the residuals are normally distributed, for the reason, that the p-value associated with the Jaque-Berra normality test is larger than the standard significance level (I.e. 0.703420>0.05). The third diagnostic test is for the heteroscedasticity test. As we have seen from the above table(4.2), we cannot reject at a 5% significant level due to its p-value associated with the test statistics are greater than the standard significance level**(** I.e. 0.7059> 0.05). We could not reject the null hypothesis test for Ramsey's RESET test, which tests whether the model suffers from omitted variable bias or not. As the test result indicates that we can't reject Ramsey's test, by probability F-test which is greater than five percent. Furthermore, the cumulative sum of recursive residuals (CUSUM) and the cumulative

sum of squares of recursive residuals (CUSUMSQ) tests was used to detect the stability of the model for the long run and short-run relationship. The test finds serious parameter instability if the cumulative sum goes outside the area (never returns) between the two critical lines.

The plot of Cumulative Sum of Recursive residuals (A)

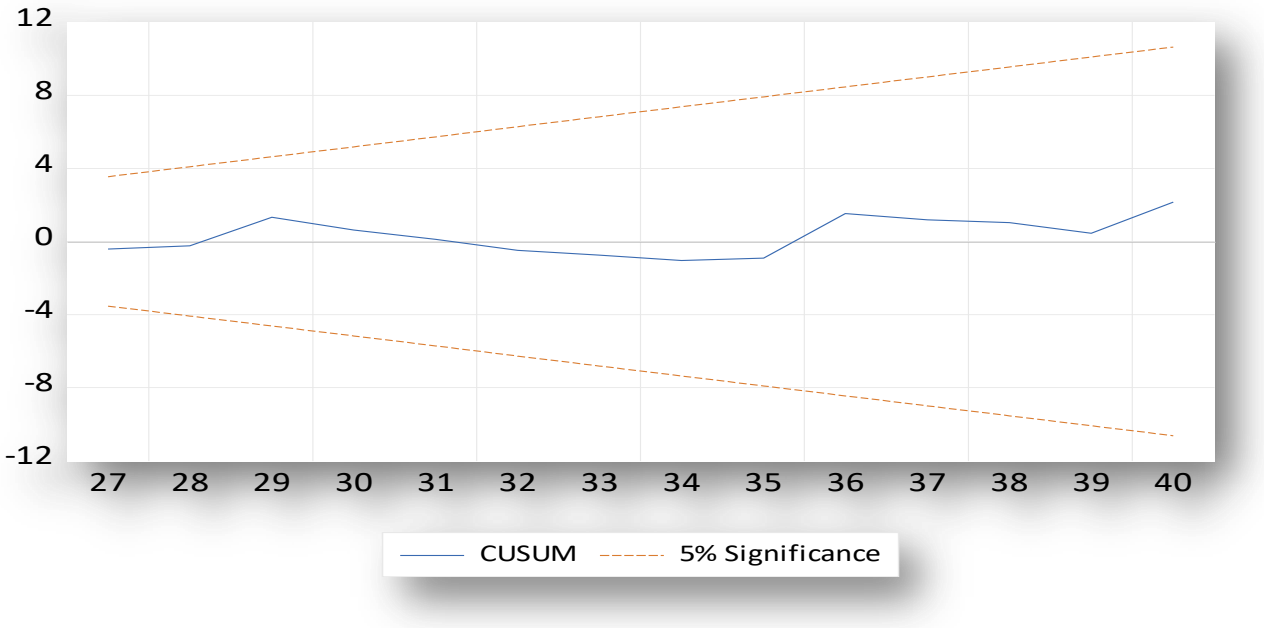
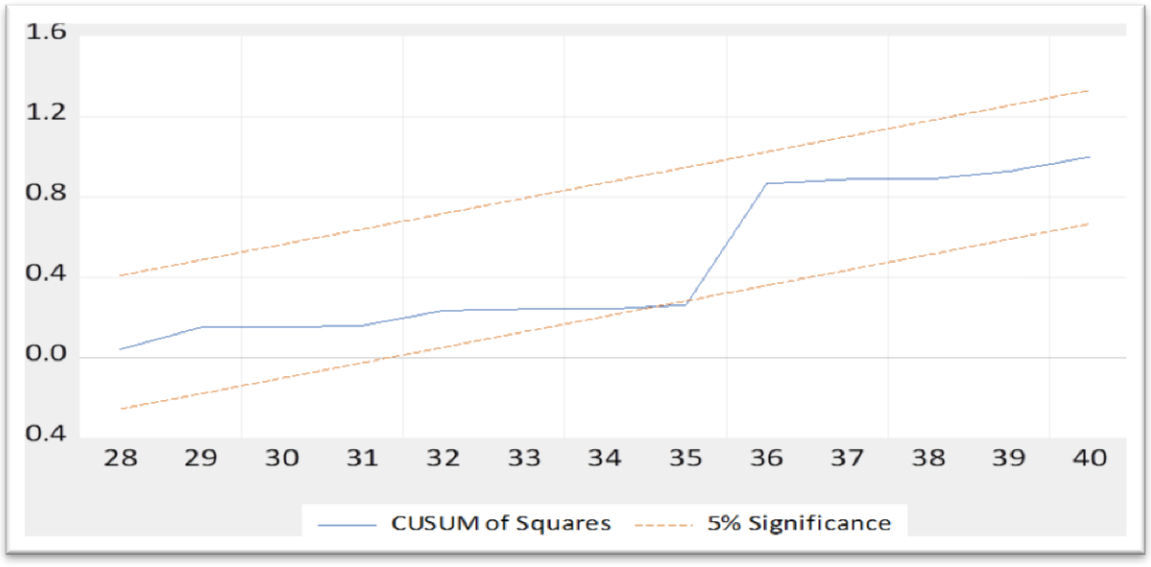


Figure 4.5: Plot of Cumulative Sum of Recursive residuals

The plot of Cumulative Sum of Squares of Recursive residual (B)



Source: Eviews11 result

Figure 4. 6: Plot of Cumulative Sum of Squares of Recursive residuals

The results of both CUSUM and CUSUMSQ test figures (4.5) and (4.6) showed that; the plot of the CUSUM recursive residual test statistic did not cross the critical limits. Similarly, the CUSUMSQ recursive residual test statistic shows that the graphs do not cross the lower and upper critical limits, instead moves between the critical bounds. This indicates that there is no structural instability in the model during the period under investigation. Therefore, we can conclude that long-run estimates are stable and there is no structural break.

4.4. Long Run ARDL Bounds Tests for Co-integration

ARDL bounds analysis is used to investigate the presence of long-run relationships among the variables included in the model. To undertake a cointegration test with help of the ARDL bound test, the maximum lag length must be determined, and choosing a maximum of 2 lags for the annual data series was recommended by (Pesaran & Shin,1999) & (Narayan, 2004). This is because an important issue addressed in employing ARDL is selecting the optimum lag length. The model was estimated by ARDL, and the researcher set recommended the maximum lag length at 2 years for which is sufficiently long enough for annual data series to investigate the variable relationship and then AIC is employed to choose the best ARDL model. The computed F statistic value is compared with the lower and upper bound critical values provided by Peasaran & Shin(1999) and Narayan(2004) and it should exceed the cross-validation (CV) to establish the long-run relationship of the series. As it is depicted below in table (4.3), with an intercept, the calculated F statistics is 5.75.

Table 4. 3: Bound Test for Co-integration Analysis

Description	Values	K-9 Critical value	Upper bound values	Lower bound values
Calculated F-statistic	5.751277	1%	3.97	2.65
Optimal lag length of the model	2	2.5%	3.6	2.37
Number of observations	40	5%	3.3	2.14
		10%	2.99	1.88

Source: Own computation by using Eviews11(See Appendix E)

According to the result shown in table (4.3), we have the upper and lower Narayan(2004) critical values to compare with corresponding F statistics to reject or accept the null hypothesis of no long-run relationship among the variables. As discussed earlier, for a small sample ranging

from 30 to 80 years' data, the researcher has been used Narayan's (2004) critical values in which Eviews software provided automatically. As the result observed from table (4.3) shows that F-statistic is 5.75 which is greater than the upper bounds critical value at a 1% significance level. This showed that there is a strong evidenced long-run relationship between economic growth and explanatory variables. Therefore, the null hypothesis of no long-run relationship is rejected at a 1% significance level and the alternative hypothesis of the existence of a long-run relationship between the variables is accepted.

4.4.1. Long Run ARDL Model Estimation

Once cointegration among economic growth and all explanatory variables through bound test is confirmed, then the long-run estimation of the model comes next. The estimated coefficients are stated in the table (4.4), in doing so; the Akaike information criterion (AIC) is chosen with two maximum lag orders and found the ARDL (1, 2, 0, 1, 2, 1, 2, 2, 1, 2). The F-statistic indicates that the model is statistically significant as a whole and the R-squared value of the estimated model reveals that 99.8 percent of the variation in real GDP is substantially explained by the variables included in the model(see Appendix B). Because the Durbin Watson statistic value is two and greater than the upper critical value of the DW-test, there is no spurious relationship between the variables (there is no serial autocorrelation).

Table 4.4 Estimated Long Run Coefficients using the ARDL Approach

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ODA	-0.056617	0.019460	-2.909340	0.0114
ODA2	0.000789	0.000650	1.214293	0.2447
LNGCF	0.592201	0.104901	5.645323	0.0001
LNHC	0.146124	0.048021	3.042954	0.0088
LNEXT	-0.232131	0.099780	-2.326432	0.0355
LNEXD	0.140747	0.042033	3.348486	0.0048
INF	0.009450	0.002226	4.245681	0.0008
DUM1	0.075831	0.089671	0.845660	0.4120
DUM2	-0.348567	0.153606	-2.269235	0.0396

EC = LNRGDP - (-0.0566*ODA + 0.0008*ODA2 + 0.5922*LNGCF + 0.1461 *LNHC -0.2321*LNEXT + 0.1407*LNEXD + 0.0094*INF + 0.0758*DUM1 -0.3486*DUM2)

Source: Author's Calculation by Using Eviews11(See Appendix F)

In long run, the estimated coefficients of foreign aid, gross capital formation, human capital, external debt, total export, Inflation rate, and drought dummy are statistically significant. While the squared foreign aid and political instability dummy are not statistically significant.

As the results depict that foreign aid as a major variable of this study has an unexpected negative relationship with economic growth. The coefficient interpreted as, a one percent increase in foreign aid, holding other things constant, has resulted in an approximately a 0.057 percent decrease in real GDP during the study period. However, this finding is not consistent with the two-gap theory that suggests foreign aid promotes economic growth by supplementing limited domestic savings as well as foreign exchange constraints of recipient developing countries(Chenery and Strout,1966). Furthermore, this finding is in agreement with those of(Haile,2015; Solomon,2016;Tefera,2017;Gadisa et al, 2018; Belay & Girma,2018) in Ethiopia. Conversely, the result is disagreement with (Yohannes,2011; Mohammed,2012; Tesfahun,2014; Fentaye,2015; Wendimu, 2018) in Ethiopia. The negative impact of foreign aid might be that the inflow of foreign aid received in the form of grants and loan spent to use for daily expense on the consumption of goods and services and help the society in reducing poverty rather than building a fixed investment, which is used to accelerating economic growth. If so, it does not have any impact on Ethiopian economic growth due to no value add to macroeconomic growth.

Unlike the theoretical expectation the squared foreign aid term that was used to detect the presence of capacity constraint, has a significant effect on economic growth. The result suggests that the squared foreign aid coefficient is an insignificant positive sign. Therefore, this finding did not show whether foreign aid tends to have diminishing returns or not in the Ethiopian situation in the study period considered. However, the finding may call for further research to be investigated since countries with low levels of human capital and poor institutions are expected to have a capacity constraint in absorbing excessive capital from abroad. The long-run estimated coefficient of gross capital formation is an expected positive statistically significant at a one percent significant level. The coefficient interpreted as, a one percent increase in gross capital formation by holding other things constant, has led to a 0.592 percent increase in real GDP during the study period. The positive coefficients of the estimated long-run result of gross capital formation are; in-line with the theory of economic growth; which states that capital formation is

the major determinant of economic growth (Keynesian theory of growth, Solow's theory of growth)(Koutun & Karabona, 2013). Moreover, this result is in agreement with(Tasew,2011; Sileshi, 2012; Tewodros, 2015; Tefera, 2017; Amsalu, 2017 ; Wendimu, 2018; Kebede, 2019, & Urgessa, 2020)in Ethiopia.

The long-run coefficient of human capital formation/expenditures for education and health revealed that, as expected long-run positive impact on the economic growth with statistically significant at a one percent significant level. As a result, a one percent increase in human capital formation which is proxied by expenditures to education and health in the long run, holding other things constant, has resulted in a 0.146 percent change in real GDP during the study period. It is consistent with the endogenous growth theories which argue that improvement in human capital (skilled and healthy workers) leads to productivity improvement that enhances output(Todaro & Smith, 2012; Mankiw, 2013; Jones, 2019). Furthermore, this result is similar to the results found by (Tadesse ,2011; Tofik ,2012;Fentaye,2015; Haile ,2015; Tefera ,2017; Tekilu & Jamal, 2019, & Hayu et al, 2021) in Ethiopia.

The result of this study revealed that total exports of goods and services have a significant negative impact on economic growth. The coefficient interpreted as, a one percent increase in total export, by holding other things constant has resulted in a 0.232 percent decrease in real GDP in the long run. This result is in agreement with Tesfahun (2014), Belay & Girma(2018), and Gebeyehu (2019). However, the result is in disagreement with Woubet(2006) and Senait(2014) in Ethiopia. This negative coefficient might be associated with more export in the country comes from agricultural primary products, if so the markets for agricultural products are largely unstable in terms of volume, price and carry a high degree of risk and uncertainty. Thus such features are not helpful to the contribution of agricultural exports to the economic growth of the country.

External debt has an unexpected significant positive relationship with real GDP. The coefficient interpreted as a one percent increase in external debt in long run, by keeping other things constant, has resulted in approximately a 0.141 percent increase in real GDP. This finding is consistent with (Maruta, 2013; Mohanty,2017; Amsalu,2017, & Jimmy, 2020). However, it is

not consistent with the findings of (Tewodros,2015; Garedew,2016; Ramakrishna,2016, and Asaye,2017) in Ethiopia. For the positive relationship between external debt and real GDP, it can be justified that due to higher financial inflow in terms of foreign currency, more funds would be available to be invested in the economy which facilitates the economic growth of the country. This result also indicates that the absence of debt overhang problem in the country. The estimated coefficient of the general inflation rate has an unexpected significant positive impact on economic growth. The coefficient interpreted as a one percent increase in inflation rate by keeping other things remains constant has resulted in approximately a 0.01 percent increase in real GDP. This result is consistent with (Makuria,2013;Amsalu, 2017;Asaye,2017; Gashe, 2017; Emako,2018; Tadesse, 2019) in Ethiopia. The positive impact of inflation may due to lower inflation or normal inflation will initiate the economy to boost. The result from the above table (4.4) shows that dummy for drought as expected negative impact on the economic growth of Ethiopia at five percent significance level. This result has an agreement with Kidanemariam(2014) in Ethiopia.

4.4.2. Short Run Error Correction ARDL Model Results

The short-run error correction estimation is a one-legged period residual obtained from the estimated dynamic long-run model. The coefficient of the error correction term (ECM) indicates how quickly variables converge to equilibrium. Furthermore, it should have a negative sign and statistically significant at a standard significant level. The coefficient of determination (R-squared) explains that about 92.8% of the variation in GDP is attributed to variations in the explanatory variables in the short-run model(See Appendix G). In addition, the DW statistic does not suggest autocorrelation and the F-statistic is quite robust. The short-run coefficient of the model explains the short-run relationships between economic growth and explanatory variables are depicted as follows:

Table 4. 5: Error Correction Regression for ARDL Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.060264	0.413064	9.829622	0.0000
D(ODA)	-0.030737	0.004914	-6.254873	0.0000
D(ODA(-1))	-0.019154	0.004698	-4.076808	0.0011
D(LNGCF)	0.247037	0.045262	5.457931	0.0001
D(LNHC)	0.010749	0.012039	0.892882	0.3870
D(LNHC(-1))	-0.053659	0.021031	-2.551388	0.0231
D(LNEXT)	0.106856	0.055808	1.914730	0.0762
D(LNEXD)	-0.030055	0.011009	-2.730088	0.0163
D(LNEXD(-1))	-0.030443	0.013535	-2.249220	0.0411
D(INF)	0.001524	0.000556	2.742355	0.0159
D(INF(-1))	-0.002403	0.000685	-3.506414	0.0035
D(DUM1)	-0.030543	0.031192	-0.979174	0.3441
D(DUM2)	-0.098647	0.025153	-3.921836	0.0015
D(DUM2(-1))	0.072912	0.027347	2.666205	0.0184
CointEq(-1)*	-0.636694	0.065501	-9.720353	0.0000

Source: Author's Calculation by Using Eviews11(See Appendix G)

Note: CointEq(-1) indicates the coefficient of error correction term(ECM-1) suggests that the deviation from the long-run equilibrium level of real GDP.

An ECM coefficient in the short run was negative and statistically significant at a 1% level with a value of -0.637. This implies that 63.7 percent of the disequilibrium in the short-run was corrected in the current year which means the short-run distortion is to be corrected towards the long-run equilibrium path. The error correction coefficient estimated at -0.637 is significant and has a better speed of adjustment to equilibrium. According to Bannerjee et al. (2003), as cited by(Kidanemariam, 2014; Belay & Girma, 2018), the highly significant error correction term further confirms the existence of a stable long-run relationship. Moreover, the coefficient of the error term (ECM-1) suggests that the deviation from the long-run equilibrium level of real GDP in the current period is corrected by 63.7% in the next period to bring back equilibrium when there is a shock to a steady-state relationship and the long-run effect of the model can be captured by the error term (ECM).

In the short run, the estimated coefficient of foreign aid, gross capital formation, total export, external debt, inflation, and drought dummy are statistically significant. While human capital and political instability dummy are not significant. The significant impact of foreign aid is similar to in the long run which has a significant negative impact on economic growth with an unexpected

coefficient sign. As a result, holding other things constant a one percent increase in foreign aid leads to an approximately 0.031 percent decrease in real GDP in the short run. This result is consistent with Kitessa (2012), and Solomon(2016) in Ethiopia. The estimated coefficient of gross capital formation has a significant positive impact on economic growth with expected coefficient signs in both the long run and the short run at a one percent significance level. This result is similar to Kidanemariam(2014) in Ethiopia. This shows that, holding other things remain constant a one percent increase in gross capital formation will result approximately in 0.247 percent increases in real GDP in the short run during the study period.

Export of goods and services has as expected positive significant impact with economic growth in short-run but unlike with the long- run which has a significant negative impact. The coefficient interpreted as, a one percent increase in export of goods and services by keeping other things remain constant, has resulted in to increase in Real GDP approximately by 0.11 percent in the short run. The result revealed that the estimated external debt has an expected negative relationship with real GDP and statistically significant at a five percent significance level. As a result, holding other things constant, a one percent increase in external debt will result in an approximately 0.03 percent decrease in the real GDP in the short run. This result is in agreement with Asaye (2017), and Tewodros(2015) in Ethiopia.

The general inflation rate has an unexpected positive impact on economic growth in both the short-run and long-run at a 5% and 1% significance level respectively. The coefficient is interpreted as a one percent increase in the inflation rate, holding other things constant will lead to an increase in real GDP by 0.002 percent in the short run. The short-run estimated coefficient of dummy for political instability an expected negative sign, but it is not statistically significant. The coefficient for the dummy variable on drought (DUM2) as expected negative impact on economic growth in both short-run and long-run. Therefore, from the above table (4.4) and (4.5) results, one can understand that drought has a significant negative impact on Ethiopian economic growth in both the short-run and long-run during the study period under consideration.

4.5. Granger Causality Results

This study has employed the Granger causality test to determine the direction of causality between cointegrated variables applying the vector error correction version of granger causality

tests which would enable us to track the long-run and short-run causality among interested variables. The precondition for testing Granger causality in the long run based on vector error correction depends on whether two variables are cointegrated or not(Granger ,1969). The long-run causality can be inferred from the significance of the lagged error correction terms, while the short-run association is inferred from the coefficient of the lagged differenced variables. Therefore, the requirement for long-run causality is that *ECT* coefficients must be negative and statistically significant, and the short-run causality has been tested using the Wald test.

Table 4. 6: Results of Vector Error Correction Model and Wald test

	Null Hypothesis	Obs.	Lags	Coefficient	Prob.
Long-run	ODA does not Granger Causes Ln (RGDP)	37	NA	0.050363	0.0498
	Ln (RGDP) does not Granger Causes ODA	37	NA	-1.026550	0.0177**
Short-run	ODA does not Granger causes Ln(RGDP)	37	2	-0.009426	0.3511
	Ln (RGDP) does not Granger Causes ODA	37	2	3.310900	0.2732

Source: Author's Computation by using Eviews11(See Appendix H)

Note**:** The ***, **,** and * sign indicate the significance of the coefficients at 1, 5, and 10 percent, significant level respectively.

From table (4.6), it is inferred that there is long-run causality between Foreign aid(ODA) and economic growth(LnRGDP). Since the value of the coefficient is negative and significant it reveals that economic growth has granger cause of foreign aid. This means there is a unidirectional causality running from economic growth to foreign aid in the long run. The result is consistent with (Mahembe & Odhiambo, 2019) in developing countries but, disagreement with (Tesfahun, 2014) in Ethiopia. On the other hand, the Wald statistics indicate the short-run causal effects between the two variables and the Wald statistics result reveals that there is an absence of a causal relationship between foreign aid and economic growth in the short run.

CHAPTER FIVE

CONCLUSION AND POLICY RECOMMENDATIONS

5.1. Conclusion

This study examined the Causal linkage between foreign aid and economic growth in Ethiopia during the period from 1981 to 2020. The study employed ARDL bound test approach to cointegration and error correction model to examine the long-run and short-run relationship between economic growth and explanatory variables and VECM Granger causality used to investigate the direction of causality between foreign aid and economic growth. Moreover, studies have analyzed the trend and performance of Foreign aid and Economic growth in Ethiopia. Before employing the ARDL model, the study has tested the stationarity properties of the variables by using ADF tests. The results of the unit root test reveal that some variables are stationary at levels and others after the first difference. Regarding diagnostic and stability tests, the result shows that the model is stable and desirable in long run without any evidence of serial autocorrelation, non-normality, and heteroscedasticity as well as no evidence for a structural break. The bound test approach to cointegration indicated that the bound test (F-statistic) value is greater than the upper critical value which indicates there is a long-run relationship between economic growth and their respective determinant.

The empirical results implied evidence of a long-run and short-run negative impact of foreign aid on the economic growth of Ethiopia and unlike the theoretical view, squared foreign aid has got insignificant a positive sign, indicating that did not show whether the foreign aid has diminishing returns or not in Ethiopia situation. The long-run and short-run result shows that a one percent increase in foreign aid, by holding other things constant, has resulted in 0.057 and 0.031 percent decrease in real GDP respectively. Therefore, it is concluded that; there might be a possible reason behind the negative impact result of foreign aid on Ethiopian economic growth. This might be that the inflow of foreign aid received in the form of grants and loans is spent to use for daily expense on the consumption of goods and services rather than building a fixed investment, which is used to accelerating economic growth. Concerning control variables, except squared foreign aid and political instability, all variables significantly impact economic growth in the long run, such as gross capital formation, human capital, external debt, and inflation rate are a

positive impact on economic growth. Whereas total export and drought harm the economic growth of Ethiopia. In the short run, gross capital formation, total export, external debt, inflation rate, and drought are a significant impact on economic growth. Furthermore, VECM Granger causality tests indicated that the direction of causality is running from economic growth to foreign aid in the long run and no short-run causal relationship exists between foreign aid and economic growth. This study also found that economic growth during EPRDF (1992-2012) relatively strong in growth compared to the military regime (1974-1991). During the military period, the average growth rate of real GDP was 1.6 percent (real GDP per capita was -0.7%), while the average population growth was 2.5 percent, which indicates the growth rate in real GDP was far away from satisfactory points. However, economic growth is comparatively fast and beyond satisfactory during the EPRDF regime. The country has experienced strong economic growth in the current time (especially, since 2003/04) which has averaged 11.2% Real GDP growth. Moreover, the study found that foreign aid as a percentage of GDP is highest in 2002/03 which is 18.94, and continues to decline as a percentage of GDP starting from the maximum to 5.04% in 2019/20.

5.2. Policy Recommendations

Based on the finding of the study, the following policy recommendation forwarded:

- The government should minimize dependence on foreign aid, and work to bridge gaps of the financial source by setting policies to increase domestic saving which is believed as a backbone of economic growth. This includes increase saving mobilization like selling of government bonds, expanding financial institutions, and strengthening existing saving tools.

- The government should give greater attention by continuing the current trend to invest in infrastructures that are the engines for economic growth.
- To enhance the contribution of human capital the government should increase both the quantity and quality of education, and provide basic and improved health services to society.
- Total export has a significant negative impact on economic growth in Ethiopia. So the government should give special emphasis and treatment on the export sector to develop it from its infant stage and save foreign currencies.

- Government should increase mobilization of resources from an external source in the form of debt and the wise and proper utilization by investing in selective and productive sectors.
- The inflation rate has as unexpected positive sign for this research. But moderate inflation is important for economic growth because it increases or creates a supply of goods and services. So the government should keep it as much as possible.
- The government should give high priority to the drought response effort by improving the system of drought response through improving the disaster management policy.

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APPENDIXES

Appendix A: Estimating the optimal order of VAR

VAR Lag Order Selection Criteria
Endogenous variables: LNRGDP ODA ODA2 LNGCF LNHC LNEXT LNEXD INF DU...
Exogenous variables: C
Date: 06/15/21 Time: 03:40
Sample: 1 40
Included observations: 38

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-556.3572	NA	4.177122	29.80827	30.23922	29.96160
1	-347.7143	296.4925	0.016274	24.09022	28.83061*	25.77682
2	-181.6643	148.5711*	0.001705*	20.61391*	29.66373	23.83376*

* 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

Appendix B:Variables addition test

Dependent variable: LNRGDP
Method: ARDL
Date: 05/28/21 Time: 05:29
Sample (adjusted): 3 40
Included observations: 38 after adjustments
Maximum dependent lags: 2 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (2 lags, automatic): ODA ODA2 LNGCF LNHC LNEXT LNEXD INF DUM1 DUM2
Fixed regressors: C
Number of models evalulated: 39366
Selected Model: ARDL(1, 2, 0, 1, 2, 1, 2, 2, 1, 2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNRGDP(-1)	0.363306	0.136363	2.664249	0.0185
ODA	-0.030737	0.012596	-2.440132	0.0286
ODA(-1)	-0.024465	0.010104	-2.421197	0.0296
ODA(-2)	0.019154	0.007148	2.679835	0.0180
ODA2	0.000503	0.000415	1.210574	0.2461
LNGCF	0.247037	0.074093	3.334172	0.0049
LNGCF(-1)	0.130013	0.089561	1.451667	0.1686
LNHC	0.010749	0.017309	0.621026	0.5446
LNHC(-1)	0.028628	0.029384	0.974267	0.3465
LNHC(-2)	0.053659	0.036206	1.482067	0.1605
LNEXT	0.106856	0.085095	1.255735	0.2298
LNEXT(-1)	-0.254653	0.085685	-2.971985	0.0101
LNEXD	-0.030055	0.018767	-1.601486	0.1316
LNEXD(-1)	0.089225	0.020279	4.399885	0.0006
LNEXD(-2)	0.030443	0.020572	1.479851	0.1611
INF	0.001524	0.000973	1.566485	0.1396
INF(-1)	0.002090	0.000957	2.185140	0.0464
INF(-2)	0.002403	0.000988	2.431511	0.0291
DUM1	-0.030543	0.061432	-0.497181	0.6268
DUM1(-1)	0.078824	0.058728	1.342182	0.2009
DUM2	-0.098647	0.052476	-1.879851	0.0811
DUM2(-1)	-0.050371	0.045808	-1.099608	0.2901
DUM2(-2)	-0.072912	0.048836	-1.493007	0.1576
C	4.060264	0.891147	4.556221	0.0004

R-squared	0.998682	Mean dependent var	12.59420
Adjusted R-squared	0.996516	S.D. dependent var	0.897715
S.E. of regression	0.052986	Akaike info criterion	-2.772957
Sum squared resid	0.039305	Schwarz criterion	-1.738692
Log likelihood	76.68618	Hannan-Quinn criter.	-2.404973
F-statistic	461.1682	Durbin-Watson stat	2.356397
Prob(F-statistic)	0.000000		

Appendix C: Diagnostic Tests

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

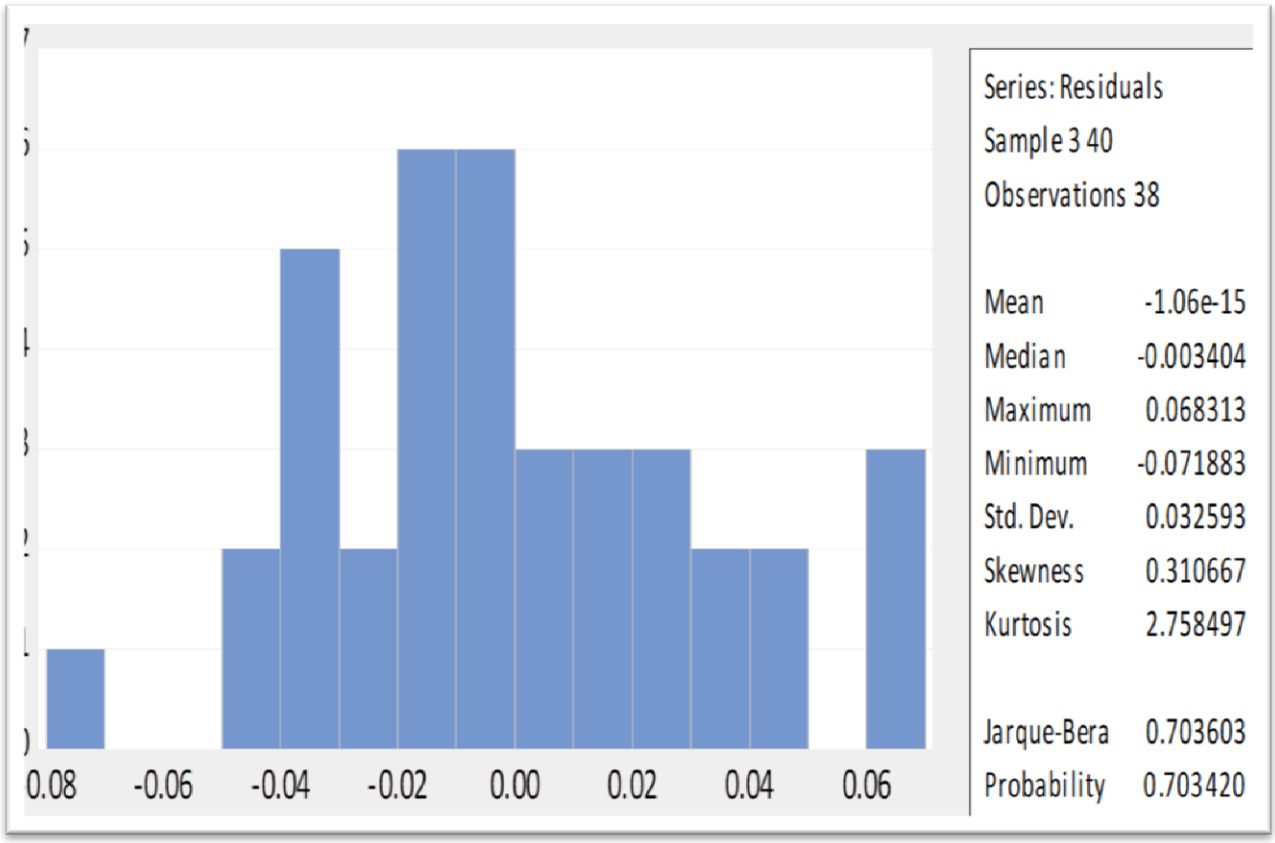
F-statistic	0.851054	Prob. F(2,12)	0.4512
Obs*R-squared	4.720451	Prob. Chi-Square(2)	0.0944

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 05/28/21 Time: 05:30
Sample: 3 40
Included observations: 38
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP(-1)	0.109969	0.175777	0.625615	0.5433
ODA	-0.002535	0.015410	-0.164478	0.8721
ODA(-1)	0.002920	0.011644	0.250769	0.8062
ODA(-2)	0.000376	0.007264	0.051796	0.9595
ODA2	2.87E-05	0.000477	0.060176	0.9530
LNGCF	-0.000334	0.083170	-0.004012	0.9969
LNGCF(-1)	-0.083203	0.123859	-0.671757	0.5145
LNHC	0.005317	0.018757	0.283442	0.7817
LNHC(-1)	0.018781	0.033246	0.564908	0.5825
LNHC(-2)	-0.025117	0.050127	-0.501068	0.6254
LNEXT	-0.003843	0.094314	-0.040748	0.9682
LNEXT(-1)	0.007626	0.091678	0.083183	0.9351
LNEXD	0.000737	0.019283	0.038229	0.9701
LNEXD(-1)	0.001071	0.022121	0.048413	0.9622
LNEXD(-2)	-0.002404	0.021977	-0.109363	0.9147
INF	-0.000159	0.000999	-0.158985	0.8763
INF(-1)	-0.000118	0.000982	-0.120394	0.9062
INF(-2)	-0.000698	0.001167	-0.598139	0.5609
DUM1	0.046034	0.075031	0.613539	0.5510
DUM1(-1)	-0.026645	0.070197	-0.379571	0.7109
DUM2	0.012935	0.053969	0.239673	0.8146
DUM2(-1)	-0.009927	0.048416	-0.205037	0.8410
DUM2(-2)	-0.001427	0.050113	-0.028466	0.9778
C	-0.493762	1.066919	-0.462792	0.6518
RESID(-1)	-0.532792	0.430457	-1.237734	0.2395
RESID(-2)	-0.059210	0.439298	-0.134784	0.8950

R-squared	0.124222	Mean dependent var	-1.06E-15
Adjusted R-squared	-1.700314	S.D. dependent var	0.032593
S.E. of regression	0.053559	Akaike info criterion	-2.800337
Sum squared resid	0.034422	Schwarz criterion	-1.679883
Log likelihood	79.20640	Hannan-Quinn criter.	-2.401688
F-statistic	0.068084	Durbin-Watson stat	2.021599
Prob(F-statistic)	1.000000		

Normality test



Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.603573	Prob. F(23,14)	0.8630
Obs*R-squared	18.91971	Prob. Chi-Square(23)	0.7059
Scaled explained SS	2.257954	Prob. Chi-Square(23)	1.0000

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/28/21 Time: 05:33
Sample: 3 40
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.027246	0.026931	1.011688	0.3289
LNRGDP(-1)	-0.001918	0.004121	-0.465491	0.6487
ODA	-0.000382	0.000381	-1.004521	0.3322
ODA(-1)	-0.000109	0.000305	-0.358016	0.7257
ODA(-2)	-0.000210	0.000216	-0.972286	0.3474
ODA2	8.95E-06	1.25E-05	0.713568	0.4872
LNGCF	0.000625	0.002239	0.279195	0.7842
LNGCF(-1)	-0.000468	0.002707	-0.172949	0.8652
LNHC	0.000190	0.000523	0.363262	0.7218
LNHC(-1)	0.000238	0.000888	0.268109	0.7925
LNHC(-2)	-0.000258	0.001094	-0.235984	0.8169
LNEXT	0.001843	0.002572	0.716559	0.4854
LNEXT(-1)	-0.001879	0.002589	-0.725625	0.4800
LNEXD	0.000618	0.000567	1.089840	0.2942
LNEXD(-1)	0.000102	0.000613	0.165828	0.8707
LNEXD(-2)	-0.000221	0.000622	-0.355870	0.7272
INF	3.08E-05	2.94E-05	1.047523	0.3126
INF(-1)	-7.92E-07	2.89E-05	-0.027397	0.9785
INF(-2)	-1.01E-05	2.99E-05	-0.337800	0.7405
DUM1	0.000171	0.001857	0.092063	0.9280
DUM1(-1)	-0.001393	0.001775	-0.784893	0.4456
DUM2	-0.001714	0.001586	-1.080563	0.2982
DUM2(-1)	-0.001285	0.001384	-0.927967	0.3691
DUM2(-2)	-0.001696	0.001476	-1.149287	0.2697

R-squared	0.497887	Mean dependent var	0.001034
Adjusted R-squared	-0.327012	S.D. dependent var	0.001390
S.E. of regression	0.001601	Akaike info criterion	-9.771420
Sum squared resid	3.59E-05	Schwarz criterion	-8.737155
Log likelihood	209.6570	Hannan-Quinn criter.	-9.403436
F-statistic	0.603573	Durbin-Watson stat	2.620435
Prob(F-statistic)	0.863017		

Ramsey RESET Test
Equation: UNTITLED
Omitted Variables: Squares of fitted values
Specification: LNRGDP LNRGDP(-1) ODA ODA(-1) ODA(-2) ODA2 LNGCF LNGCF(-1) LNHC LNHC(-1) LNHC(-2) LNEXT LNEXT(-1) LNEXD LNEXD(-1) LNEXD(-2) INF INF(-1) INF(-2) DUM1 DUM1(-1) DUM2 DUM2(-1) DUM2(-2) C

	Value	df	Probability
t-statistic	2.132421	13	0.0526
F-statistic	4.547218	(1, 13)	0.0526
Likelihood ratio	11.39795	1	0.0007

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.010186	1	0.010186
Restricted SSR	0.039305	14	0.002807
Unrestricted SSR	0.029119	13	0.002240

LR test summary:

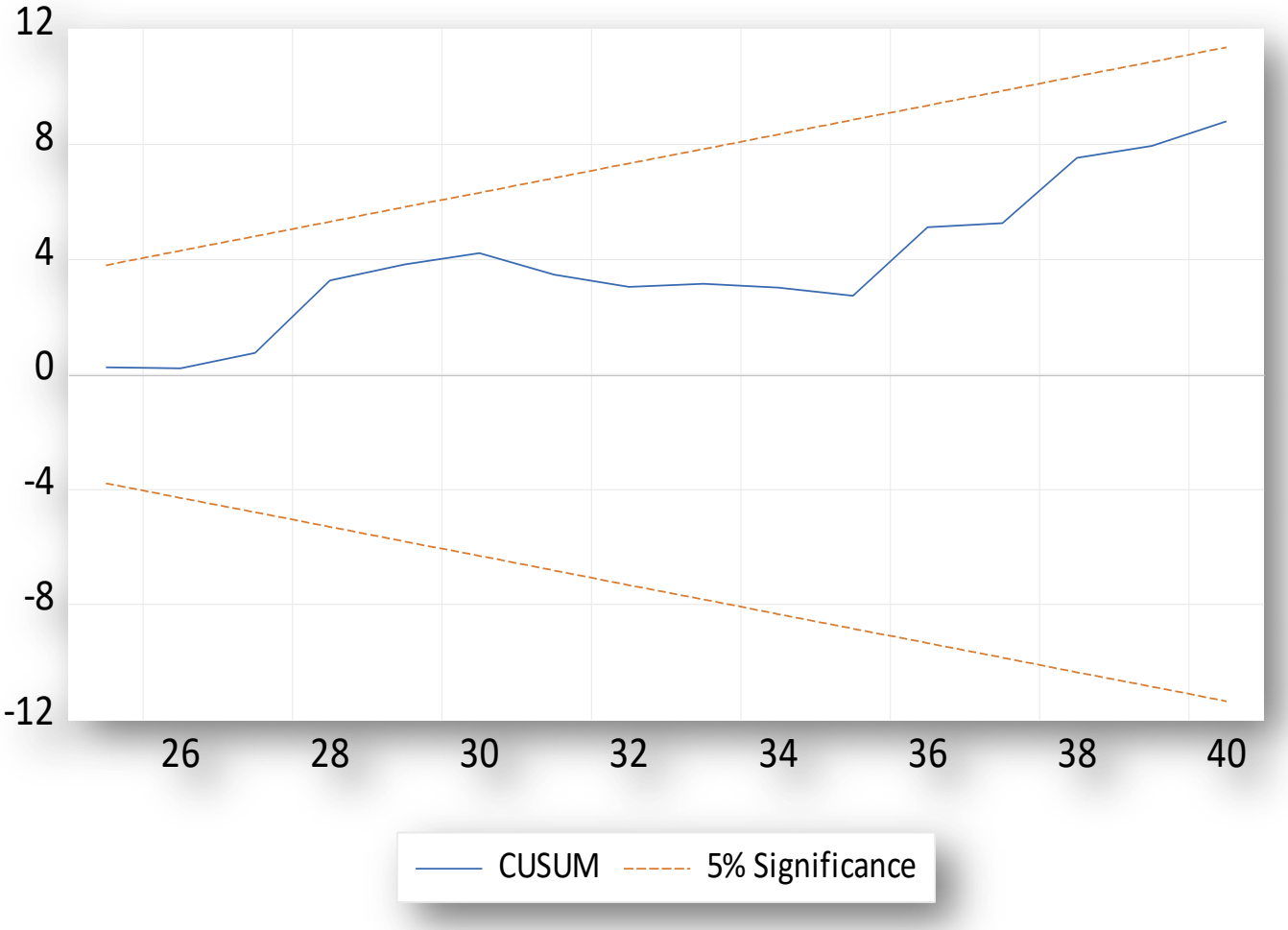
	Value
Restricted LogL	76.68618
Unrestricted LogL	82.38516

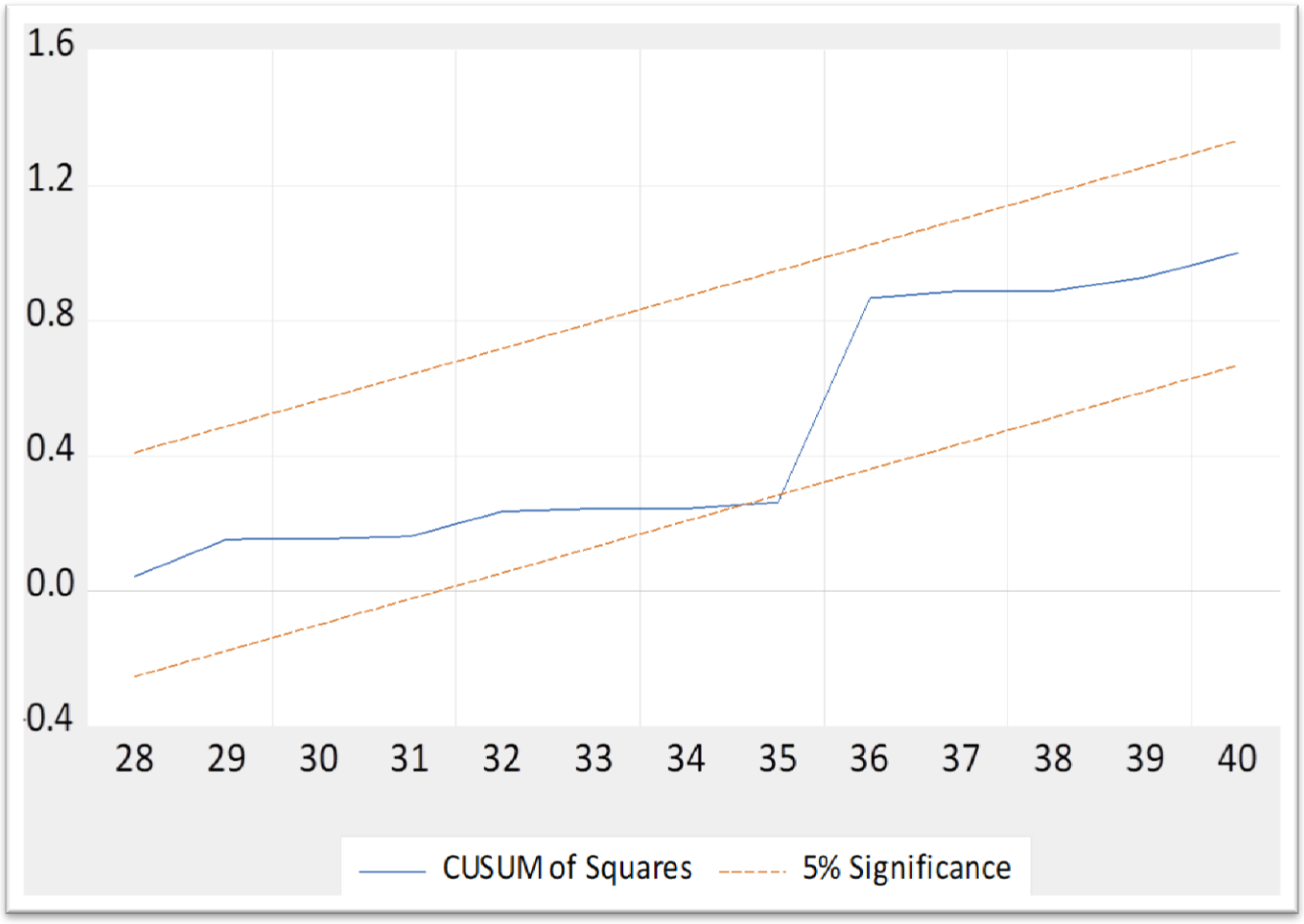
Unrestricted Test Equation:
Dependent Variable: LNRGDP
Method: Least Squares
Date: 06/17/21 Time: 03:49
Sample: 3 40
Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRGDP(-1)	-0.548795	0.444735	-1.233982	0.2391
ODA	0.029534	0.030421	0.970830	0.3494
ODA(-1)	0.020435	0.022909	0.892030	0.3886
ODA(-2)	-0.012172	0.016018	-0.759897	0.4609
ODA2	-0.000249	0.000512	-0.486771	0.6345
LNGCF	-0.195682	0.217907	-0.898008	0.3855
LNGCF(-1)	-0.140058	0.149800	-0.934969	0.3668
LNHC	0.015157	0.015598	0.971696	0.3489
LNHC(-1)	-0.024102	0.036060	-0.668385	0.5156
LNHC(-2)	-0.049139	0.058050	-0.846493	0.4126
LNEXT	-0.083554	0.117263	-0.712535	0.4887
LNEXT(-1)	0.318481	0.279456	1.139644	0.2750
LNEXD	0.041174	0.037374	1.101699	0.2906
LNEXD(-1)	-0.094649	0.088110	-1.074215	0.3023
LNEXD(-2)	-0.028727	0.033280	-0.863192	0.4037
INF	-0.000373	0.001243	-0.299807	0.7691
INF(-1)	-0.001122	0.001732	-0.647728	0.5284
INF(-2)	-0.001390	0.001986	-0.700172	0.4962
DUM1	0.023878	0.060517	0.394563	0.6996
DUM1(-1)	-0.041292	0.076972	-0.536456	0.6007
DUM2	0.104774	0.106288	0.985752	0.3422
DUM2(-1)	0.062101	0.066754	0.930302	0.3692
DUM2(-2)	0.105018	0.094155	1.115377	0.2849
C	9.728079	2.774558	3.506172	0.0039
FITTED^2	0.074440	0.034909	2.132421	0.0526

R-squared	0.999023	Mean dependent var	12.59420
Adjusted R-squared	0.997221	S.D. dependent var	0.897715
S.E. of regression	0.047328	Akaike info criterion	-3.020271
Sum squared resid	0.029119	Schwarz criterion	-1.942912
Log likelihood	82.38516	Hannan-Quinn criter.	-2.636955
F-statistic	554.1211	Durbin-Watson stat	2.475886
Prob(F-statistic)	0.000000		

Appendix D: Model stability




1.6
1.2
0.8
0.4
0.0
0.4
28
29
30
31
32
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35
36
37
38
39
40
CUSUM of Squares
5% Significance

Appendix E: Bound test

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.751277	10%	1.88	2.99
k	9	5%	2.14	3.3
		2.5%	2.37	3.6
		1%	2.65	3.97
Actual Sample Size	38		Finite Sample: n=40	
		10%	-1	-1
		5%	-1	-1
		1%	-1	-1
			Finite Sample: n=35	
		10%	-1	-1
		5%	-1	-1
		1%	-1	-1

t-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-4.669098	10%	-2.57	-4.56
		5%	-2.86	-4.88
		2.5%	-3.13	-5.18
		1%	-3.43	-5.54

Appendix F: ARDL Long run Form

Levels Equation
Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ODA	-0.056617	0.019460	-2.909340	0.0114
ODA2	0.000789	0.000650	1.214293	0.2447
LNGCF	0.592201	0.104901	5.645323	0.0001
LNHC	0.146124	0.048021	3.042954	0.0088
LNEXT	-0.232131	0.099780	-2.326432	0.0355
LNEXD	0.140747	0.042033	3.348486	0.0048
INF	0.009450	0.002226	4.245681	0.0008
DUM1	0.075831	0.089671	0.845660	0.4120
DUM2	-0.348567	0.153606	-2.269235	0.0396

EC = LNRGDP - (-0.0566*ODA + 0.0008*ODA2 + 0.5922*LNGCF + 0.1461 *LNHC -0.2321*LNEXT + 0.1407*LNEXD + 0.0094*INF + 0.0758*DUM1 -0.3486*DUM2)

Appendix, G: ARDL Short Run Regression

ARDL Error Correction Regression
Dependent Variable: D(LNRGDP)
Selected Model: ARDL(1, 2, 0, 1, 2, 1, 2, 2, 1, 2)
Case 3: Unrestricted Constant and No Trend
Date: 05/28/21 Time: 05:28
Sample: 1 40
Included observations: 38

ECM Regression
Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.060264	0.413064	9.829622	0.0000
D(ODA)	-0.030737	0.004914	-6.254873	0.0000
D(ODA(-1))	-0.019154	0.004698	-4.076808	0.0011
D(LNGCF)	0.247037	0.045262	5.457931	0.0001
D(LNHC)	0.010749	0.012039	0.892882	0.3870
D(LNHC(-1))	-0.053659	0.021031	-2.551388	0.0231
D(LNEXT)	0.106856	0.055808	1.914730	0.0762
D(LNEXD)	-0.030055	0.011009	-2.730088	0.0163
D(LNEXD(-1))	-0.030443	0.013535	-2.249220	0.0411
D(INF)	0.001524	0.000556	2.742355	0.0159
D(INF(-1))	-0.002403	0.000685	-3.506414	0.0035
D(DUM1)	-0.030543	0.031192	-0.979174	0.3441
D(DUM2)	-0.098647	0.025153	-3.921836	0.0015
D(DUM2(-1))	0.072912	0.027347	2.666205	0.0184
CointEq(-1)*	-0.636694	0.065501	-9.720353	0.0000

R-squared	0.928017	Mean dependent var	0.076530
Adjusted R-squared	0.884202	S.D. dependent var	0.121481
S.E. of regression	0.041339	Akaike info criterion	-3.246641
Sum squared resid	0.039305	Schwarz criterion	-2.600226
Log likelihood	76.68618	Hannan-Quinn criter.	-3.016651
F-statistic	21.18010	Durbin-Watson stat	2.356397
Prob(F-statistic)	0.000000		

Appendix H: VECM Granger Causality results

System: UNTITLED
Estimation Method: Least Squares
Date: 05/28/21 Time: 05:35
Sample: 4 40
ncluded observations: 37
Total system (balanced) observations 74

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.050363	0.025177	2.000339	0.0498
C(2)	-0.047162	0.183461	-0.257065	0.7980
C(3)	-0.167580	0.179052	-0.935929	0.3529
C(4)	-0.013018	0.009768	-1.332714	0.1875
C(5)	-0.009426	0.010033	-0.939554	0.3511
C(6)	0.093677	0.028349	3.304425	0.0016
C(7)	-1.026550	0.421093	-2.437822	0.0177
C(8)	1.663765	3.068443	0.542218	0.5896
C(9)	3.310900	2.994688	1.105591	0.2732
C(10)	0.106316	0.163373	0.650757	0.5176
C(11)	0.227816	0.167803	1.357644	0.1795
C(12)	-0.369056	0.474145	-0.778362	0.4393

Determinant residual covariance 0.040497

Equation: D(LNRGDP) = C(1)*(LNRGDP(-1) + 0.154277976257*ODA(-1) - 14.0319769164) + C(2)*D(LNRGDP(-1)) + C(3)*D(LNRGDP(-2)) + C(4)*D(ODA(-1)) + C(5)*D(ODA(-2)) + C(6)

Observations: 37

R-squared	0.184113	Mean dependent var	0.076004
Adjusted R-squared	0.052519	S.D. dependent var	0.123113
S.E. of regression	0.119836	Sum squared resid	0.445184
Durbin-Watson stat	1.907980		

Equation: D(ODA) = C(7)*(LNRGDP(-1) + 0.154277976257*ODA(-1) - 14.0319769164) + C(8)*D(LNRGDP(-1)) + C(9)*D(LNRGDP(-2)) + C(10)*D(ODA(-1)) + C(11)*D(ODA(-2)) + C(12)

Observations: 37

R-squared	0.203970	Mean dependent var	0.029307
Adjusted R-squared	0.075578	S.D. dependent var	2.084621
S.E. of regression	2.004298	Sum squared resid	124.5335
Durbin-Watson stat	1.902798		