



Università
Ca' Foscari
Venezia

Master's Degree
in Economics and Finance

Final Thesis

The Effect of Foreign Aid on Economic Growth
of Sub-Saharan Africa

Supervisor:

Prof. Michele Bernasconi

Graduand:

Marti Sonko

Matriculation Number:

883144

Academic Year:

2021/2022

Abstract

The study of economic growth in the field of development economics is a trending area of research in social sciences. Considering Sub-Saharan Africa as one of the largest recipients of foreign aid, examining the relationship between aid and economic growth in this region will be of great interest to both the donors and recipients. The outcome of such kind of research dictates for efficient allocation of aid. As such, this dissertation theoretically and empirically investigates the effect of Foreign Aid on the Economic Growth of Sub-Saharan African countries from 2000 to 2020. Panel Data for the sample of Forty-six Sub-Saharan Africa has been collected to run the econometric model of the regression.

Using panel data of the selected Sub-Saharan countries to employ fixed-effect models in order to ascertain underlying forces among the variables under consideration. I carry out various econometric tests to control other factors that might affect the empirical analysis. Amongst these are the heterogeneity tests to control for all variables that vary over the cross-sectional units, testing the presence of serial correlation in the error terms in fixed-effects regression model to avoid inefficient estimates, and biased standard errors, etc.

The empirical results of correlation matrix find that there exists a positive relationship between the principal variables (i.e economic growth and foreign aid) over the period under consideration. That is, the more aid Sub-Saharan African countries get the better the economic growth of the region is, *ceteris paribus*. On average, each one percent increase in foreign aid (i.e ODA) is expected to increase economic growth by \$ 2.45842.

Thus, Sub-Saharan Africa's poor economic growth may be contributed by other factors such as the political condition of the region therefore not attributed to aid ineffectiveness. These findings suggest a lesson that, there should be formidable economic development plans adopted by the government of considering countries in order to efficient and effective allocate aid to achieve sustainable economic growth.

Key Words

Development Economics, Foreign Aid, Economic growth, official development assistance, Sub Saharan African countries, Panel Data.

Acknowledgements

I express my deep and sincere gratitude to my thesis supervisor Prof. Michele Bernasconi for his insightful feedback and invaluable guidance throughout the writing of this dissertation. I also extend a word of appreciation to the entire teaching and administration committee of Master Economic-QEM at Ca 'Foscari University of Venice, Department of Economics particularly the coordinator of MSc. Quantitative Economics Method, Prof. Piero Dindo, for the academic support render to me during the coursework of the program.

Besides, my sincere thanks go to my previous school, The University of The Gambia (UTG), School of Business and Public Administration, and School of Art and Science. Additionally, my thanks also go to the referees of the journal for the suggestions which contribute to improving the quality of the research.

Most especially, I am indebted to my parents, siblings, cousins, and colleagues for their continued support in all forms. Being motivated, inspired, and entrusted by them keeps me focused on my vision. For these, I owe them gratitude.

Finally, the ultimate thanks go to God, for the blessing and for letting me through this program successfully.

Contents

Abstract	ii
Acknowledgements	iii
1 Introduction	1
2 Background	5
2.1 Regional Economic Outlook for Sub Saharan Africa	6
2.2 Trends in Foreign Aid in Sub-Saharan Africa	8
2.2.1 Aid as a Major Source of Foreign Capital For SSA Region	9
2.3 Foreign Aid and Economic Growth in Sub-Saharan Africa	10
3 Aid and Growth - Theoretical Framework	13
3.1 Harrod–Domar model	13
3.2 Solow–Swan model	15
3.3 Why should aid increases growth	21
3.4 Transmission Mechanisms	22
4 Literature Review	24
5 Methodology	36
5.1 Data Source and Variables	36
5.2 Models for Estimation	39
6 Empirical Results and Analysis	42
7 Conclusions	46
Bibliography	52

A Selected Countries in SSA for the Study	53
B Steady State in Solow Model	56
C Foreign Aid and Investment	59

Chapter 1

Introduction

The field of Development Economics focuses on analyzing the reasons for high disparity amongst countries and the mechanism to delve into in order to solve the economic problem of developing countries. Given the amount of available natural resources, the economic development policies and programs play a significant role in the economic development of countries. Due to domestic resource deficiency in financing long-term development projects, Sub-Saharan African countries have still been in much reliance on external financial sources. This external resource (Foreign Aid) has virtually contributed to the factor of production, whose productivity and allocation provide one of the central problems for a modern theory of development Economics. This dissertation studies the effects of a randomized controlled trial of unconditional cash transfer to Sub-Saharan Africa, SSA.

This paper extracts a research approach in development economics concerning the reliable identification of program effects of Foreign Aid in relation to economic development. The first instance of understanding the broader effects of Foreign Aid is to identify the effects on recipient countries from 2000 to 2020. The objective of foreign financial assistance to SSA is targeted to reduce poverty. Yet still, the effectiveness of foreign aid in helping to reduce poverty and economic growth in low-income countries such as Sub-Saharan Africa has been questioned.

According to the French Development Agency ([AFD](#)), aid comes within the framework of the [SDGs, Sustainable Development Goals](#) that have been set by the United Nations for the 2015-2030 period. In the 3DS Development aid is also one aspect of a country's international policy. One yardstick of the effectiveness of foreign aid is economic growth, and this has been re-validated by a number of studies to be a necessary condition for the achievement of sustained development and poverty reduction (Dollar and Kraay, 2002) [[16](#)]. Although the necessity of economic growth

is unchallenged, the idea that foreign aid is needed to promote growth in developing countries remains highly challenged and controversial (Snowdon, 2009)[43].

The most common type of foreign aid is official development assistance (ODA), which is the assistance given to promote development and to combat poverty. Official development assistance (ODA) is defined by the OECD [38] Development Assistance Committee (DAC) as government aid that promotes and specifically targets the economic development and welfare of developing countries. According to OECD, foreign direct investment FDI complements the following area: triggers technology spillovers, promote human capital formation, contributes to international trade integration, assists in creating a more competitive business environment, and enhances enterprise development. All of which are geared toward economic growth. The effectiveness of ODA is measured with regard to economic growth, which has been confirmed by numerous empirical studies to be a requirement for the achievement of sustained economic development.

Official Development Assistance (OAD) is either provided bilaterally, from donor to recipient or channelled through a multilateral development agency such as the United Nations or the World Bank [15]. ODA is mainly given out to balance the economic challenges in developing countries, that is to promote the economic growth and welfare. However, loans and credits for military purposes are excluded from ODA, as the loan is given for temporary support in the balance of payments difficulties. It should also be not confused with grants which are support for development purposes i.e., project assistance, which covers the cost of capital goods and technical assistance, training facilities abroad, and supply of equipment for the purpose of training. In short, grant are meant to fund some beneficial projects.

From a broadly perspective, the Official Development Aid definition by OECD refers to the flows of official financing given with the objective to promote economic development and welfare in developing countries and are concessional with a grant element of at least 25 percent (using a fixed 10 percent rate of discount). The question in the mind of the researcher/intellectual is why countries give aid? According to Chenery and Strout (1966) [12] primary objective of foreign aid by donors and recipients agree to based on the economic and social development rather than a programs of foreign assistance that is based on colonial relations.

The type of aid to be focused on in this research is official development assistance, which is the assistance given to promote development and to combat poverty in developing countries. Generally, aid takes many forms but can be classified into two broad categories: development aid (comprising project aid, program aid, and technical assistance) and emergency assistance. Most of the ODA is bilateral grants from one country to another, though some of the aids are in the form of loans, and

sometimes the aid is given by international organizations and nongovernmental organizations (NGOs). For example, the International Monetary Fund (IMF), the World Bank, and the United Nations Children's Fund (UNICEF) have provided significant amounts of aid to countries and to NGOs involved in assistance activities to support low developing economies. However, emergency assistance is mainly intended to provide temporary relief from the effects of natural disasters and other destructive events such as war, rather than to stimulate economic growth and development in order to speedily recover the affected economy. Foreign aid may be used also to achieve a country's diplomatic goals, enabling it to gain diplomatic recognition such as the recent connection of China and most African countries, to gather support for its positions in international organizations.

The primary objective of this dissertation is to examine the effect of foreign aid on economic growth of sub-Saharan Africa (SSA). The study will use panel data from forty-six Sub-Saharan African countries over the period 2000 to 2020 with the use of econometric model of fixed-effect to determine the effect of the variables . The paper will contribute to aid-effectiveness literature of SSA. Additionally, this study has been designed to explore to what extend foreign aid impact the Sub-Saharan Africa countries' economies. As such, it measures aid effectiveness as a tool for realizing sustainable development growth. Outcomes of the research can make the possibility in framing and implementation of appropriate policies by both sets of countries which will maximize benefits accruing from the process.

This paper is significant mainly for the following reason. First, the examination of foreign aid's effect on the economic growth of Sub-Saharan Africa, as the main objective of this research will contribute to the existing literature on foreign aid and growth. Thereby serving as a guideline for the student who wants to make further study in this area. Second, the study of aid effects in sub-Saharan Africa has specific benefits for both donors and recipients. Foreign aid is more of an investment form, aid to developing economies enables them to build up and become sustainable states. For example, U.S. foreign aid to Japan after the Second World War helped recover Japan's infrastructure and highly contributed to the success of American companies like Microsoft. The findings can improve understanding of the effective allocation of aid to recipient countries and under which circumstances aid is most effective considering the political, economic, and social environment. Thus, the research can facilitate the design and implementation of economic policies that are capable of improving aid effectiveness, as well as enhance the capacity of aid-recipient countries how to effectively use aid so as to make the realization of Sustainable Development Goals (SDGs).

The presentation of the study first outlines a theoretical framework designed

to analyze the process of development in the literature then follow by quantitative analysis with the use of panel data of selected Sub-Saharan African countries, and economic variables under consideration.

The rest of the paper is organized as follows. Chapter.2 presents the Background with a subsection of Regional Economic Outlook for Sub Saharan Africa discuss some, Trends in Foreign Aid in Sub-Saharan Africa, and Foreign Aid and Economic Growth in Sub Saharan Africa that discusses some stylized facts on aid flows and economic growth in Sub-Saharan Africa. Chapter.3 presents Aid and Growth - Theoretical Framework with the section on theories and models for Economic Growth, and Transmission Mechanisms. Chapter.4 discusses conflicts in the literature (i.e., Literature Review). Chapter.5 presents Methodology Framework; Data Source and Models for Estimation. Chapter.6 report the Empirical Results and Analysis. finally, chapter.7 to discuss the conclusions.

Chapter 2

Background

Official development assistance characterizes as Foreign Aid aims primarily to promote the economic development and welfare of recipient countries; it is usually measured by its impact on economic growth. However, aid is rarely allocated according to needs but more often allocated according to strategic considerations of donor countries (Todaro and Smith, 2003) [47]. In recent years, economists and policy-makers have debated whether aid has any positive effect on economic growth, more generally whether foreign aid complements forces for economic development in developing countries, particularly Sub-Saharan Africa. Recently, there have been a lot of theories that debate on this topic. However, there are contradictory results from the finding of the available works of literature. This chapter will focus on the economic outlook of Sub-Saharan African, Aid and economic growth relation, etc.

According to Peter Bauer [37], who was considered a pioneering critic of foreign aid, he characterized Foreign Aid as the transfer of resources from the taxpayer of a donor country to the government of recipient countries. Notwithstanding, Bauer stated that foreign Aid providers do not know the appropriate investment for the recipient economy, so aid money is used to finance bad projects which not only fail to promote economic development but also divert the limited resources away from the productive sector. As such there are misallocation of scarce resources and undermining of economic growth in the developing economy, from the analysis of Peter Bauer (Bauer, 1975). According to Bauer [37], “Development aid is ... not necessary to rescue poor societies from a vicious circle of poverty. Indeed, it is far more likely to keep them in that state. It promotes dependence on others. furthermore, It encourages the idea that emerging from poverty depends on external donations rather than on people’s own efforts, motivation, arrangements, and institutions” (Bauer, 1976) [7].

Initial studies of the macroeconomic impact of foreign aid focused on associations between aid, domestic saving, and growth. The classification models in assessing the regression analysis were based on Harrod-Domar and Solow type models providing the theoretical basis for regressions. However, the recent literature adds more into the analysis, the aid effectiveness literature has drawn on a growing empirical growth literature to employ more sophisticated models and statistical tests, and to address some of the econometric weaknesses of earlier studies. The new theoretical frame of aid literature emphasizes more careful consideration to the incentives in the donor-recipient relationship and how these might encourage recipient governments to pursue policies that maintain aid dependence and undermine economic growth. Policy adopted by the government of developing countries mostly derives government projects.

2.1 Regional Economic Outlook for Sub Saharan Africa

The COVID-19 pandemic put the Sub-Saharan African countries in a serious economic crisis. Within a few months of the spread of the virus, the economic development process has been jeopardized, threatening the lives and livelihoods of people. From the latest [Regional Economic Outlook](#), it projects -3 percent growth in sub-Saharan Africa's GDP in 2020, representing the worst outcome on record for the region. Without significant additional Aids, many sub-Saharan African countries will be challenged in order to maintain macroeconomic stability while meeting the basic needs of their populations. Sub-Saharan Africa's economy is set to expand by 3.7 percent in 2021 and 3.8 percent in 2022. This follows the sharp contraction in 2020 and is much welcome, but still represents the slowest recovery relative to other regions. [Figure.2.1](#) below showcases the real GDP of sub-Saharan African countries in four categories in accordance with income scales: SSA low-income countries, SSA middle-income countries, SSA oil-exporting countries, SSA countries in fragile situations and the aggregate real GDP. [Figure.2.1](#) represent the real GDP growth of the different categories in relation to the aggregate growth of Sub-Saharan Africa.

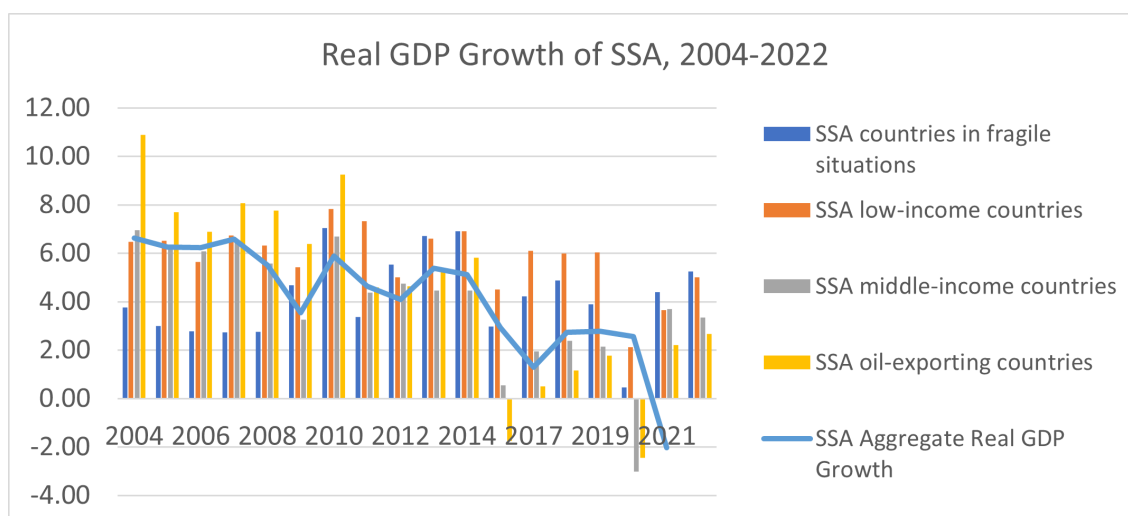


Figure 2.1: Source: Derived From World Bank national accounts data, and OECD National Accounts data

The economic impact of the COVID-19 shock in Sub-Saharan Africa is severe. The trend of aggregate GDP falls heavily from 2020 to 2021 as shown in the Figure.2.1.

Headline inflation has been driven largely by higher food prices. Average food price inflation had been accelerating in sub-Saharan Africa even before the pandemic, from 2 percent year-over-year in 2019 to about 11 percent in 2021. This surge reflects domestic factors such as poor weather and conflict-related supply disruptions. It also mirrors global conditions, in which global food prices increased by about 30 percent in August (year-over-year) amid higher oil prices, weather-related shocks, export restrictions by key exporters, and stockpiling in some countries, According to the [Report of Regional Economic Outlook Sub-Saharan Africa](#) (P.11).

Tourism-dependent countries such as Cabo Verde, and Mauritius face a particularly challenging recovery from Covid-19. The pandemic has underscored the vulnerability of these economies to global shocks to travel and tourism. The Gambia through inflows of remittance improves private consumption. In comparison, the Gambia experienced an alternating change in real GDP, with its worse value in 2011 value -8.13. The pandemic had a negative effect on its economy but due to high remittance contributed to its positive change in real GDP unlike other tourism-dependent countries such as Mauritius. The Figure.2.2 below shows the percentage changing pattern of the Real GDP of the Gambia compared to the aggregate Real GDP of the rest of the Sub-Sahara African Countries.

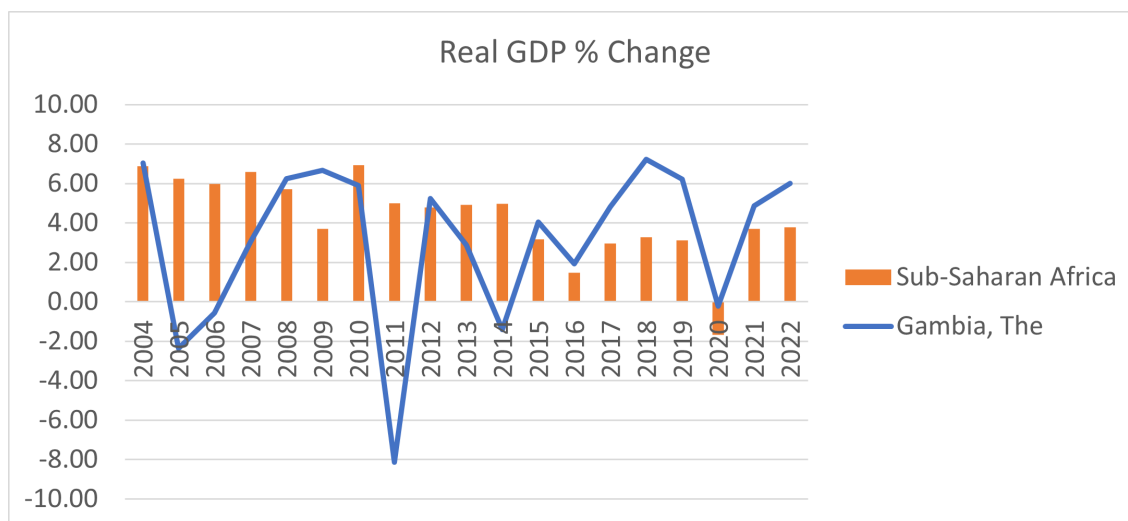


Figure 2.2: Source: Derived from IMF Data of Regional Economic Outlook for Sub-Saharan Africa

2.2 Trends in Foreign Aid in Sub-Saharan Africa

Sub-Saharan African countries have been one of the largest recipients of official foreign aid since from attainment of independents. The objectives of these aids are to promote economic growth and development. The agenda 2063 and sustainable development goals aim is to transform the economies of developing countries into superpower countries. With the understanding of economic challenges in sub-Saharan African countries, many developed nations and global development institutions provide development assistance to positively affect the economy of the region to achieve Sustainable Development Goals. Figure.2.3 Show the trend of net official development assistance and official aid received by Sub-Saharan Africa.

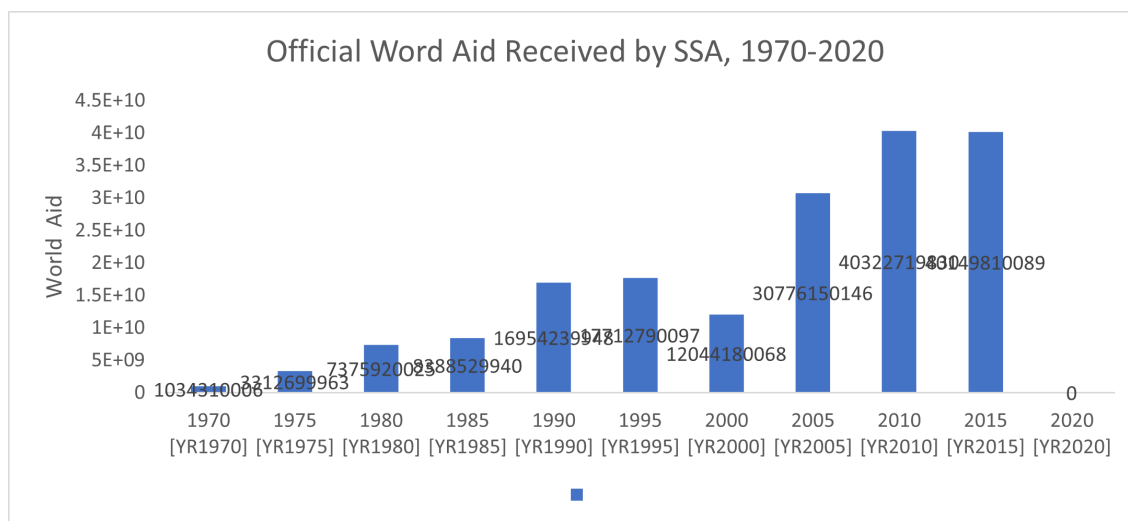


Figure 2.3: Source: Derived From World Bank data of Net official development assistance

Official development aid to sub-Saharan Africa has significantly increased from early 2000 toward 2020 following sharply falling from the early 1995 toward 2000 (see Figure.2.3). However, the decline in aid amounts to sub-Saharan Africa from 1995 to 2000 was not entirely due to an overall contraction in world aid but rather a high share allocation towards other regions such as South Asian Countries.

2.2.1 Aid as a Major Source of Foreign Capital For SSA Region

In Sub-Saharan Africa, the Major sources of foreign capital are foreign aid, Foreign Direct Investments, and personal remittances. Foreign aid contributes the highest among the three sources of foreign capital. From the trend in the figure 2.4, foreign aid inflows to the SSA region increased from \$10.93 in 1977 to \$49.90 in 2019. Compared to others for the same index, personal remittances increased from \$0.50 to \$2.52 and Foreign Direct Investments increased from \$0.45 to \$1.77. This shows the importance of foreign aid as an important source of foreign capital for the SSA region. Graph.2.4 shows its trend.

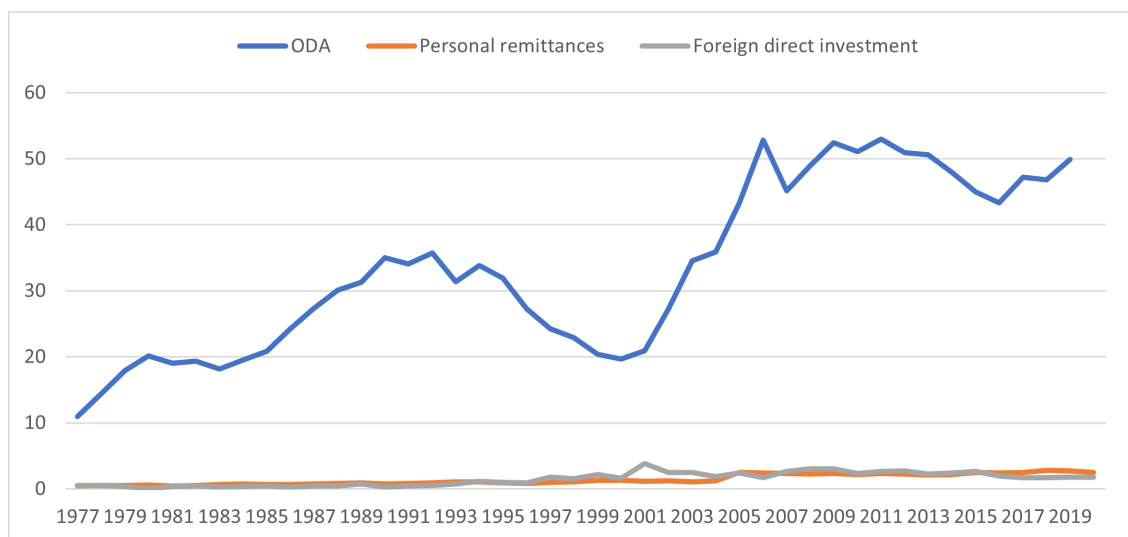


Figure 2.4: Source: Derive from World bank Data

2.3 Foreign Aid and Economic Growth in Sub-Saharan Africa

The theories of economic development find out ways by which a poor, stagnant economy or low developed countries can be transformed into a sustainable growth economy. Generally, there is agreement on the principal changes that characterize this transformation, and these are: an increase in human skills, a rise in the level of investment and saving, the adoption of more productive technology, a substantial change in the composition of output and employment, the development of new institutions and development policies, etc. There has been relatively little analysis, however, of the possibility of accelerating these changes through the use of significant amounts of external resources over a limited period of time.

However, a country on a path of economic transformation without external assistance must provide for all of the requirements of accelerated growth from its own available resources or from imports paid by exports. To an extent, success thus requires a simultaneous increase in skills, domestic savings, and export earnings as well as an allocation of these increased resources in such a way as to satisfy the changing demands resulting from rising levels of income.

The impact of Foreign Aid on the growth of an economy can be judged by its

contribution to the mobilization and allocation of all productive resources. Most especially in the following sector: 1. The supply of skills and organizational ability; 2. the supply of domestic savings; and 3. the supply of imported commodities and services.

The perspective of macroeconomic policy and growth views a stable macroeconomic policy environment as a necessary condition for rapid growth and for effective aid allocation and implementation has been emphasized in recent studies. World Bank's view for structural adjustment which includes low and predictable inflation; appropriate real interest rates; real exchange rates which are competitive and predictable; stable and sustainable fiscal policy; and a balance of payments that is perceived as viable (World Bank, 1990) [1]. In addition, investments flow effectively in an economic environment where there is macroeconomic stability and few distortions. However, contractionary economic policies such as trade control and financial suppression are argued to disrupt the efficiency and effectiveness of capital investment and the rate of growth for a given level of capital investment. By removing distortionary policies does the reverse.

The Scatter plot in Graph.2.5 visualizes the association between average aid per capita and average GDP growth per capita of Sub Saharan Africa over 60 years, from 1960-2020. The axis titles are the vertical axis is the average aid per capita that Sub-Saharan African countries received over 60 years measured in US dollar. And on the horizontal axis, it is the average economic growth over the same period measured as the current US dollar of GDP growth per capita.

Graph.2.5: Relationship between Average Growth in GDP per capita and Net ODA received per capita (current US dollar) in Sub-Saharan Africa (1960-2020).

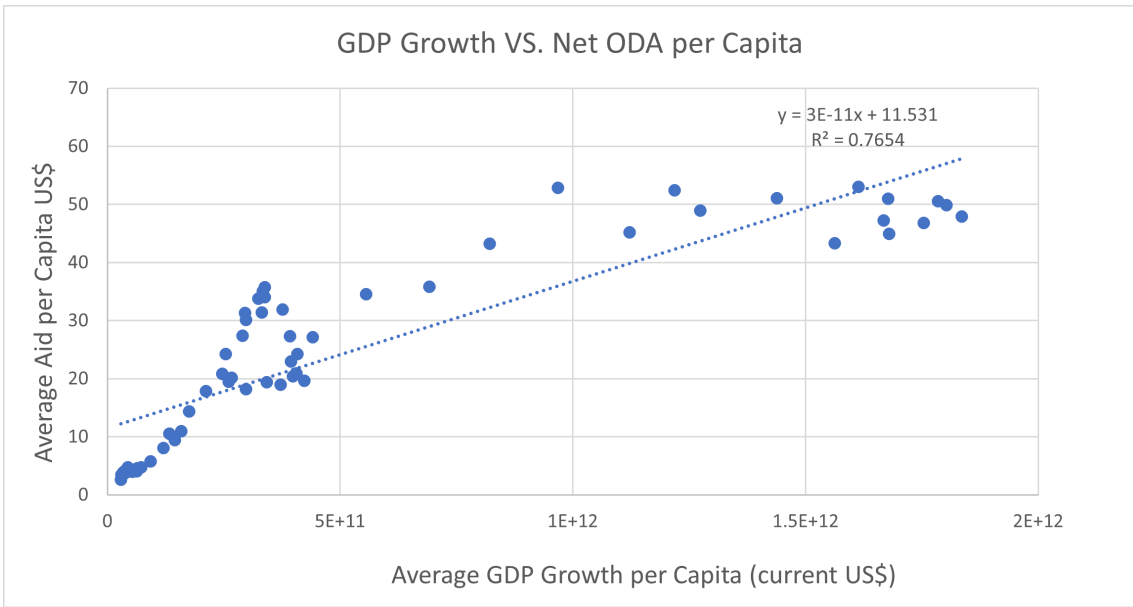


Figure 2.5: Source: Derive from World bank Data

The result of the analysis concludes with an R-squared of 0.76 approximately which indicates a better fit for the model as opposed to a relative low R-squared the fit line represents the positive association between Aid and Economic Growth.

Chapter 3

Aid and Growth - Theoretical Framework

Understanding economic growth, the emphasis is to process the growth theories and factor out the policies which contribute to growth, and the mechanism through which foreign aid can affect the growth process. However, theories change or develop over time. Below, I present some of the theories of economic growth and the mechanism through which foreign aid contributes to economic growth.

3.1 Harrod–Domar model

Using active government policy to manage aggregate demand in order to address economic recessions, Keynes paved the way for some economists to try to model and explain the long-run dynamics of economic growth. The Harrod–Domar model is the long-run dynamic version of Keynes’ short-run macroeconomic model. Using Leontief production technology Harrod-Domar model (Harrod (1939), Domar (1946)) attempted to explain an economy’s growth rate in terms of the level of saving and of capital, they emphasized the supply-side effect of an increase in productive capacity through investment. This is in contrast with the notion of increasing productive capacity through aggregate demand by Keynes. The Harrod–Domar model was the precursor to the exogenous growth (Solow–Swan model) model. Harrod–Domar model assumes constant returns to scale for the capital-output ratio and the propensity to save. The model assumes exogenous growth of labour force, constant capital to labour ratio, and constant capital to output ratio. It points out that Productivity and savings rate are the main determinants of economic growth. Below, shows the model.

$$G = (s/v - \delta) \tag{3.1}$$

Where G is the GDP growth rate, s is the fraction of the GDP, which is saved, v is the capital to output ratio and δ is the rate of depreciation for capital stock. The equation indicates that the higher the saving rate and lower the capital to output ratio, the faster will an economy grow. (Derivation of the model in Appendix B).

In the analysis, to reach equilibrium, the assumption of the fixed capital to output ratio requires that capital and output should grow at the same proportion. In addition, the assumption requires that capital should grow at the same rate as labor. In short, to be at equilibrium $n = G = (s/v - \delta)$, which is a requirement for in the long run. If the rate of labor is greater than GDP growth i.e., $n > G$, that will lead to increases in unemployment in the economy. On the other hand, if $G > n$, the capital stock will become idle and the growth rate will slow down until it reaches the equilibrium level $G = n$ (Snowdon & Vane 2005). Relating the analysis to foreign aid effects, aid serves as a supplement to domestic savings, which will be added to both the consumption and investment components.

However, the Leontief production function assumption of the imperfect substitutability and fixed capital to output ratio was criticized on the grounds that in labor-abundant countries, labor could be substituted for capital and vice versa. It was also argued that a lower economic growth rate could also be due to the lower productivity of the capital and not because of the constraints over the availability of capital.

Besides the weaknesses discussed in the Harrod-Domar model, economists used this model to predict the required rate of investment and the gap between saving and required investment, for the given growth rate. The model maintains that economic growth is required to maintain full employment. The GDP growth is determined by the availability and productivity of capital. Domestic saving determines the level of investment and which in turn determines the attainable growth rate in the economy. However, if the domestic savings are low then aid will fill this Saving-Investment gap. Easterly (2003) [18] assumption of the saving-investment gap that aid is used for investment and not for consumption, will be valid only when there is a shortage of domestic capital for investment and the return on investments are positive.

3.2 Solow–Swan model

From its basic in neoclassical economics theory, Solow’s economic growth model explains the long-run economic growth by looking into capital accumulation, population growth of labor, and technological progress. Technological possibilities are represented by a production function:

$$Y = F(K, L) \tag{3.2}$$

Cobb-Douglas production function is given:

$$Y(t) = K(t)^\alpha (A(t)L(t))^{(1-\alpha)} \quad 0 < \alpha < 1 \tag{3.3}$$

Where:

- $Y(t)$ is total production at time t ,
- K represents capital,
- L represents labor supply, and
- A represents technology progress.

The natural assumption to make in a theory of economic growth [44] i.e., the production function is assumed to show constant returns to scale. Hence, the production function is homogeneous in the first degree. Also, the output is taken as net output after making good the depreciation of capital.

The principal interest of the model is the dynamics of capital intensity. The growth rate of capital stock given by the key equation of the Solow–Swan model:

$$\dot{k} = sy(t) - (\delta + n + g)k(t) \tag{3.4}$$

The first term on the right-hand side, $sy(t)$, is the actual investment per unit of effective labor: s is the fraction of the output per unit of effective labor that is saved and invested. The second term, $(\delta + n + g)k(t)$ is the break-even investment; the amount of investment that must be invested to prevent k from falling. In the second term of the right-hand equation, δ is the depreciation rate, n is the growth rate of the labor force, and g represents the growth rate of technology which is exogenous. Convergence to steady state is obtained in the model at the level where:

$$sy(t) = (\delta + n + g)k(t) \tag{3.5}$$

$$k^* = \left(\frac{s}{(\delta + n + g)k(t)} \right)^{\left(\frac{1}{1-\alpha} \right)} \quad (3.6)$$

The equilibrium growth path is a steady state in which growth rate of capital equals the growth rate of output per labor. See appendix B for deriving Steady state.

The analysis of the model implies that equilibrium will be stable at steady-state, where y and k are constant over time. Before reaching the steady-state, investment is larger than depreciation. Thus, the economy will adjust to point k^* by increasing saving when capital stock per unit of labor is less than equilibrium amount of capital stock per unit of labor, i.e., at point k^* . Above the equilibrium level, the capital stock will decrease when depreciation exceeds investment until it reaches a steady state. The key assumption of Solow's model [44] is that it assumes that there are diminishing returns of capital in a closed economy. When the labor is fixed, the last unit of capital has less impact on output than the one before. The long-run growth can only be achieved by increase in technology progress. The model also implies that developing countries will catch up with rich countries. Because the Solow Growth Model predicts conditional convergence. Figure.3.1 shows the graphical presentation of Steady State in Solow model of economic growth.

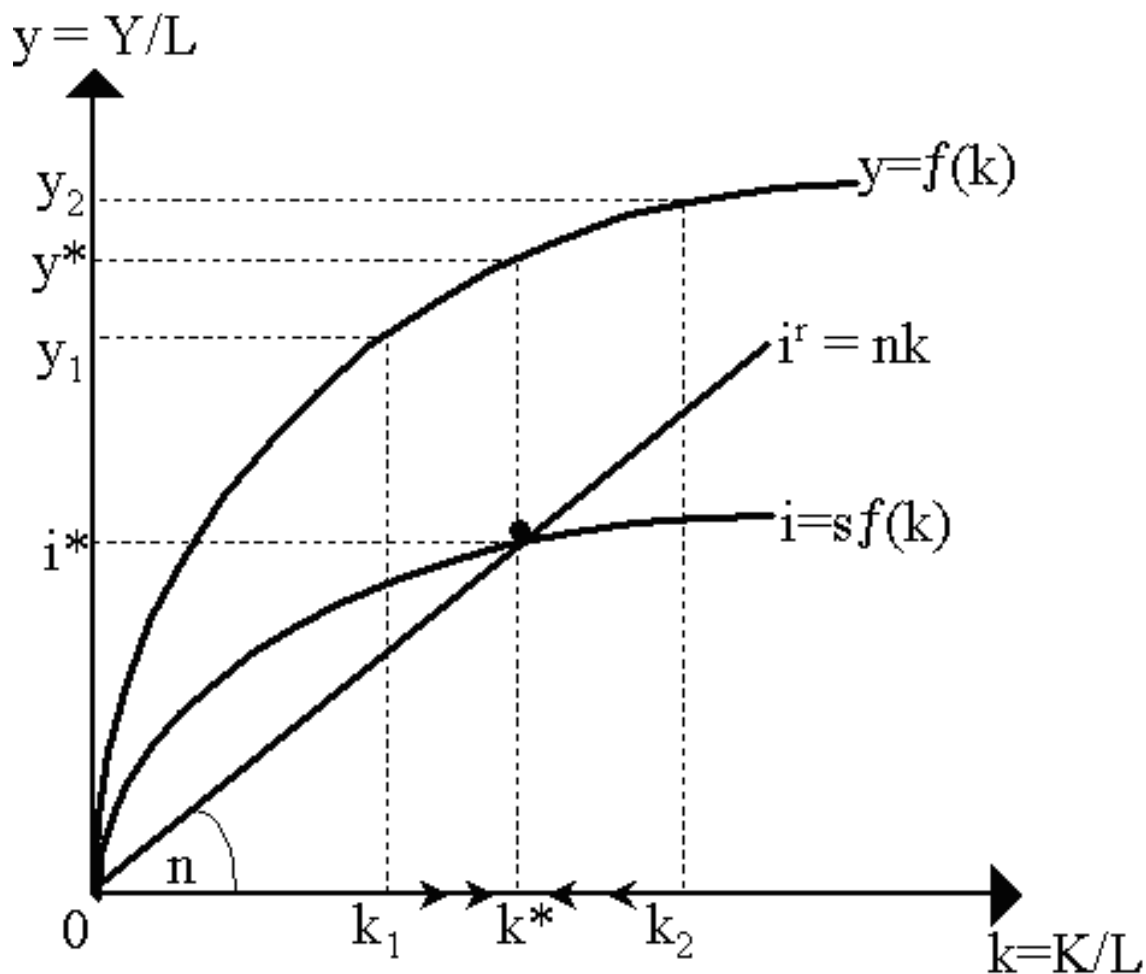


Figure 3.1:

The economy to get stable equilibrium growth path is one were:

- If the economy is on the equilibrium path it will stay, there
- If the economy is off the equilibrium path it will return to it

Along this convergence path, developing countries grow faster by the prediction of the Solow model. This is because developing countries are usually at the far left of the steady-state, for example, as shown in Figure.3.2. Foreign aid flows once received by the developing countries, it adds up to their existing capital stock. If aid flows are successful, higher capital strengthening would lead to higher economic growth in the

recipient countries. From the Figure 3.2, foreign aid added to the investment will shift a capital stock which will lead to an increase in total output in the economy. As the capital stock continues moving towards the steady-state the growth rate of output decreases due to diminishing returns to capital stock. However, with diminishing returns to the capital stock, the growth effect of foreign aid is only transitory unless. At the stage capital stock is very close to the steady-state has a detrimental effect on growth unless foreign aid brings positive change to the total factor productivity growth or human capital deepening, which has a permanent growth effect in the long run. On the other hand, from the right of the steady state the depreciation will be higher than investment, resulting in a negative growth rate of capital stock. The economy will return to the steady-state at the end as stable equilibrium is predicted by the Solow model. Figure.3.2 shows the graphical presentation of Aid and growth in the Solow model.

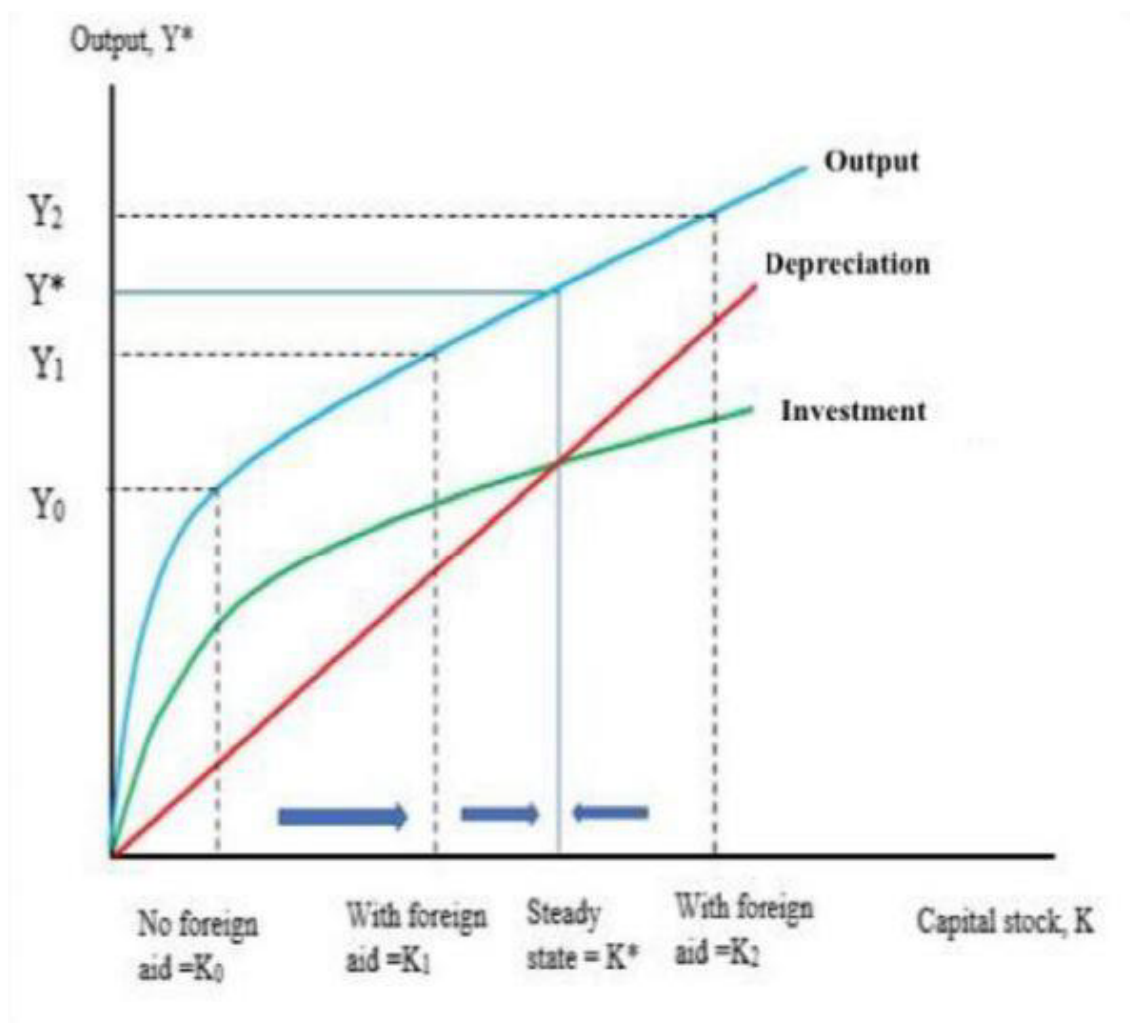


Figure 3.2:

The analysis can be done from the perspective of foreign aid because Aid can also result in permanent economic growth by facilitating technological progress. For example, Aid can boost gross savings that are needed to finance the investment required to arrive at an objective growth rate. Thus, foreign aid flows once received by a country add to its existing capital stock. With an increase in productivity, the curve of investment shifts up. Hence there will be new a steady-state at far right and more capital stock per unit of labor compared to the previous one. The total output will also shift upward thereby increase in economic growth. This effect depends on how much of the aid is invested in the sectors that can provide higher

productivity. Comparing Solow model to that of Harrod-Domar, the difference lies in factor substitutability. The Solow growth theory allows for perfect factor substitution and increasing returns to scale while the Harrod-Domar model assumes constant returns to scale on productivity. The implication is that the effect of the new growth models is that aid can lead to a long-run effect (Morrissey, 2001) [34]. Figure.3.3 shows the graphical presentation.

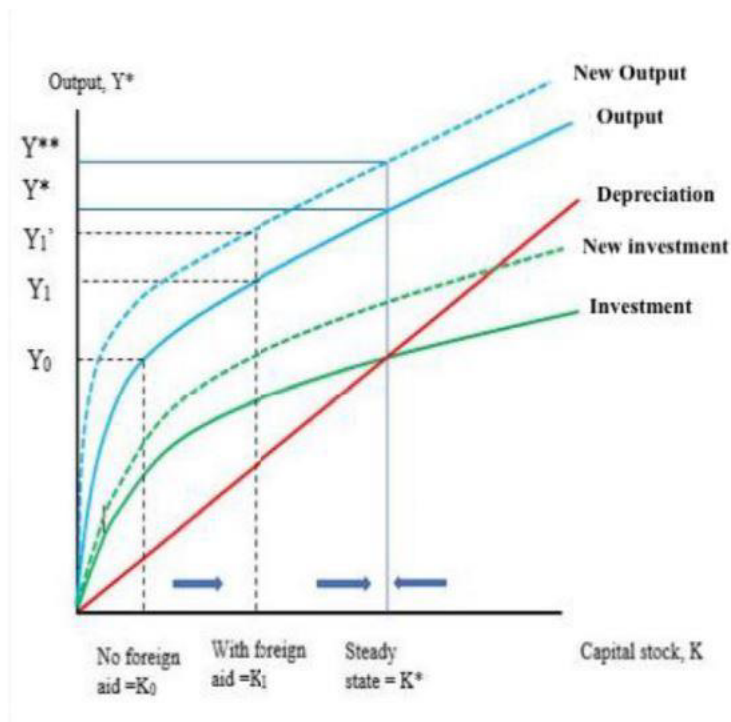


Figure 3.3:

However, the economic growth theory from the perspective of New Growth Theory incorporates the concept of endogenous technical change. The theory focuses on the transformation of inputs to outputs and augments standard growth accounting to emphasize the feedback from accumulated stocks of technological knowledge that fuels further economic growth (Romer, 1986) [41]. While human capital plays an important role in economic growth, the emphasis of new growth theory is also placed on technological change, especially spillovers, research and development, learning by doing, and externalities associated with an increase in knowledge. Since knowledge and human capital accumulates, increasing returns are possible in the economy. The analysis figured out from the model is that theory generates the potential for increas-

ing long-run per capita income growth rates. So, if foreign aid finances the imported goods in the economy and those imported goods are of a higher level of technology than domestic capital goods, then aid can increase the long-run growth rate.

3.3 Why should aid increases growth

From the inception of post-independence in Sub-Saharan Africa, the study of foreign aid in relation to economic growth has been researched by various macroeconomists. The finding of most studies finds that aid has a positive impact on growth, some outline certain conditions. Most of these earlier studies have been based on the two-gap model of Harrod-Domar. With insufficient saving rates to engine the required rate of domestic investment, Sub-Saharan African economies experience slow growth accompanied by a shortage of capital stock. With the view of aid increases investment by most studies, that is increasing the capital stock of developing economies as result accelerating economic growth. Investment is seen as an important element of growth at the starting point of economic development. This can be explained in the well-known equation of Harrod-Domar as presented equ. 3.7:

$$\frac{\Delta Y}{Y} = \frac{1}{k} \frac{\Delta K}{Y} \quad (3.7)$$

Notation of the variables:

- Y denotes the output
- $\frac{\Delta Y}{Y}$ denotes the economic growth rate
- K denotes the capita stock
- k denotes Incremental Capital Output Ratio. It shows the effect of an investment in a economy and consequence increase in the output.

Perse, a country's investment requirements necessary for any given growth rate is proportional to the level of growth rate by a constant known as the Incremental Capital Output Ratio. Foreign Aid is categorized as an increment to capital stock as captured in equation 3.8:

$$\Delta K = I = S + A + F \quad (3.8)$$

Where:

- I represent Investment

- S represent Domestic Saving
- A represent Aid
- F represent Net Private Foreign Capital inflows

Equation 3.8 tells us that foreign aid will increase investment as a result increase productivity in the economy. The analytical framework grounded in most of the traditional aid studies have been based on the Harrod-Domar growth model of the equation above. Where savings are needed to fund the investment required to attain a target growth rate, conditional on the productivity of capital. However, the results of such studies are not completely consensus because there is no rigid evidence that aid increases growth. Errors such as omitted variable bias and parameter inconsistency may affect the result of such studies. Easterly (1999) has provided a strong critique of gap models as a basis for a theory of growth, and specifically of their use by multilateral agencies to guide aid allocation as filling financing gaps.

3.4 Transmission Mechanisms

Developing countries lack sufficient domestic resources to maintain sustainable investment and the foreign exchange to import capital goods and technology to boost their economy. Generally, Foreign Aid to finance investment can directly fill the savings-investment gap and, at the same time can indirectly fill the foreign exchange gap. The extent to which official aid is issued to the government either through bilateral or multilateral can finance government spending which supports a small domestic tax base.

In analyzing the study on how aid works should address the interaction factors to economic growth. The analysis here focuses on the effect of aid on growth taking into account the transmission mechanisms of investment.

The study by Gomanee et al., 2005 [20] identifies investment as the most significant transmission mechanism through which aid should affect growth. The gap model pioneered by Chenery and Strout (1966) [12] is useful in identifying how aid may affect growth by figuring out specific constraints. According to Bacha (1990) [5] identifies three such constraints:

- the limit on investment due to low domestic savings
- the limited ability to import investment goods if export earnings are low
- the fiscal constraints on investment.

By relaxing on these constraints, aid can affect growth by means of increased investment. Developing countries face the challenging of inadequate national resources to support domestic investment and foreign exchange to import capital goods and technology. Foreign aid can fill the national saving-investment gap by financing investment. At the same time, aid can indirectly fill the foreign exchange gap. In addition, as the official aids are issued to the government, it can also fund government spending and compensate for a small domestic tax base.

Bacha (1990) [5] demonstrates that government fiscal conduct represents an important channel through which aid flows can influence growth. Recent literature also outlines the potential importance of government policy as a determinant of the effects of aid. Therefore, a proper approach to studying how aid works should cover a range of these interactions. The analysis in this regard focuses on the effect of aid on growth considering the transmission mechanisms of investment, trade and fiscal conduct of the government. Considering other factors remain constant, if aid funds investment, then aid contributes to economic growth. Low-income countries will need to import capital goods and intermediate inputs (in most cases fuel), but export earnings are often low and unstable. Aid can finance necessary imports, specifically investment goods, so this is a potential transmission mechanism. However, if aid is treated as fungible i.e. when aid is diverted to current expenditures or regular expenditures like salary and pension payments instead of investment in the economy its effectiveness could be reduced.

According to Gomanee et al, (2005) [20], the objective of aid is to finance investment. If aid is intended to finance spending on welfare and human capital formation, then its position will go to consumption spending and not impact on growth, at least not in the short term. This may support growth in the long run.

However, the point concerning whether aid is actually used to adjust investment has been answered in diverse ways. By Griffin (1970) [21] raised the spectre of fungibility in which foreign aid intended for investment is given to governments who may be inclined to ‘divert’ the aid to finance consumption expenditure. In this case, even if aid increases public savings and investment this may be balanced in the economy by reductions in private savings and investment. The conclusion is that aid should increase the total investment in the economy if not, it will not have the predicted impact on growth.

Chapter 4

Literature Review

There is a frequent tradition in development economics of collecting original data to test specific case studies. This research uses event studies and therefore, the review starts by comparing key event study of Foreign Aid. The key papers that analyze the effect of Foreign Aid on Economic Growth will be the focus of the latter parts of the review. Providing developing countries, particularly Sub-Saharan Africa with aid has been growing since the post-independence era in the 1960s which led to a flurry of research into the impact of Foreign on Economics Development. However, convergence of economic performance in terms of poverty reduction and economic development has become a major aspect in assessing the effectiveness of Foreign Aid.

Considering the available empirical studies, the relationship between foreign aid and economic growth has been comprehensively debated in the past. There are now several literature on the relationship between aid and growth. However, the econometric analysis of the studies does not provide a consistent picture on the impact of Foreign Aid on the economic well-being of the recipient country. Therefore, the analysis of the literature is categorized into three depending on the results of the study: first group of studies find out that there is positive link between Foreign Aid and economic growth, and second group find out there is no significant in Foreign Aid in relation to economic growth, and the third group according to which the effects of Foreign Aid are conditional on certain economic variables or policies. First, I will discuss the studies which support the view that aid contributes to the growth, then I will present some literature which is against this view or find conditional effects.

Among the first group of studies John Loxley, Harry A. Sackey (2008) [31] seeks to answer one main issue, namely, the effect of aid on income growth in Africa. In the process of doing that, other sub-issues such as aid-growth transitions for coun-

tries on the continent, aid's impact on investment, the exogeneity of aid and other sources of development finance are considered. Unlike other studies, they draw on a larger sample of African countries (i.e., 40 countries) and do so over a 28-year periods. They hypothesize that for Africa as a whole, aid has a positive impact on per capita income growth. The estimation uses pooled cross-section time series-data. Spanning 1973 through 2004, data for eight year averages is used. This approach is in line with current empirical studies revolving around foreign aid in particular and cross-sectional analysis in general.

In all the four models use in their analysis, the foreign aid variable is seen to have a positive impact of growth, and it is statistically significant. A percentage point increase in current aid leads to about 0.13 percentage point increase in growth. The coefficients for the aid-squared variables bear negative signs, which suggest some diminishing impact of aid on growth. However, this variable is not statistically significant in all the models. Additions to the stocks of physical and human capital exert a positive impact on growth in Africa. Inflation has a negative impact on growth. The paper also concludes that aids enhance economic growth through a transition mechanism for economic development e.g, investment. Furthermore Adusei, Elizabeth (2020) [2] examine the role of institutions in the aid-growth nexus Sub-Saharan Africa. The specific objectives of the study are: I. To evaluate the effect of foreign aid on growth in SSA. II. To estimate the impact of quality institutions on growth in SSA. III. To examine whether the institutions are necessary to promote aid effectiveness on economic growth in SSA. The Generalized Method of Moments was the estimator used in the study instead of pooled OLS method of estimation. That was as a result of pooled OLS method of estimation has been criticized in recent times in several studies over the problem of endogeneity associated with it. Since the study used dynamic model, the endogeneity problem arose from the use of lagged terms of the dependent variable, as such the use of system GMM as the estimation technique helped resolve the problem. The study showed a positive link between foreign aid and economic growth in the region. However, the study also observed that other factors including good fiscal policies, monetary policies, etc. need to be considered alongside institutional quality to mediate the effectiveness of aid on economic growth in the region and to increase the absorptive capacity of aid in the region.

Derek Headey 2008 [26] examine the Geopolitics and the effect of foreign aid on the economic growth of data for 1970–2001 show that aid has a significant but moderate average effect on growth over the period 1970–2001. In addition, the study also find out whether bilateral aid is less effective than multilateral aid, and if so, why? It turns out that multilateral flows appear to be about twice as effective as bilateral flows. In fact, the estimator suggests that the coefficient on bilateral aid

is not significantly different from zero. The result emphasises geopolitical biases as the principal reason for the inefficient allocation of bilateral aid. The author states that a promising explanation of why the estimated returns to aid are not larger is that bilateral aid had no significant effect on growth during the Cold War (pre-1990) but had a significant and sizable effect thereafter. In contrast, multilateral aid seems to have had sizable and significant effects throughout. The author claims that Foreign Aid is not successful in some of the previous studies due to either too weak methodology adopted in analysis, or to genuine aid efficiency losses.

A study by McGillivray (2005) [33] answers the question; Why aid now appears to work in promoting growth, after decades of little or no clarity in research circles over its effectiveness, is a matter of speculation. A widespread view as to why this is so is that donors, following the demise of the Cold War, are paying more attention to developmental criteria in the design and application of aid activities.

Moreover, Aid effective literature empirically demonstrates overwhelming evidence that aid increases growth and other poverty-relevant variables. The author stresses that by implication, it can be inferred that poverty would be higher in the absence of aid. While aid is positively associated with growth, there can be too much of a good thing, with aid being to be subject to diminishing returns. The study reviews the trends in official development assistance since 1960, highlighting a downturn in the 1990s. It asserts that poverty is higher and the Millennium Development Goals MDGs are harder to achieve as a result of this downturn. By econometrically examining the time series data from 1968 to 1999, the author concludes that the policy regimes of each country, such as inflation and trade openness, influence the amounts of aid received.

The pioneers of the Two-Gap model Chenery and Strout (1966) [12] Study outlines a theoretical framework designed to analyze the process of development with external assistance in quantitative terms. This framework is then used to evaluate the current performance of the developing countries and to assess their future needs for assistance under various assumptions. The study found a positive relationship between foreign aid and growth. They stated that an increase in investment is an engine of economic growth which increases output and per capita income. The required investment in the economy depends on the domestic savings, however if domestic savings are lower than the required investment then foreign assistance could be such as to equate fill that gap. Also, to increase the level of output capital goods should be imported, however, if the exports earnings are lower than the required imports then foreign aid comes into play to fill the import-export gap by founding import. They also argue that due to shortage of domestic resources, factors of production are also underutilized; however, a transfer of external resources enables the recipient to

raise the level of investment and to increase the supply of commodities that are not domestically produced. The lesson from their preceding analysis is that the focus of policy should vary according to the principal limitations to growth.

A study by Lauren Tait, Abu Siddique, and Ishita Chatterjee (2015) [45] empirically examines the impact of foreign aid in Sub-Saharan Africa using fixed effect panel data analysis data from 1970 to 2012 for a sample of twenty-five Sub-Saharan African countries is considered in the study. In addition, the impact of sector-disaggregated aid on growth over the sub-period from 1995 to 2012 was discussed in the research. This paper concludes that the effect of foreign aid on economic growth has a significant positive, statistically significant, and long-term impact on per capita GDP growth over the period under consideration. Also, aid in the form of grants is found to be more effective than loans. The finding of the authors further states that the significant positive effect of aid is not subject to diminishing marginal returns, nor is it conditional on the level of freedom in the country. In addition, upon sectoral decomposition of aid commitments, certain sectors are identified as having a more significant impact on growth over the sub-period from 1995 to 2012. Aid allocated for social infrastructure, in particular education and health, and general budget support has a positive, significant impact on growth. One of the limitations of their study was the shorter time frame. The shorter time frame has resulted in increased serial correlation, which may bias the results.

Mark Bruckner (2013) [9] shows that foreign aid has a significantly positive average effect on real per capita GDP growth only if the quantitatively large negative reverse causal effect of per capita GDP growth on foreign aid is adjusted for in the growth regression. He indicates that the reason for no statistical significance arises because of not including the negative reverse causal effect of per capita GDP growth on foreign aid in the growth regression. The results of the author is categorized into two based on the two-step estimates method, the first being the Instrumental variables estimates of the effect of economic growth on foreign aid, shows instrumental variables estimate yield that a 1 percentage point increase in GDP per capita growth results in reduction in foreign aid by over 4 percent. and the second, Instrumental variables estimates of the effect that foreign aid has on economic growth shows that there is positive and significantly different from zero at over 99 percent confidence when the negative reverse causal effect of GDP per capita growth on foreign aid is adjusted for. However, the negative reverse causal effect of economic growth on foreign aid based on the comparison of two estimated methods has a positive effect in which a 1 percent increase in foreign aid increased real per capita GDP growth by around 0.2 percent. The study also indicates that multilateral aid has typically been more effective than bilateral aid in promoting growth. The reason why bilateral

aid's ineffectiveness over the last 3 decades is an apparent Cold War effect.

Georgios Karras (2006) [30] empirically investigates the relationship between foreign aid and growth in per capita GDP using annual data from the 1960 to 1997 period for a sample of 71 aid-receiving developing economies. Contrary to their study with the overwhelming majority of the empirical literature, which consists of cross-sectional studies, the time dimension of the data was fully utilized. The results show that the effect is positive, and robust across these two measures of foreign aid: aid per capita and aid as a fraction of GDP. On average, the empirical findings support the conclusion that a permanent increase in foreign aid by \$ 20 per person of the receiving country results in a permanent increase in the growth rate of real GDP per capita by approximately 0.16 percent, while a permanent increase in aid by 1 percent of the receiving economy's GDP permanently raises the per capita growth rate by approximately 0.14 to 0.26 percent. The findings did not put into consideration the effects of policies.

Karuna Gomanee, Sourafel Girma, and Oliver Morrissey (2005) [20] analyze the relationship between foreign aid and economic growth. They identify investment as the most significant transmission mechanism and consider effects through financing imports and government consumption spending as direct mechanisms via which aid should affect growth. However, they do not pursue the transmission mechanism through government policy in their study. First, the conventional view, at least in the context of cross-country growth regressions, is that it is difficult to establish that aid affects policy. Second, the authors incorporate government policy as a control variable rather than include an aid policy term. Moreover, the tendency for sub-Saharan Africa to be subjected to political and economic instability was not incorporated in their research.

The authors measure the total effect of aid on growth, accounting for the effect via investment with the use of econometrics residual generated regressors. Their finding of pooled panel results for a sample of 25 Sub-Saharan African countries over the period 1970 to 1997 point to a significant positive effect of foreign aid on growth, *ceteris paribus*. The relationship on an average basis indicates that each one percentage point increase in the aid/GNP ratio contributes one-quarter of one percentage point to the growth rate. They report that Africa's poor growth record should not therefore, be attributed to aid ineffectiveness.

Nihar Ranjan Jena and Narayan Sethi (2020) [29] employ a wide array of econometric tools to carry out an empirical analysis. Various panel unit root test is carried out, both with the assumption of common unit root and individual unit-roots. They empirically examine the effectiveness of foreign aid in improving economic growth prospects in the South Asian region from 1996 to 2017. Also, look at causality

among the variables. A sample of eight South Asian countries are being considered for this study and this study uses various econometrics tools such as Pedroni and Johansen–Fisher panel cointegration test, panel fully modified ordinary least square, and panel dynamic ordinary least square (PDOLS) to ascertain the long-run and short-run dynamics among the variables under consideration. Their empirical results found that long-run, as well as short-run relationships, exist among foreign aid, economic growth, investment, financial deepening, price stability, and trade openness of the South Asian economies. The authors also found unidirectional causality running from foreign aid to economic growth. Both the long-run relationship as well as short-run causality between foreign aid and economic growth is unequivocally positive. In addition, they believe that financial sector development by ensuring better utilization of capital resources positively impacts economic growth.

Sophannak Chorn and Darith Siek (2017) [13] examine the impact of foreign capital inflows which mainly consist of foreign direct investment (FDI) and official development aid (ODA) on the economic growth of developing countries. Using a sample of 77 developing countries from all regions classified by the World Bank from 1997 to 2012. The authors conduct an econometrics analysis of ordinary Least Square (OLS) with time and entity fixed effects has been chosen as a method of running the regression, and robust function in order to control the heteroscedasticity. The results find that both FDI and ODA have positive and significant impacts on economic growth. However, FDI is more robust and statistically significant.

Edmore Mahembe and Prof Nicholas M. Odhiambo (2019) [32] review empirical studies on the impact and effectiveness of official development assistance, or foreign aid on poverty reduction. The paper reviews major findings from the research studies on the direct effects of foreign aid on poverty. The authors divided the reviewed empirical literature into two broad groups: the studies which used non-monetary measures of poverty and those that used monetary measures of poverty. The survey results show that foreign aid has a positive impact on poverty. In the regressions, they control for openness (trade) and population growth in the baseline and for democracy and public investment in the Two-Stage Least Squares (2SLS). First, the baseline regressions were used to assess the strength of the instruments. Second, democracy (Asongu 2012a, 2178) and public investment (Asongu 2014a) have also been found to positively affect institutions for the same period and a sample of African countries.

The study by Fielding, McGillivray, and Torres (2006) [19] differ in methodology from existing work on aid effectiveness in several ways. Most importantly, it does not use GDP as a development indicator. No reference is made to per capita income. Instead, the model employs a measure of the material assets that the household possesses, using data on material assets in forty-eight countries in the World

Bank Health, Nutrition and Poverty (HNP) database. They discuss the results of research into the impact of foreign aid on human development. Rather than focusing on per capita income, the authors look at how aid impacts a range of human development indicators, including measures of health, education and fertility, and allow for the fact that these different dimensions of well-being are likely to interact with each other. Their results summarized show a straightforwardly positive effect of aid on development outcomes. This contrasts with literature in which there are mixed results about the impact of aid on per capita GDP. The author's analysis finds that one reason for this contrast may be that the results above focus on the impact of aid on human development, and how aid might promote investment in human capital.

Among the Second group of studies: Voivodas (1973) [49] found that for a sample of 22 least developed countries from 1956-1968 aid has a negative impact on economic growth. These results, however, might not be accurate due to the poor quality of his data and the limited econometric technique available at the time.

Griffin and Enos (1970) [22] found the negative relationship between economic growth and foreign aid. They criticized the typical growth model assumptions that investment increases by the same amount of foreign inflows which leads to higher rate of capital accumulation in the economy. In addition, the notion that recipient country unable to increase aid merely to increase consumption and have no incentive to increase aid by reducing savings was criticized. They argued that foreign inflows supplant rather supplement domestic savings. Moreover, foreign aid does give incentive to government and private entrepreneurs not to limit their own consumption and government will also refrain from raising taxes. In other words, foreign aid has neither accelerated growth nor helped to foster democratic political regimes in recipient countries. If anything, aid may have retarded development by leading to reducing domestic savings, by distorting the composition of investment and thereby raising the capital-output ratio, by frustrating the emergence of an indigenous entrepreneurial class, and by preventing the institutional changes. However, their study faced challenges on limitation to the availability of data.

(Peter Boone, 1994) [8] investigates aid effectiveness based on an analytical framework that relates aid effectiveness to political regimes. His study finds that aid has a positive effect on the size of government but does not significantly increase investment, nor benefit the poor as measured by improvements in human development indicators. The impact of aid does not vary according to whether recipient governments are liberal democratic or highly repressive. However, liberal political regimes and democracies, have on average 30 percent lower infant mortality to that of least free regimes. In summary, Boone study found that aid does not have any positive

impact in any factor that promotes economic growth.

Singh (1985) [42] criticized earlier studies that they ignored the composition and direction of recipient government economic policies in their analysis which he called intervention policies. He views that when the state intervention policy variables were not included in the model of the study, foreign aid and domestic savings showed positive and statistically strong relationship with economic growth. However, when intervention policy variables were incorporated in the model, then the estimated coefficients of foreign aid and saving turned to be negative. In addition, he stated that different rate of growth in recipient countries demonstrates that foreign aid may not help a country to obtain and sustain the high rate of economic growth unless others factors conducive to growth are also in place.

Additionally, Simplice A. Asongu and Jacinta C. Nwachukwu (2015) [3] investigates the effect of foreign aid on governance to extend the debate on foreign aid and to verify common positions from Moyo's 'Dead Aid', Collier's 'Bottom Billion' and Eubank's 'Somaliland'. The empirical evidence is based on updated data from 52 African countries for the period 1996–2010. An endogeneity robust instrumental variable Two-Stage-Least Squares empirical strategy is employed. Their findings reveal that development assistance deteriorates economic (regulation quality and government effectiveness) and institutional (corruption-control and rule of law) governance but has an insignificant effect on political (political stability, voice and accountability) governance. While these findings are broadly in accordance with Moyo and Collier on weak governance, they neither confirm the Eubank position on political governance nor the Asongu stance on the aid-corruption nexus in a debate with Okada and Samreth. to summarize the analysis Aid has a negative relationship with government quality dynamics.

Vasquez (1998) [48] similar conclusion to that of Peter Boone. Using a sample of 73 countries from 1971 to 1995, he examined the effect of both bilateral aid and multilateral aid and found out Neither aid per capita nor aid as a percentage of GDP was positively correlated with economic growth. His results further stated that aid as a percentage of GDP has a slightly negative correlation with economic growth. The study indicates that economic growth factors are in no way triggered by an increase in foreign aid.

Paul Mosley, John Hudson, and Sara Horrell (1992) [36] reexamine the correct structural form for the relationship between aid, other financial flows, and economic growth rates using a cross-section approach and – for the first time – data for the entire 1980s as well as the 1960s and 1970s. For the 1980s the aggregate partial regression coefficient of aid on growth emerged, for the first time, as positive and (just) significant, although this result does not survive the partitioning of the sample into

sub-groups. It remains obvious that the effect of aid on growth is country-specific, and in the later part of the paper the authors test a new approach under which aid effectiveness passes through a cycle, first increasing and then diminishing as a country's stage of economic development alters. If this approach is accepted (and the initial results, with an informal test, are promising) the overall cross-section relationship between aid and growth, abstracting from other influences, will be neutral in most periods. Then the result concludes that Aid increases unproductive public consumption and fails to promote growth.

Reichel (1995) [40] tackles the simultaneity concern by specifying a model with three endogenous variables: aid, domestic saving, and growth. The aid model equation has GDP (country size) and the level of per capita income among its independent variables. His results from two-stage-least-squares estimation based on period average data over the 1980s for 83 developing countries showed that aid had no statistically significant effect on growth i.e no positive link with economic growth. Addition to that, he also points out that aid fails to promote savings owing to the substitution effect.

Third studies find conditional results on assessing the foreign aid. William Easterly (2007) [17], in his research on Foreign Aid, opines that foreign aid cannot accomplish economic development on its own. Easterly stressed out that Aid should be well defined and set more modest goals, like addressing some of the people some of the time, rather than trying to be the catalyst for society-wide transformation.

Stephen Howes (2011) [27] paper provides an overview of issues relating to aid effectiveness, determinants, and strategies. He argues that it is impossible to give a definitive answer to the question of whether aid is effective, and that it is more useful to ask what can be done to make aid more effective. The paper then groups the various determinants of aid effectiveness, as well as strategies to improve effectiveness, under three headings: the performance of the developing country government; the performance of the aid agency of the donor country; and the interaction between the two. This provides a useful framework within which to understand different and competing arguments about how to improve aid effectiveness.

David Roland-Holst and Finn Tarp (2004) [46] examine evolution and discuss how the effectiveness of aid has been based on new Perspectives. From an historical perspective, the authors discuss how the relative importance of aid has changed with the rapid growth of trade and private capital markets. Looking ahead, they argue that great care should be taken when applying macro performance evaluation to development assistance. This approach increases the risk that aid will be politicized and allocated inefficiently. Rationing credit in whatever form it takes by

macro-criteria inevitably screens out credit- or need-worthy recipients, while many beneficiaries in attractive macro settings may be less deserving. Simplistic macro rules-of-thumb not only compromise more rigorous credit and need standards; they reinforce the adversity of people living under substandard governance. In reality, aid and lending relationships involve complex contractual and agency relationships that are essentially microeconomics in nature. Therefore, the authors show how conceptual innovations in modern economic theory might be enlisted to improve aid effectiveness, also review some implications for public donor institutions of another globalization phenomenon, rapidly emergent private policy agencies in the form of NGOs.

The study by Guillaumont and Chauvet (2001) [11] compare two visions of aid effectiveness and allocation. The first argues that aid is only effective if domestic policies are appropriate. The second, in contrast, argues that aid effectiveness depends on the external and climatic environment: the worse this environment, or the more vulnerable the recipient countries, the greater the effectiveness of aid. Aid effectiveness is conditional on environmental factors. The use of Cross-sectional econometric tests related to GDP growth on two 12-year pooled periods clearly favor the second view. The two views can be reconciled through the principle of performance-based aid allocation, where performance is defined as outcomes adjusted for the impact of environmental factors. The authors outline that performance can then be measured in several manners which are subject to comparison. One approach would lead one to allocate more aid the worse the (external) environment is (for a given policy) and the better the policy is (for a given environment).

Sikiru Babalola and Waliu Shittu (2020) [4] examines the roles of institutions on the relationship between foreign aid and economic growth in the 16 West African countries. With the use of panel data, they employ the autoregressive distributed lag technique in investigating the relationship. Their findings depict that foreign aid exerts a neutral effect on economic growth; the effect turns negative when they incorporate institutional into the analysis. Again, the interaction effect of foreign aid and institutions on economic growth is such that it reduces the negative effect of foreign aid on economic growth. The authors used other factors of growth such as trade openness and government size, whose effects are positive and largely negative on the growth of the West African region, respectively. The outline of their research indicated that significant policy implication from these findings is that the efforts of governments of the region should be directed towards building formidable economic, social and political institutions. This would not only reduce the negative impact of aid on growth but would also promote the competitiveness of the countries for private domestic and foreign capital; thus, reducing reliance on foreign aid.

Another conditional result of the literature on aid is the one given by Collier and Dollar (2002) [14]. The authors derive a poverty-efficient allocation of aid and compare it with actual aid allocations. They add a mapping from growth to poverty reduction and compare the effects of using headcount and poverty-gap measures of poverty. They find the actual allocation of aid to be radically different from the poverty-efficient allocation. In the efficient allocation aid always tapers in with policy reform. The authors conclude that the ultimate allocation of foreign aid is highly sensitive to the quality of policies in the recipient countries.

Last but not least, Burnside and David Dollar (2000) [10] used new database of foreign aid and Neo-Classical theory as analytical framework for the study. Their research on foreign aid effectiveness has cited that Aid can be effective when policies and economic management are good. Policy effectiveness dictates medium of aid on economic growth. Their study found that aid has a positive impact on growth in developing countries with good fiscal, monetary, and trade policies but has little effect in the presence of poor policies. Good policies are ones that are themselves important for growth [45]. The quality of policy has only a small impact on the allocation of aid. Their results suggest that aid would be more effective if it were more systematically conditioned on good policy. They suggested that donors should consider the policy environment of the recipient country for aid.

Considering the extensive literature on Foreign Aid assessment in relation to economic growth, the results are not unanimous depending on the models for estimation, statistical methodologies, and observations such as preference sample period and geographical location. With the available literature on foreign aids, the different methodological approaches that have been adopted in analyzing aid effectiveness, according to Hansen and Tarp (2000) [25] summarize these methodological approaches are First, the impact of aid at both the microeconomic and the macroeconomic level focusing on the relationship between aid, economic growth, savings, investment. Second, the sample cross-country case studies. Finally, using econometric techniques of both qualitative and inter-disciplinary as well as quantitative. These analyses do not provide a consistent picture on the effect of Aid on growth. For this, I categorized the empirical analysis into three components based on their results. Their analysis also identifies three categories of models used in the aid evaluation literature. The first was Harrod–Domar or two-gap models focusing on the relationship between aid and savings. The second, using a Solow approach, concentrated on the relationship between aid, investment, and economic growth, while the third group, characterized by new growth theory, build institutional and policy variables directly into the regression equations in addition to more traditional macroeconomic variables into the assessment.

The dimension of foreign aid on the literature review varies, a survey relating to the history, volume, composition and allocation of foreign aid has concluded that historically, aid has served a multitude of objectives. For some donors, aid is used as a commercial policy tool, whereas some others use aid for the development purpose for the recipient countries.

Observing from the reviewed literature of different time spaces, the study of Foreign Aid has been quite interesting with regard to Africa particularly Sub-Saharan Africa. With regard to the research structure however, there was a major gap observed in the course of the literature review with respect to the scope of such studies. The sub-Saharan region comprises 46 countries listed by the United Nations Development Programme. The studies I have come across so far none has included all the countries (Sub-Saharan Africa) or the majority of the countries in the region. Also another important limitations of much of this literature is the incompleteness of the underlying growth models integrate in the study. As such many studies models' economic growth as a function of capital accumulation only, also just few have addressed model specification much detail. Mosley (1987) [35] did introduce variables capturing the role played by government and trade, whereas the macroeconomic policy was first incorporate into the model by Burnside and Dollar (2000) [10].

In contrast, I limit the analysis to a sample of SSA countries only, and I have accounted for the 46 SSA countries in this research. Moreover, the proposed study takes into analysis of the latest available data up to 2020 which is expected to provide updated insights into the efficacy of foreign aid on economic growth in the SSA region. I run new growth theory to build multiple econometrics regression to analyze the effect if the studies.

In this study, my main objective will be to ascertain the nature of the relationship between Foreign Aid and economic growth, and the relation between some independent variables and Aid by using appropriate regression techniques.

Chapter 5

Methodology

5.1 Data Source and Variables

The sample data of this study contains 46 Sub-Saharan African countries from 2000 to 2020. Panel data has been used on the selected countries under the specified time. The sample of the countries is motivated considering the fact they have most data available needed in the analysis. In this study real GDP per capita is used as an indicator of the initial level of economic development for the period of 2000 to 2020. For the details on the countries included in the sample are provided in Appendix [A.1](#).

The dependent variable used in analyzing the economic performance in this study is per capita GDP growth. Per capita GDP is the variable that is affected by all the independent variables. As a crucial variable in any economic growth equation, initial per capita GDP is particularly important in the situation of considering a sample of developing countries, since it is likely that countries at different levels of economic development have different capacities to utilize the available resources in order to affect the economy (Gyimah-Brempong, 1992) [[23](#)].

Table [5.1](#) presents the sources of the dataset used in the regression analysis. All the necessary data, to run regression model analysis and the data used at the preliminary stage (i.e, in the background chapter) have been collected from the World Bank [website](#), World Development Indicators (WDI) update date by World Bank December 2021, also International Financial Statistics (IFS) of International Monetary Fund (IMF), Organization for Economic Cooperation and Development (OECD). The detailed summaries of variables (independent and dependent), their sources, and their corresponding scale are represented in the following Table [5.1](#).

Economic Variables	Symbols	Scale	Data source
Dependent variable			
Economic growth	SSAGDP	GDP per capita (constant price in \$)	WDI and OECD data files.
Explanatory Variables			
Foreign aid	ODA	Net ODA received per capita (current US\$)	WDI and OECD data files.
Inflation rate	INF	Inflation, GDP deflator (annual %)	WDI and OECD data files.
Savings	GS	Gross savings (% of GDP)	WDI and OECD data files.
Investment Rate	IR	Gross capital formation (% of GDP)	WDI and OECD data files.
Trade	TR	Trade (% OF GDP)	WDI and OECD data files.
Financial Development	FD	Domestic credit to the private sector by banks (% of GDP)	IMF, IFS and data files, and WDI and OECD GDP estimates.
Region	i	46 countries of Sub-Saharan Africa	
Year	t	From 2000 to 2029	

Table 5.1:

Macroeconomic Stability is captured in the regression model by the use of the GDP deflator as one of the explanatory variables. The growth assessment has a crucial link with the financial market based on that, I factor out the interaction between financial sector developments on economic growth with that I used domestic credit to the private sector as a percentage of GDP as one of the explanatory variables.

To avoid variables varying over the cross-sectional units, inefficient estimates, and biased standard errors, I test for heterogeneity and serial correlation in the error terms in fixed effects regression model.

The measure of foreign aid is captured as Net official development assistance (ODA) per capita consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients [28] -according to world Bank. The aid data does not distinguish between bilateral aid and multilateral aid. Below, I describe the relationship between the independent and dependent variables.

First, the relationship between GDP growth per capita and trade. GDP increases in the economy when there is a trade surplus: i.e., the total value of goods and services that domestic producers produce and sell abroad exceeds the total value of foreign goods and services that domestic consumers buy from others. So, the Trade openness of developing countries helps increase economic growth using comparative Advantage. This result is confirmed by Burnside and Dollar (2000) [10]. International trade increases the productivity in the economy thereby giving more opportunities to the people such as jobs.

Moreover, Economic growth is observed to have a negative relationship with the annual inflation this evidence is supported by (Fisher, 1993), Fishlow (1989), etc.[39] Inflation distorts incentives to invest and labor supply hence reducing productivity growth, thus high inflation will reduce economic growth. Additional, Inflation tends to cause macroeconomic instability, the uncertainty in the business environment especially when the rate of fluctuation highly hinder investment in the economy.

Economic growth is represented by GDP per capita is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products [50]. It is the total market value of all final goods and services produced within the country in a one given year.

Gross capital formation (formerly gross domestic investment) consists of expenditures on additions to the fixed assets of the economy plus net changes in the level of inventories. Inflation as a percentage change of price is measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the econ-

omy. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency [28].

Gross savings are estimated as gross national income minus total consumption, plus net transfers. Domestic credit to the private sector by banks refers as financial resources given to the private sector by depository corporations (deposit taking corporations except central banks), such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises. Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product in the economy [28].

Summary Statistics, using the observations 1:01–46:21
(missing values were skipped)

Variable	Mean	Median	S.D.	Min	Max
SSAGDP	1873.0	852.9	2712.	112.9	22943.
ODA	66.3	50.3	67.5	−12.0	664.
INF	13.0	5.45	91.4	−26.7	2630.
GS	18.4	16.7	11.9	−19.9	57.9
IR	22.7	21.5	10.1	0.000	79.4
TR	67.5	59.5	30.7	0.785	176.
FD	17.8	12.8	16.9	0.000	106.

5.2 Models for Estimation

The specific objective of the empirical analysis in this thesis study is to determine the effect of foreign aid on the economic growth of Sub-Saharan Africa. An econometric tool of fixed-effect models has been chosen as a method of running the regression. The estimation uses stacked time-series panel data for a cross-section of forty-six SSA countries. One advantage of using this approach of regression is that it enables one to control all variables that vary over the cross-sectional units but are constant over time. The approach is in line with current empirical studies revolving around foreign aid and economic growth. The panel data in this regression model has several benefits as indicated by Baltagi (2001) [6]. These include its property to control for heterogeneity of cross-section units such as states, countries, firms, etc., over time. Failure to account for the heterogeneity would bias the results, regardless of the sample size. Panel data analysis helps us to get unbiased estimation when handled properly. Comparing panel data to that that of pure cross-section and time-series data, panel data estimation is far better to identify and measure the effects

of independent variables on the dependent variables in the regression. panel data contains (in most cases) more informative data, more variability, less collinearity among the variables, more degrees of freedom, and better efficiency. The importance of the use of country effects to account for individual country heterogeneity has been recognized throughout the literature as the one by (Hansen and Tarp, 2001) [24]. Nevertheless, the countries in the sample share several attributes in terms of their geographical location (i.e Sub-Saharan African countries) and others such as colonial history, political regime, and religious affiliations. These characteristics are country-specific and cannot be accounted for in the regression model.

In this study, the variables are considered on the basis of their real values. The objective of the dissertation is to examine the relationship between foreign aid and economic growth. Also, their relationship with the other relevant macroeconomic variables such as Inflation rate, Savings, Investment Rate, Trade, and Financial Development. the functional relationship between the independent variables and the dependent variables are given in Equation 5.1.

$$SSAGDP = f(ODA, INF, GS, IR, TR, FD) \quad (5.1)$$

The growth model is estimated as follows:

$$SSAGDP_{it} = \alpha_{it} + \beta_{1i}ODA + \beta_{2i}INF + \beta_{3i}GS + \beta_{4i}IR + \beta_{5i}TR + \beta_{6i}FD + \varepsilon_{ti} \quad (5.2)$$

In this model, $i = 1, 2, \dots, N$ represents selected sub-Saharan African economies in the panel, $t = 1, 2, \dots, T$ shows the time. α_i is the constant term in regression analysis, and it represents the intercept of the regression. The parameters $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ represent the coefficients of ODA as a percentage of GDP, price stability (INF) measured by the GDP deflator is used to capture the impact of the external and internal macroeconomic instability, Gross savings (GS) measures as the percentage of GDP, gross capital formation or gross investment (IR) as a percentage of GDP, trade as a percentage of GDP, financial development (FD) measured as domestic credit to the private sector by banks. In other words, Betas measure the volatility of a SSAGDP relative to the independent variables . ε_{ti} is the error term or random disturbance. ε_{ti} are assumed $E(\varepsilon_i) = 0$. The estimation of equation 5.2 with a cross-section of countries explicitly assume that each country's disturbance is purely random and uncorrelated with the foreign aid, inflation rate, savings, investment rate, trade, and financial Development. That is, errors for a given entity are uncorrelated over time that is, $cov(\varepsilon_{ti}, \varepsilon_{ts}) = 0$ for $t \neq s$.

In equation 5.2, I assess the impact of foreign aid on economic growth for the selected Sub-Saharan African. Accordingly, GDP per capita has been taken as the dependent variable. And, it regressed on a series of independent variables. The right hand of the equation represents the explanatory variables for the selected countries, which represent foreign aid and others. The selection of independent variables included in the model is based on the fact that it finds that these six independent variables can affect the GDP growth per capita. These are crucial macroeconomic variables in most economic growth equations. Since the focus of the study is to examine the effects of foreign aid on economic growth, so the main focus will be the coefficient of ODA.

By constructing an empirical model and various tests, I want to establish the stability of the relationship between Economic Growth and Foreign Aid either positive or negative. Moreover, I also wanted to observe the change in the magnitude of the coefficient of ODA when we incorporate other variables into the model.

Chapter 6

Empirical Results and Analysis

Here, we present the results and the analysis of the study. The research explores some econometric tools to carry out an empirical analysis. We first run a Fixed effects model for panel data of forty-six Sub-Saharan Africa to determine the effects of the variables under consideration. The two main variables in the regression are foreign aid and economic growth. Before presenting the result of the empirical model, it is necessary to discuss the problem of multicollinearity. Multicollinearity implies that independent variables in the model are correlated with each other. Moreover, high correlation among explanatory variables may lead estimates to become very sensitive to changes in model specification, high standard errors, and unexpected signs or magnitude of coefficients.

From the results of the analysis, as reported in table 3, it shows that foreign aid has a positive impact on the economic growth of Sub-Saharan Africa. It is simple to determine that the coefficient on the aid and domestic credit to the private sector by banks variable is positive and significant from a multivariate regression of influences on the particular dependent variable. While gross saving is positive but not significant. The regression result shows the percentage change in the GDP per capita that the independent variables explain collectively. R-squared measures the strength of the relationship between the model and the dependent variable.

To avoid spurious regression, the panel unit root test must be carried out first in order to identify the stationarity properties of the relevant variables. That is to identify that series are stationary or non-stationary. In addition, it is necessary for the variable to be stationary. However, the presence of non-stationary variables leads to spurious regression. There are a variety of panel unit root tests that exist in the literature.

The detailed quantitative analysis is presented in the estimated regression model

below and in table 3.

$$\begin{aligned} \widehat{\text{SSAGDP}} = & 913.111 + 2.45842 \text{ ODA} - 1.34908 \text{ INF} + 4.70263 \text{ GS} \\ & \quad (212.03) \quad (0.80424) \quad (1.1496) \quad (5.0392) \\ & - 1.25132 \text{ IR} - 12.2765 \text{ TR} + 85.6357 \text{ FD} \\ & \quad (5.4548) \quad (2.3473) \quad (5.9056) \\ T = 627 \quad \bar{R}^2 = 0.3451 \quad F(43, 583) = 124.34 \quad \hat{\sigma} = 715.91 \\ & \quad \text{(standard errors in parentheses)} \end{aligned}$$

Model 3: Fixed-effects, using 627 observations
 Included 38 cross-sectional units
 Time-series length: minimum 1, maximum 20
 Dependent variable: SSAGDP

	Coefficient	Std. Error	<i>t</i> -ratio	p-value
const	913.111	212.026	4.307	0.0000
ODA	2.45842	0.804243	3.057	0.0023
INF	-1.34908	1.14963	-1.173	0.2411
GS	4.70263	5.03915	0.9332	0.3511
IR	-1.25132	5.45485	-0.2294	0.8186
TR	-12.2765	2.34727	-5.230	0.0000
FD	85.6357	5.90559	14.50	0.0000
Mean dependent var	1940.569	S.D. dependent var	2203.355	
Sum squared resid	2.99e+08	S.E. of regression	715.9104	
LSDV R^2	0.901680	Within R^2	0.345088	
$F(43, 583)$	124.3397	P-value(F)	1.7e-263	
Log-likelihood	-4988.483	Akaike criterion	10064.97	
Schwarz criterion	10260.37	Hannan-Quinn	10140.88	
$\hat{\rho}$	0.773907	Durbin-Watson	0.389444	

Joint test on named regressors –

Test statistic: $F(6, 583) = 51.1993$

with p-value = $P(F(6, 583) > 51.1993) = 1.35383e-050$

Test for differing group intercepts –

Null hypothesis: The groups have a common intercept
 Test statistic: $F(37, 583) = 45.7893$
 with p-value = $P(F(37, 583) > 45.7893) = 2.90322e-147$

Distribution free Wald test for heteroskedasticity –
 Null hypothesis: the units have a common error variance
 Asymptotic test statistic: $\chi^2(37) = 6.24708e+030$
 with p-value = 0

Wooldridge test for autocorrelation in panel data –
 Null hypothesis: No first-order autocorrelation ($\rho = -0.5$)
 Test statistic: $F(1, 35) = 28.5984$
 with p-value = $P(F(1, 35) > 28.5984) = 5.59562e-006$

Test for normality of residual –
 Null hypothesis: error is normally distributed
 Test statistic: $\chi^2(2) = 509.445$
 with p-value = $2.37363e-111$

In the results presented in the table 3. show the correlation coefficient matrix among variables. The observation entails that the main variable of interest, that is per capita GDP and foreign aid are positively correlated. This is in line with the result of the fixed-effect model regression in above. This further shows the regression coefficient of per capita GDP and foreign aid is also statistically significant. Other explanatory variables positively correlated with GDP per capita except for the measure of price change which is inflation, one percent change in inflation is expected to decrease GDP per capita to 7.6 percent.

Table 3: Correlation coefficients, using the observations 1:04–46:20
 (missing values were skipped)
 5% critical value (two-tailed) = 0.0632 for n = 962

SSAGDP	ODA	INF	GS	IR	TR	FD	
1.0000	0.0758	-0.0762	0.3874	0.0984	0.3683	0.6760	SSAGDP
	1.0000	-0.0668	0.0989	0.2265	0.2063	0.2527	ODA
		1.0000	0.0525	-0.0190	0.0652	-0.1300	INF
			1.0000	0.5517	0.3267	0.0920	GS
				1.0000	0.3348	0.0904	IR
					1.0000	0.2982	TR
						1.0000	FD

Table 4 shows the summary statistics of all the variables considered for this empirical study. For the descriptive statistics, the dependent variable SSAGDP varies normally from 111.93 to 22943, having a mean value of 1873.0, standard deviation of 2712.4, and skewness of 3.5585.

Table 4: Summary Statistics, using the observations 1:01–46:21
(missing values were skipped)

Variable	Mean	Median	Minimum	Maximum
SSAGDP	1873.0	851.93	111.93	22943.
ODA	66.333	50.313	−11.967	663.72
INF	13.005	5.4546	−26.700	2630.1
GS	18.422	16.662	−19.903	57.850
IR	22.654	21.496	0.00000	79.401
TR	67.480	59.455	0.78463	175.80
FD	17.797	12.817	0.00000	106.26

Variable	Std. Dev.	C.V.	Skewness	Ex. kurtosis
SSAGDP	2712.4	1.4482	3.5585	17.161
ODA	67.492	1.0175	3.6237	17.887
INF	91.382	7.0265	25.861	727.40
GS	11.855	0.64349	0.25475	0.75377
IR	10.059	0.44404	0.97526	2.6566
TR	30.690	0.45480	0.79225	0.23902
FD	16.909	0.95014	2.3434	6.2161

Variable	5% perc.	95% perc.	IQ Range	Missing obs.
SSAGDP	251.84	7306.0	1295.7	36
ODA	11.079	182.62	42.055	57
INF	−2.6964	30.456	9.2993	40
GS	0.91959	40.062	13.212	307
IR	9.0944	41.012	11.144	139
TR	30.845	126.17	42.747	123
FD	2.7382	60.190	12.468	74

Chapter 7

Conclusions

Using the econometrics model as an evaluation framework in this study I try to study the relationship between foreign aid and economic growth. In which, foreign aid is measured as Official Development Assistance, ODA, and per capita GDP as economic growth for Sub-Saharan Africa from 2000 to 2020. The estimated coefficient of the ODA is positive as expected. That is foreign aid has a positive effect on the economic growth of Sub-Saharan Africa. The result of this research is in line with vast recent literature that foreign aid promotes growth. From the analysis of data, the description of the employed model finds that foreign has a positive effect on the Economic Growth of sub-Saharan Africa. However, the interlink between aid economic growth and other independents (ie. investment)

Given the fact that the regression model estimation indicates that there is a positive impact of foreign aid, that does not fully capture the development outlook of sub-Saharan Africa. Other factions such as the economic activity of developed countries, war, climate change conditions, etc. may influence the economy of the region. These are also instrumental in the growth equation of developing economies. Notwithstanding, I can say aid contributes to growth in sub-Saharan Africa.

In summary, the study suggests that aid effectiveness will be fully captured when the donors as well as the recipient countries need to play a larger role in order for aid to be used efficiently and effectively. Effective development policies need to be in place to make Foreign aid more effective in improving economic growth and quality of governance. Even though the results of the study indicate that foreign aid contributes to economic growth nevertheless economic growth encompasses wide aspects therefore, in order to fully maintain these analysis results, all these factors need to be considered.

Limitation of the study; Due to the large gap of missing data for some countries,

the study estimates the data from 2000 to 2020 in the regression model. The shorter time frame has resulted in increased serial correlation, which may bias the results. In the future, estimation with standard errors, which are consistent in the presence of serial correlation and heteroskedasticity, should be employed.

An extremely interesting subject for future research is how would sub-Saharan Africa's economy be without foreign aid?

Bibliography

- [1] “Adjustment lending policies for sustainable growth /”. In: (1990). Includes bibliographical references., viii, 118 p. URL: <http://digitallibrary.un.org/record/65833>.
- [2] Elizabeth Adusei. “The impact of Foreign Aid on Economic Growth in Sub-Saharan Africa: The mediating role of Institutions”. In: (2020).
- [3] Simplice A Asongu and Jacinta C Nwachukwu. “Foreign aid and governance in Africa”. In: *International Review of Applied Economics* 30.1 (2016), pp. 69–88.
- [4] Sikiru Babalola and Waliu Shittu. “Foreign aid and economic growth in West Africa: examining the roles of institutions”. In: *International Economic Journal* 34.3 (2020), pp. 534–552.
- [5] Edmar L Bacha. “A three-gap model of foreign transfers and the GDP growth rate in developing countries”. In: *Journal of Development economics* 32.2 (1990), pp. 279–296.
- [6] Badi H Baltagi and M Hashem Pesaran. *Heterogeneity and cross section dependence in panel data models: theory and applications introduction*. 2007.
- [7] PT Bauer. In: 20.4 (1976). ISSN: 0033-5002. URL: <https://search.informit.org/doi/10.3316/informit.170704891901380>.
- [8] Peter Boone. *The impact of foreign aid on savings and growth*. London School of Economics and Political Science, Centre for Economic ..., 1994.
- [9] Markus Brückner. “On the simultaneity problem in the aid and growth debate”. In: *Journal of Applied Econometrics* 28.1 (2013), pp. 126–150.
- [10] Craig Burnside and David Dollar. “Aid, policies, and growth”. In: *American economic review* 90.4 (2000), pp. 847–868.
- [11] Lisa Chauvet and Patrick Guillaumont. “Aid and performance: a reassessment”. In: *Journal of Development Studies* 37.6 (2001), pp. 66–92.

- [12] Hollis B. Chenery and Alan M. Strout. “Foreign Assistance and Economic Development”. In: *The American Economic Review* 56.4 (1966), pp. 679–733. ISSN: 00028282. URL: <http://www.jstor.org/stable/1813524> (visited on 04/13/2022).
- [13] Sophannak Chorn and Darith Siek. “The impact of foreign capital inflow on economic growth in developing countries”. In: *Journal of finance and economics* 5.3 (2017), pp. 128–135.
- [14] Paul Collier and David Dollar. “Aid allocation and poverty reduction”. In: *European economic review* 46.8 (2002), pp. 1475–1500.
- [15] Harsh Desai. “States of fragility and official development assistance”. In: (2020).
- [16] David Dollar and Aart Kraay. “Growth is Good for the Poor”. In: *Journal of economic growth* 7.3 (2002), pp. 195–225.
- [17] William Easterly. “Are aid agencies improving?” In: *Economic Policy* 22.52 (2007), pp. 634–678.
- [18] William Easterly and Ross Levine. “Tropics, germs, and crops: how endowments influence economic development”. In: *Journal of monetary economics* 50.1 (2003), pp. 3–39.
- [19] David Fielding, Mark McGillivray, and Sebastian Torres. “A Wider Approach to Aid Effectiveness”. In: *UNU-WIDER Research paper* 23 (2006).
- [20] Karuna Gomanee, Sourafel Girma, and Oliver Morrissey. “Aid and growth in Sub-Saharan Africa: accounting for transmission mechanisms”. In: *Journal of International Development* 17.8 (2005), pp. 1055–1075.
- [21] KEITH GRIFFIN. “FOREIGN CAPITAL, DOMESTIC SAVINGS AND ECONOMIC DEVELOPMENT”. In: *Bulletin of the Oxford University Institute of Economics & Statistics* 32.2 (1970), pp. 99–112. DOI: <https://doi.org/10.1111/j.1468-0084.1970.mp32002002.x>. eprint: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1468-0084.1970.mp32002002.x>. URL: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1468-0084.1970.mp32002002.x>.
- [22] Keith B Griffin and John L Enos. “Foreign assistance: objectives and consequences”. In: *Economic development and cultural change* 18.3 (1970), pp. 313–327.
- [23] Kwabena Gyimah-Brempong. “Aid and economic growth in LDCS: Evidence from Sub-Saharan Africa”. In: *The Review of Black Political Economy* 20.3 (1992), pp. 31–52.

- [24] Henrik Hansen and Finn Tarp. “Aid and growth regressions”. In: *Journal of development Economics* 64.2 (2001), pp. 547–570.
- [25] Henrik Hansen and Finn Tarp. “Aid effectiveness disputed”. In: *Journal of International development* 12.3 (2000), pp. 375–398.
- [26] Derek Headey. “Geopolitics and the effect of foreign aid on economic growth: 1970–2001”. In: *Journal of International Development: The Journal of the Development Studies Association* 20.2 (2008), pp. 161–180.
- [27] Stephen Howes. “An overview of aid effectiveness, determinants and strategies”. In: *Development Policy Centre Discussion Paper* 1 (2011).
- [28] World Development Indicators and OECD <https://stats.oecd.org/>. “Economic Policy and Debt:Net official development assistance (ODA)”. In: (). URL: <https://data.worldbank.org/indicator/DI.ODA.ODAT.CD>.
- [29] Nihar Ranjan Jena and Narayan Sethi. “Foreign aid and growth nexus: empirical evidence from South Asian countries”. In: *South Asian Journal of Business Studies* (2020).
- [30] Georgios Karras. “Foreign aid and long-run economic growth: empirical evidence for a panel of developing countries”. In: *Journal of International Development: The Journal of the Development Studies Association* 18.1 (2006), pp. 15–28.
- [31] John Loxley and Harry A Sackey. “Aid effectiveness in Africa”. In: *African Development Review* 20.2 (2008), pp. 163–199.
- [32] Edmore Mahembe and Nicholas M Odhiambo. “Foreign aid and poverty reduction: A review of international literature”. In: *Cogent Social Sciences* 5.1 (2019), p. 1625741.
- [33] Mark McGillivray. “Is aid effective”. In: *Helsinki: World Institute for Development Economics Research (draft), ca. February (mimeo)* (2005).
- [34] Oliver Morrissey. “Does aid increase growth?” In: *Progress in development studies* 1.1 (2001), pp. 37–50.
- [35] Paul Mosley. *Foreign aid, its defense and reform*. University Press of Kentucky, 1987.
- [36] Paul Mosley, John Hudson, and Sara Horrell. “Aid, the public sector and the market in less developed countries: A return to the scene of the crime”. In: *Journal of International Development* 4.2 (1992), pp. 139–150.

- [37] “N.H. Stern on substance and method in development economics”. In: *Journal of Development Economics* 2.4 (1975), pp. 387–405. ISSN: 0304-3878. DOI: [https://doi.org/10.1016/0304-3878\(76\)90009-2](https://doi.org/10.1016/0304-3878(76)90009-2). URL: <https://www.sciencedirect.com/science/article/pii/0304387876900092>.
- [38] OECD. *Low-Performing Students*. 2016, p. 212. URL: https://www.oecd-ilibrary.org/development/net-oda/indicator/english_33346549-en.
- [39] Kate Phylaktis and David Blake. “The Fisher hypothesis: Evidence from three high inflation economies”. In: *Weltwirtschaftliches Archiv* 129.3 (1993), pp. 591–599.
- [40] Richard Reichel. “Development aid, Savings and Growth in the 1980s: a cross-section analysis/aide au développement, espargnes et croissance dans les années 1980: une analyse en section transversale”. In: *Savings and Development* (1995), pp. 279–296.
- [41] Paul M Romer. “Increasing returns and long-run growth”. In: *Journal of political economy* 94.5 (1986), pp. 1002–1037.
- [42] Ram D Singh. “State intervention, foreign economic aid, savings and growth in LDCs: Some recent evidence”. In: *Kyklos* 38.2 (1985), pp. 216–232.
- [43] Brian Snowdon. “The Solow Model, Poverty Traps, and the Foreign Aid Debate”. In: *History of Political Economy* 42 (Dec. 2009). DOI: [10.1215/00182702-2009-026](https://doi.org/10.1215/00182702-2009-026).
- [44] Robert M Solow. “Robert M. A Contribution to the Theory of Economic Growth. The Quarterly Journal of Economics, vol. 70, no. 1, 1956, pp. 65-94. JSTOR”. In: (). URL: <https://www.jstor.org/stable/1884513>.
- [45] Lauren Tait, B Siddique MA, and Ishita Chatterjee. *Foreign aid and economic growth in Sub-Saharan Africa*. University of Western Australia, Business School, Economics Australia, 2015.
- [46] Finn Tarp and David Roland-Holst. “New perspectives on aid effectiveness”. In: *New Perspectives on Aid Effectiveness* (2004), pp. 43–62.
- [47] M.P. Todaro and S.C. Smith. *Economic Development*. Addison-Wesley series in economics. Addison Wesley, 2003. ISBN: 9780201770513. URL: <https://books.google.it/books?id=UR-6AAAAIAAJ>.
- [48] Ian Vásquez. “Official assistance, economic freedom, and policy change: Is foreign aid like champagne”. In: *Cato J.* 18 (1998), p. 275.
- [49] Constantin S Voivodas. “Exports, foreign capital inflow and economic growth”. In: *Journal of international Economics* 3.4 (1973), pp. 337–349.

- [50] Website. “GDP (gross domestic product)”. In: (). URL: <https://www.gfmag.com/global-data/glossary/gdp-gni-definitions>.

Appendix A

Selected Countries in SSA for the Study

List of selected sub-Saharan Africa countries	
The Gambia	South Africa
Gabon	South Sudan
Ghana	Mali
Guinea-Bissau	Madagascar
Guinea	Mozambique
Angola	Mauritania
Benin	Mauritius
Burkina Faso	Malawi
Burundi	Eritrea
Botswana	Ethiopia
Cabo Verde	Equatorial Guinea
The Central African Republic	Namibia
Chad	Niger
Cameroon	Nigeria
Cote d'Ivoire	Kenya
Comoros	Liberia
Democratic Republic of the Congo	Lesotho
Republic of the Congo	Rwanda
Sudan	Togo
Senegal	Tanzania
Sierra Leone	Uganda
Somalia	Zambia
Sao Tome and Principe	Zimbabwe

Table A.1: Caption

Average Time Series Plot of the data for selected Sub-Saharan Africa countries

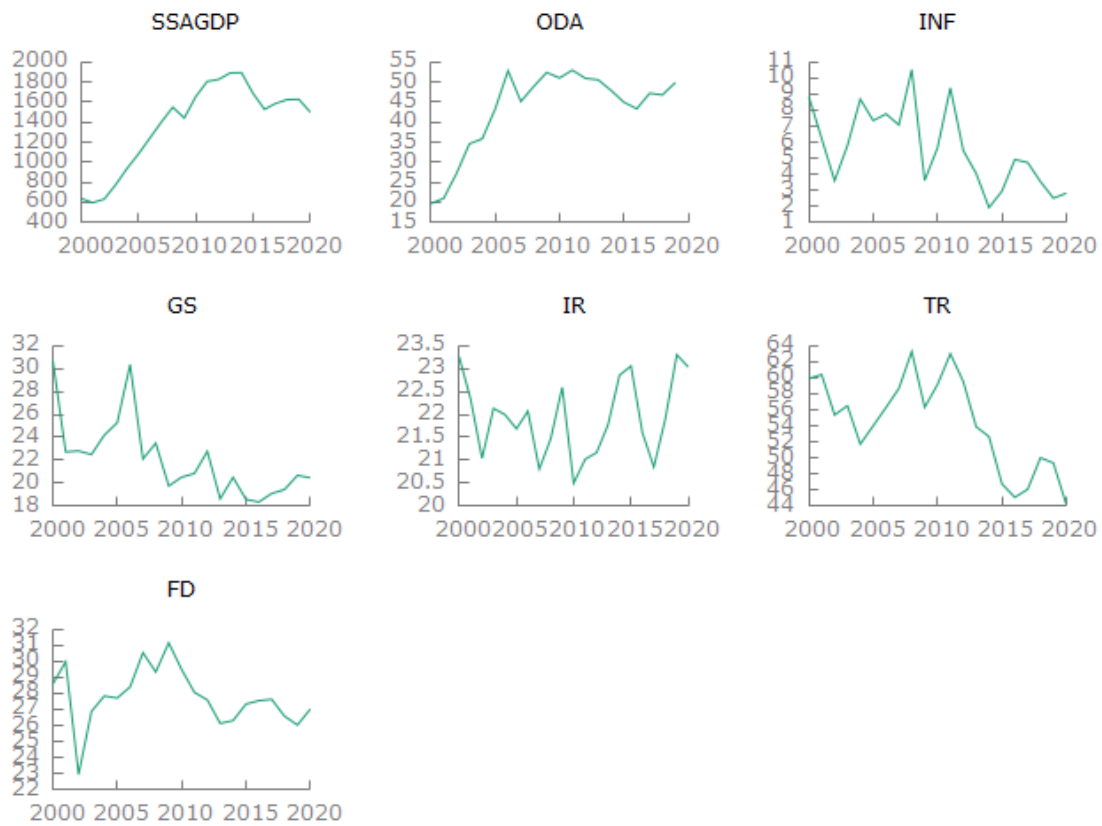


Figure A.1: Source: Derive from World bank Data

Appendix B

Steady State in Solow Model

Finding the Solow steady state: To characterize steady state in Solow model is a situation where y and k are constant over time.

Since

$$\dot{k} = \frac{\dot{K}}{AL}, \quad \frac{\dot{k}}{k} = \frac{\dot{K}}{K} - \frac{\dot{A}}{A} - \frac{\dot{L}}{L} = \frac{\dot{K}}{K} - n - g \quad (\text{B.1})$$

So, if k is unchanging, $\dot{k} = 0$ and K must be growing at rate $n + g$
In the Solow model:

- L grows at rate n and A grows at rate g .
- The growth of K is determined by saving.

Since Y depends on K , AL , then at steady state it seems highly unlikely that output is going to be unchanging.

$$\begin{aligned} \frac{\dot{k}}{k} &= \frac{\dot{K}}{K} - n - g \\ &= \frac{sY - K}{K} - n - g \\ &= \frac{sY}{K} - \delta - n - g \\ &= \frac{sf(k)}{k} - \delta - n - g \end{aligned} \quad (\text{B.2})$$

Therefore, steady-state is given as $\dot{k} = sf(k) - (n + g + \delta)k$

Harrod-Domar Model

The two-sector economy, a consumption good and a capital good (households and firms) we can write simple national income equation as follows:

$$Y_t = C_t + S_t \quad (\text{B.3})$$

Where, consumption and Saving. It is assumed that all savings are invested. For an economy to grow net additions into capital stock is required through investment. The net addition into capital stock (K) over time is given by following equation:

$$K_{t+1} = I_t + (1 - \delta)K_t \quad (\text{B.4})$$

Where, capital associated with all production techniques depreciates at an exponential rate δ . (δ is the rate of the depreciation of the capital stock). We assume constant returns to scale. The capital output ratio $\frac{K}{Y} = v$ is assumed to be fixed. Given that saving is some proportion of the GDP $\delta_t = sY_t$ and $K = vY$, we can write the equation.B.4 as follows.

$$vY_{t+1} = sY_t + (1 - \delta)vY_t \quad (\text{B.5})$$

Divide both sides by v and by subtracting Y_t form both sides of equation.B.5, we get

$$Y_{t+1} - Y_t = \left(\frac{s}{v} - \delta\right)Y_t \quad (\text{B.6})$$

Dividing by Y_t to both sides we arrive at following equation

$$[Y_{t+1} - Y_t]/Y_t = (s/v - \delta) \quad (\text{B.7})$$

Where; $[Y_{t+1} - Y_t]/Y_t$ is the GDP growth rate. Let $G = [Y_{t+1} - Y_t]/Y_t$ we can rewrite the equation.B.7 as follows.

$$G = (s/v - \delta) \quad (\text{B.8})$$

This equality states that the growth rate of output is the ratio of national saving rate (s) to the fixed capital output ratio (v). The higher the saving rate and lower the capital to output ratio and depreciation rate, the faster will an economy grow.

Appendix C

Foreign Aid and Investment

Though there is positive connection between foreign aid and investment, but at minimal rate. Foreign aid is one the components of foreign capital for the sub-Saharan Africa. The coefficient of variation for foreign aid, is found to be 3,7 percent, which indicates that foreign aid is the low volatile to gross investment.

Figure below show the economics relationship between foreign aid and gross investment in sub-Saharan Africa from 2000 to 2020. The OLS regression estimation is presented in the table 6

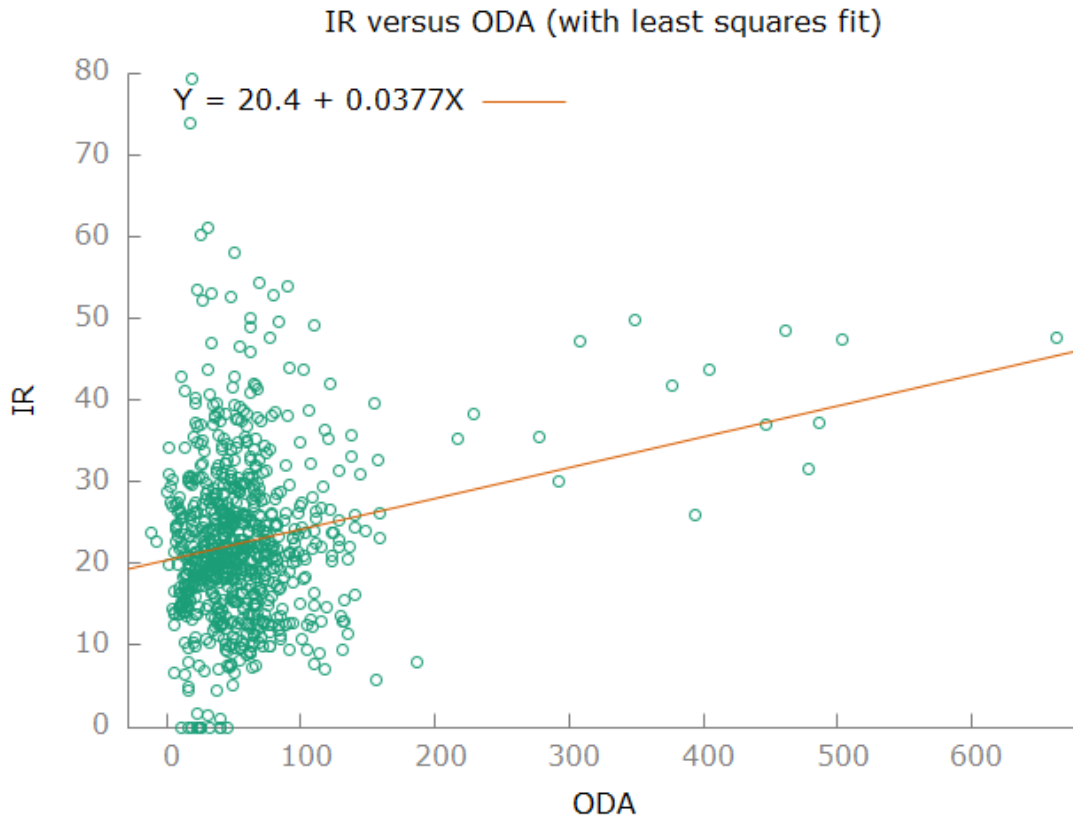


Figure C.1: Source: Derive from World bank Data

$$[h]\widehat{IR} = 20.4303 + 0.0377169 \text{ ODA}$$

(0.49829) (0.0060431)

$T = 788 \quad \bar{R}^2 = 0.0460 \quad F(1, 786) = 38.954 \quad \hat{\sigma} = 9.8479$
 (standard errors in parentheses)

Model 2: OLS, using 788 observations
 Dependent variable: IR

	Coefficient	Std. Error	t-ratio	p-value
const	20.4303	0.498286	41.00	0.0000
ODA	0.0377169	0.00604310	6.241	0.0000

Mean dependent var	22.63889	S.D. dependent var	10.08256
Sum squared resid	76227.09	S.E. of regression	9.847895
R^2	0.047220	Adjusted R^2	0.046007
$F(1, 786)$	38.95392	P-value(F)	7.09e-10
Log-likelihood	-2919.481	Akaike criterion	5842.963
Schwarz criterion	5852.302	Hannan-Quinn	5846.553

Test for normality of residual –

Null hypothesis: error is normally distributed

Test statistic: $\chi^2(2) = 100.483$

with p-value = 1.51459e-022

Chow test for structural break at observation 23:21 –

Null hypothesis: no structural break

Test statistic: $F(2, 784) = 1.23126$

with p-value = $P(F(2, 784) > 1.23126) = 0.292488$

White's test for heteroskedasticity –

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 0.682653

with p-value = $P(\chi^2(2) > 0.682653) = 0.710827$

Test for omission of variables –

Null hypothesis: parameters are zero for the variables

ODA

Test statistic: $F(1, 786) = 38.9539$

with p-value = $P(F(1, 786) > 38.9539) = 7.09144e-010$