FOREIGN AID IMPACT ON ECONOMIC GROWTH: A CASE STUDY OF AGRICULTURE, INDUSTRY AND SERVICE SECTORS IN KENYA.

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DECLARATION

This research project is my original work and has never been presented to any other university for the award of degree/diploma/certificate

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This research project has been submitted for examination with my approval as the university supervisor

Signed  **Date: 12.11.2021**

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LIST OF ABBREVIATIONS AND ACRONYMS

GDP	Gross Domestic Product
KNBS	Kenya National Bureau of Statistics
GoK	Government of Kenya
IMF	International Monetary Fund
HIPC	Highly Indebted Poor Country
KES	Kenya Shillings
FY	Financial Year
EU	European Union
CBK	Central Bank of Kenya
VECM	Vector Error-Correction Model
LDC	Least Developed Countries
SSA	Sub Saharan Africa

ABSTRACT

Kenya has been receiving foreign assistance and inflows to support government spending especially development expenditure. Foreign aid and national government expenditures in Kenya, however, have raised concern as to whether they are matched by economic outcomes. Despite the huge, and continually increasing foreign aid inflows in the two decades, the economic growth achieved in Kenya over the same period has not been satisfactory. Little research has paid attention into aid effectiveness. This study utilized data on net foreign aid, economic and sectoral growth from World Bank's Country Economic Indicators to study aid effectiveness in Kenya. The general production function was utilized to determine foreign aid flows effect on economic growth of agriculture, service and industry sectors in Kenya. Results show foreign aid has significant and positive effect on growth of service sector in Kenya. However, aid does not significantly influence growth of agriculture and industry sectors in the country. To facilitate more growth of the economy, the country needs to increase the proportion of aid that is channeled to the service sector. The increments will see a further increase in output which will be reflected in GDP growth. Some of the areas where the country needs to increase the proportion of aid is on ICT and tourism sectors. These sectors have recently proven to contribute highly on growth of GDP. Tourism has particularly been adversely affected by Covid-19, thus channeling more aid to this sector would highly increase its growth and in turn growth in GDP levels.

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

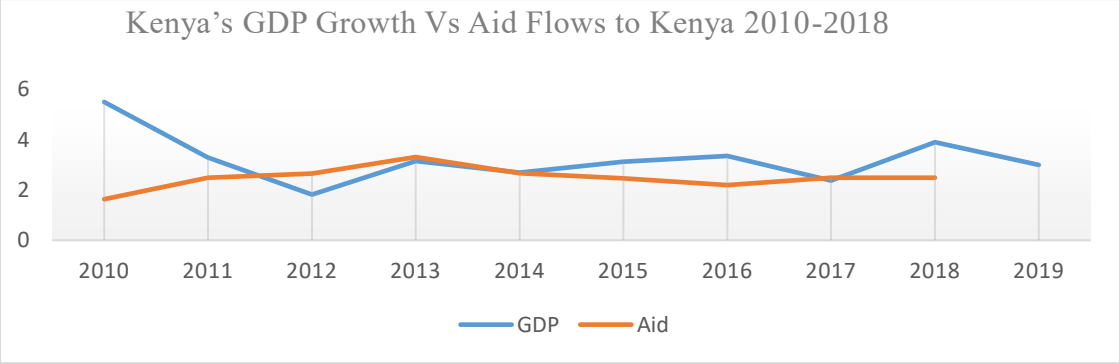
The economic rationale for aid is assumed on the argument that for recipient countries, macroeconomic contribution of aid is positive. This is through the simulation of improved resource allocation and economic policies. Africa is dependent on aid both in institutional mechanisms of flow aid and in the aid quantity. Scholars who support foreign aid, argue that aid is essential for developing countries' economies and it assists in improving human development mostly for countries with sound political and economic policies.

Foreign aid injections form a very significant factor of the growth of the economy since the recipient economy may not have all the resources needed to catapult its development and economic sustainability. Foreign aid's main role is to support economic growth, foreign aid adds to domestic sources of finance that include savings and leading to increased capital stock and investment amount. According to Metzger (2015), there are various ways that aid can play a part in economic growth. Aid leads to increased investment in human and physical capital as well as high import capital goods/technology transfer capacity subsequently increasing capital productivity and promoting endogenous technical changes and results in economic growth. According to Harrod (1939) and Domar (1946), foreign aid helps to close up savings-investment gap and foreign exchange gap and results in high economic growth resulting from increased infrastructure that lead to productive sectors like manufacturing, agriculture and introducing advanced technologies and ideas. These changes strengthen the health sectors, education sectors, political systems and environment. Aid is utilized to assist provision of food for subsistence consumption and aid leads to a stable economy following shocks and thus increased economic growth according to Javid and Qayyum (2011).

As Amin (2017) points out, a number of channels exist through which foreign aid impacts the growth of recipient economy. Aid increases investment in both human and physical resources as well as the capacity to import technology which spurs productivity of capital. This eventually leads to better economic outcomes. Aid also augments government efforts in eradicating poverty and reducing unemployment (Amin, 2017) as well as supporting implementation of national development programs.

Whereas Sub-Sahara Africa countries, Kenya included, have received significant amounts of aid in the last three decades, their countries are still identified with debt, high unemployment levels, poverty and a stagnated performance of the economy. Average income per capita has decreased in the region since the 1970s despite very high flow of aid (Arvin & Lew, 2015). Developing countries such as Kenya, having relied heavily on foreign aid, are facing huge foreign debt and resorting to debt restructuring using additional aid (Amin, 2017). This informs the raging debate on whether borrower countries should continue procuring aid when not much is recorded for the aid so far received. In Kenya, going by statistics from the World Bank Economic Indicators reports, the annual GDP has been below the 2010 level while aid has been above its 2010 level as Figure 1 attests.

Figure 1: Kenya's GDP Growth Vs Aid Flows to Kenya 2010-2018



Source: World Bank Economic Indicators, 2020

It is obvious that aid will work differently in each country, since the effectiveness of the institutions responsible for development, and the measures in place to put the money into good use. Therefore, we cannot carry out a blanket assessment of the effectiveness of aid across a certain region, without consideration of how the individual countries utilize the aid resources, and even precisely on the sectoral level. Aid, generally will work differently for the country with effective and well-structured organizations and human resources with higher levels of skills.

If the declines in domestic saving is anything to go by, increased flow of aid is a replacement rather than an increase to domestic saving. Governments in these countries do not have fiscal discipline and hence use countries resources in place of their domestic revenues. Aid could have led to reduced domestic savings and fiscal deficit. The countries that receive aid, find planning for long-term development and policy formulation impossible due to unpredictability of aid flow in the future. Negative results of aid on domestic savings and volatility of aid possibly result to its Unfavourability of aid to economic growth is brought about by its volatility and its negative effect on domestic savings.

From economic view, public and private capital flows functions are indistinguishable. They are distinguished by the recipient depending on the level at which they lead to development. To capital provider, variations are higher. Public capital is designed to further development of a recipient country's development of the economy and it has different forms. This can be acceleration of the rate of economic growth, quality improvement in labour, a fast increase in the stock of capital, significant alter in what constitutes output and differ in institutions and attitudes. Then there is no private investment or external assistance, a developing country is required to supply all the requirements using its country resources while export earnings could finance the imports.

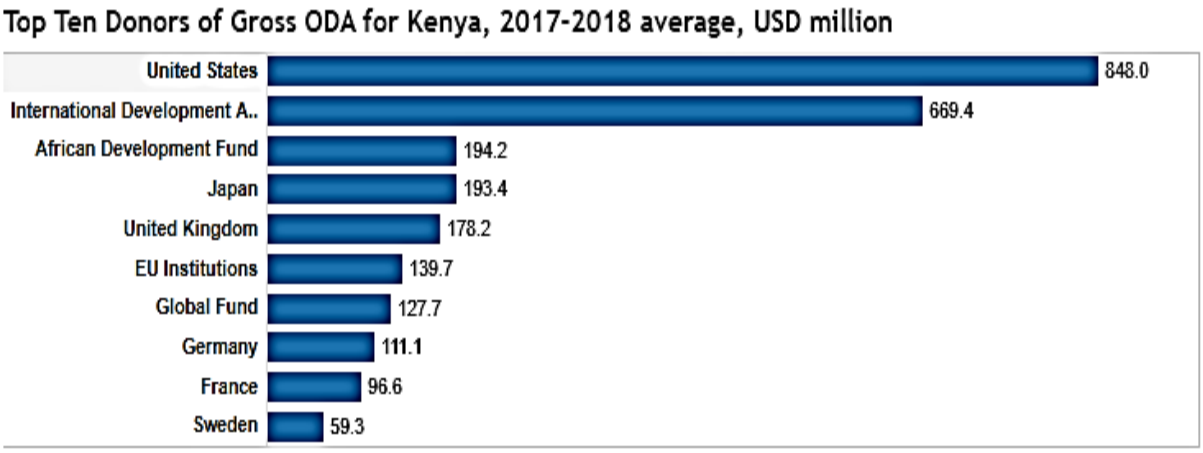
The question as to how aid into Kenya has affected its economic development has been a matter of intense debate by many scholars and policy makers over time. The fact that the donor countries and organizations have huge expenditure on aid programs to various countries yet there is a perceived lack of effective results from the disbursements, especially in Sub-Sahara Africa, has fueled concerned over whether this development aid has been, or is, of any value.

1.1.1 Foreign Aid to Kenya

Aid flows to Kenya in two forms: as grants which are classified as revenues or as loans which are classified as expenditures. Further, donors disburse money as appropriations-in-aid (A-in-A) which is categorized as revenue. In the case of A-in-A, donors control the funds directly as they liaise with those who are in charge of the projects in ministries and who also are involved in the procurement of goods and services. However, A-in-A disbursements sometimes leads to overspending by the donors and it is hard to estimate the amounts spent for public purposes. In some instances, A-in-A projects stall. A-in-A goes to the Treasury directly from Central Bank of Kenya special accounts.

Aid to Kenya has increased steadily since the 1960s. In the last two decades, the bias of aid has been towards capital projects and technical assistance aimed at spurring economic growth through key sectors like agriculture, industry and services, consequently reducing the levels of poverty. The major country donors are German, United Kingdom, France, United States, Japan and Sweden.

Figure 2: Top Ten Donors of Gross ODA for Kenya, 2017-2018 average (USD Million)



Source: OECD, 2019

There has been aid from multi-lateral resources as well. Here, the African Development Bank (AfDB), World Bank, the Organization for Economic Co-operation and Development (OECD), European Union (EU), International Monetary Fund (IMF). International Monetary Fund (IMF) and Development Assistance Committee (DAC) have been the major donors. The Kenya government's efforts to plug the deficits in the budgets on the last decade have relied heavily on the budget support programs offered by these multilateral organizations.

Since 2002, upon entry of a government that enjoyed positive donor confidence, the aid flows to Kenya have been on the rise. This was partly because the donor community was satisfied with the resolve to fight corruption and graft that was rampant in the previous regime. Whereas corruption cases and rampant embezzlement has been more pronounced in the last decade, the aid inflows have been fairly consistent.

Table 1: Net Official Development Aid to Kenya 2016-2018

Receipts for Kenya

	2016	2017	2018
Net ODA (USD million)	2,188.4	2,480.2	2,488.4
Net ODA/GNI (%)	3.2	3.2	2.9
Gross ODA (USD million)	2,594.4	2,949.0	2,982.1
Bilateral share (gross ODA) (%)	61.8	58.2	58.5
Total net receipts (USD million)	2,681.5	3,299.6	3,220.1

For reference

	2016	2017	2018
Population (million)	49	50	51
GNI per capita (Atlas USD)	1,360	1,440	1,620

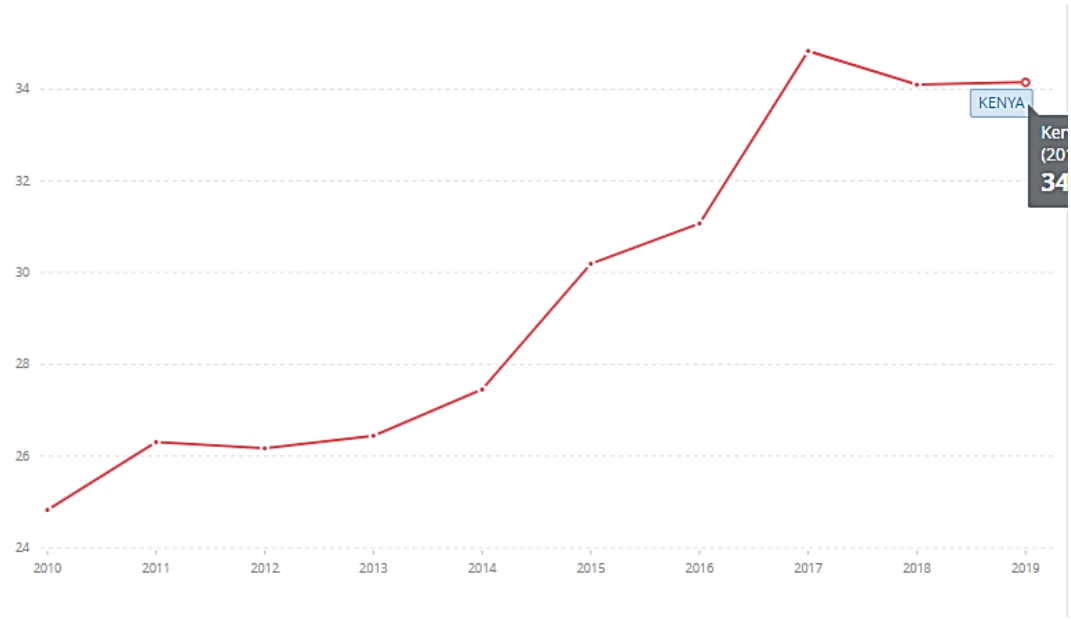
Source: OECD 2019

1.1.2 Economic Growth in Kenya

Kenya's economic growth is observed to be fairly stagnant over the last decade. Consequently, Kenya has had a fall in its gross investment in the economy. This has resulted in lost competitiveness as a preferred destination for investment. The reasons that attempt to explain this scenario are many and varied. They range from inappropriate strategies for development, limited relevant infrastructure, political uncertainty and an unstable macroeconomic environment.

In terms of sectoral funding from aid, agriculture, for instance, has been a major target of foreign aid since it is the backbone of the Kenya economy. Such aid, coupled with investments from the budgetary allocations, have seen some improvement in the last decade much as its share as the percentage of GDP has reduced significantly since the 80s.

Figure 3: Agricultural Growth as a Percentage of GDP 2010-2019



Source: World Bank Economic Indicators, 2020.

The fig suggests positive impact of aid in agriculture up to 2017. A different story thereafter. Show also the trends of service and manufacturing industries, as well as the overall economy.

Kenya, in the economic blueprint 'Vision 2030' placed emphasis on key sectors which when developed, can help expand the economy, lower unemployment levels and reduce the extreme poverty. These sectors are; agriculture, industrialization and the service industry. To realize significant improvement in them, the Kenya government has placed huge resources towards spurring their growth. However, the outcomes as not clear and at best, they have been a subject of economic conjecture.

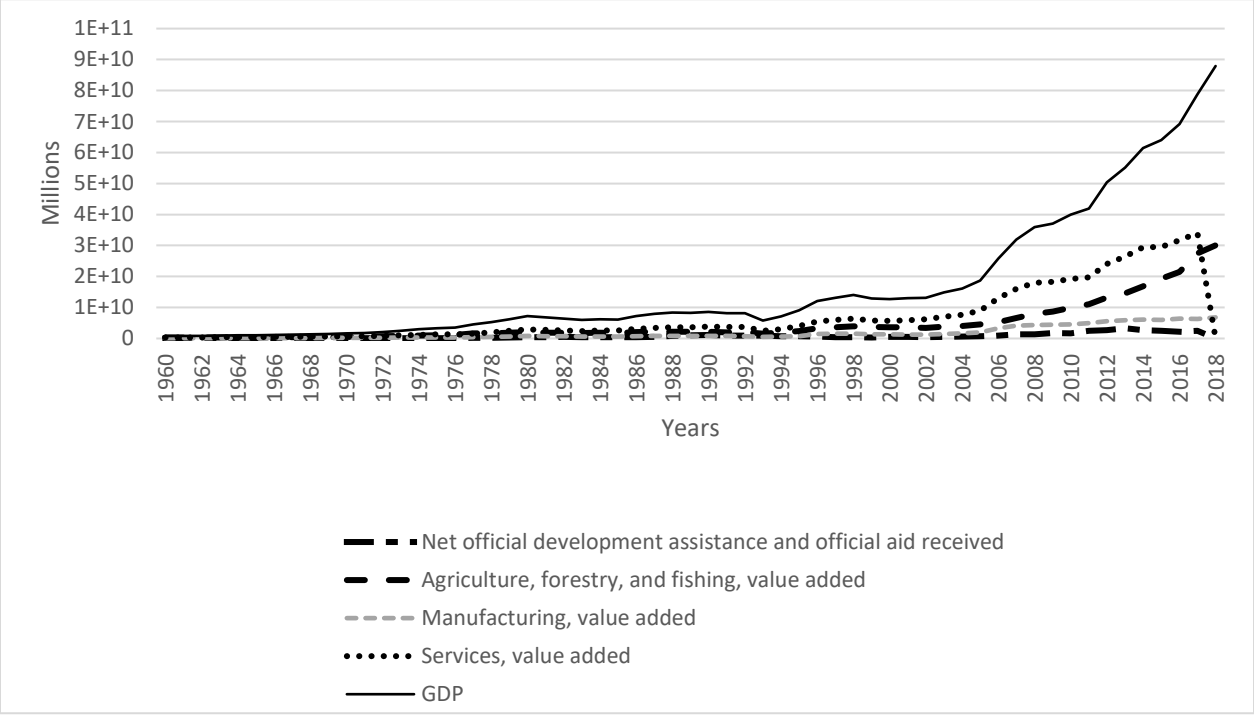
In the decade 2009 -2019, the contribution of Agriculture to the GDP in Kenya increased, albeit slowly. In 2009, agriculture contributed 23.36% to GDP whereas in 2019, it contributed 34.15%.

The service industry contributes a big share of GDP, but it has been declining over the last decade. In 2019, service industry contributed 43.221% to GDP against 49.221% in 2009. Manufacturing industry contributed 18.479% in 2009, and over time the share had reduced to 16.146% in 2019. (World Bank, 2020).

1.1.3 Performance of the agriculture, industry and service sectors in Kenya

A review of the performance of value addition for agriculture and service sectors shows a fairly increasing trend over the years as seen in figure 5. However, the value addition in the manufacturing sector seem to be constant over the periods under analysis. Though value addition below 1990 seem to be the same for the three sectors, in 1996 onwards, the service sector is observed to have a high increment of value addition as compared to agriculture and manufacturing sector.

Figure 4: Performance of the agricultural, industry and service sectors



The period 1990s coincides with the period when Kenya joined WTO and thus adjusted its policies to be a more open economy. These adjustments could be the reason why most of the indicators reflect an increment onwards. The four indicators; GDP, agricultural, manufacturing and service value addition seem to have a similar trend as they are growing in similar patterns since 1994. Though not by much, development assistance and aid received is also observed to increase overtime, with significant increments observed from 1996 towards 2018.

1.2 Statement of the Problem

In spite of rise in foreign aid inflows into Kenya in the past decade, it remains a matter of debate as to whether there is a commensurate sectoral and macro-economic growth. The true impact of foreign aid is a subject matter to donor community as well as policy makers. The scholars who are against aid argue that aid results into a "moral hazard" problem in cases where the government spends money without a firm budget constraint, while being convinced that donors will relieve them out of any difficulty. This may result to Donors, who desire to assist (or are devoted to transfer money for other reasons), being compelled to oblige.

Most of the studies conducted so far have assessed the aid-economic growth nexus from a macroeconomic perspective or focused on cross country research. However, it is important to look into Kenya on its own, and the sectoral growth since foreign aid may have altered impact at the sector level compared to the aggregate level.

As a matter of consideration, every donor has distinct ways to establish, plan, put into effect, monitor and evaluate activities, and the reporting requirements. In other instances, Kenya has contrasting donor policy priorities, maybe contradictory, resulting into implementation of inconsistent policy reforms. At times, donors reach terms on their projects with the ministries, avoiding other relevant authorities. Whereas Amin (2017) argues that rising foreign aid towards

economic projects lead to noticeable economic growth, Herzer and Morrissey (2011) and Collier and Dehn (2001) state, there is a negative effect of foreign aid on economic growth. The different studies have led to mixed results. There are also different donor regulations and policies in other developing countries. The study seeks to determine the impact aid has on sectoral economic growth in Kenya, specifically on agriculture, industry and services sectors.

1.3 Objectives of the Study

The main objective of this study is to investigate the impact of foreign aid on economic growth in Kenya's major sectors as identified in Vision 2030.

Specific Objectives

1. To find out the effect of foreign aid on growth of agriculture sector in Kenya.
2. To investigate the impact of foreign aid on growth of Kenya's industrial sector.
3. To identify the effect of foreign aid on the growth of services sector in Kenya.

1.4 Significance of the Study

Although foreign aid is crucial in a recipient country's economic development, the results are not always the same in each of the countries. Further, aid can work well for a certain sector, as opposed to another sector, in the very same country. It is disturbing to note that Kenya continues to complain over unemployment, high debt and increased poverty levels. GDP growth in Kenya is low even with high aid inflows as reflected in the above diagram.

This study shall assist in understanding the impact and benefits foreign aid has afforded key economic sectors in Kenya; agriculture, industry and service sectors. By so doing, we shall understand the extent to which aid has helped or not, and inform policy on aid. This study will benefit researchers in the area of public finance since it will become the basis for future research and add on empirical literature on foreign aid effect on Kenya's sectoral growth.

1.5 Scope of the Study

The study is restricted to 1981-2018 which is a period long enough to show effect of foreign aid on economic growth in Kenya and the selected sectors. Secondly, Kenya has witnessed fluctuations in the amounts of aid flows over this period and therefore, it is possible to review the effects of these fluctuations on economic growth.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter highlights review of literature regarding economic growth and foreign aid. The first section discusses a theoretical review, where growth models linking with foreign aid are discussed. The second subsection conducts an empirical review on various studies that have analyzed economic growth and foreign aid on various countries. Finally, the last section gives a general overview of the literature.

2.2 Theoretical Literature Review

Economic growth in theory has been shown to emanate from various factors. However, the mainstream growth models are divided into two main categories; exogenous growth models and endogenous growth models. These categories are linked with foreign aid as a contributor to developing countries' economic growth. A further strand of literature called the gap theory, which justifies why aid is needed is also reviewed in subsequent sections. Earlier theories supported that foreign aid provided the essential financial resources to develop the various economic sectors in developing countries to grow a livelihood. The key assumption is that a positive impact on key economic sectors such as services, industry and agriculture would reduce poverty, then aid plays a role in reducing poverty (White, 2015). Contrary to this, some scholars argue that foreign money injections may precipitate a syndrome of dependency, promoting rent or fraud, out-of-pocket money and Dutch diseases (World Bank, 2017).

2.2.1 Exogenous growth theories

Two important pioneering exogenous theories that try to explain economic growth; Growth model by Harrod-Domar and Solow models formulated by Evsey Domar (1946) and Ray F. Harrod (1939). The model underscores high rates of capital accumulation are the key determinants of high economic growth. Capital accumulation inform of investments generates income through the

multiplier effect and increases productivity of an economy. Domestic saving dictates the available investment level in terms of capital and subsequently dictate the rate of growth attainable i.e., available capital. With low domestic savings then aid assists to fill the savings gap. Schaffner, (2014) argues that saving-investment gap filled by foreign aid is not utilized for consumption rather for investment and will be required when domestic capital is low and investments returns are positive. If poor incentives to invest result to low investments, foreign aid would finance non-investment instead of investments.

Solow model is extension of Harrod-Domar model. The model introduces labor and technology in the analysis of economic growth. Technology is always assumed to be given (exogenous) thus, Solow model is also called the exogenous growth model. In broader macroeconomic sense technology includes government distortions, protection of property rights and things of this sort. This suggests that with equal amount of labor and capital, a country can have higher output than the other since it has a less distorted economy with more efficient government. According to Solow (1956), the economy is into sectors; the labor/agricultural sector and the capital/industrial sector. Under capital sector, capital accumulation rate is usually higher than labor absorption rate. However, for a developing economy, agricultural sector has unrecognized unemployment and skilled labor shortage which negatively impact the productivity and wage rate of this sector. Low utilization of resources results in obstacles in the achievement of higher economic growth while constant growth is attainable with an increase in an economy's capital-labor ratio. Low capital is usually experience in most developing economies resulting in high dependency on foreign aid to supplement the scarce resources.

2.2.2 Endogenous Growth theories

Endogenous growth model, famous known to emanate from Arrow, Lucas and Romer, was dissatisfied with the exogeneity of technology. They argue that growth is created by factors that are generated by an economic system, particularly endogenous factors, rather than exogenous factors. The model extended the exogenous growth model by introducing technological progress. According to Schaffner (2014), positive growth rate and technological progress is in the long-run attained by knowledge accumulation, forward looking and profit maximizing agents. Moreover, the human capital stock determines growth rate. Also, growth will increase due to integration into world markets due to advanced knowledge and skills resulting to increased productivity of the workers. Human capital far from physical capital lead to increasing return. Thus, economies do not attain a steady state and there are always steady returns to capital. The growth rate hangs on the different capital types in a country other than capital accumulation. The theory results in potential for per capita income growth rates increase in the long-run. Also, foreign aid results into long run economic growth effects when in form of technologically advanced capital goods unlike domestic technology. For developing economies, it is impossible to allocate funds to invest the above sectors. The domestic capital partly meets their investment needs. For domestic capital support, there is dependency on aid since it is foreign with a low management skill, advanced technology, interest rates and research ideas (Morrisey, 2001).

2.2.3 The Gap theories

McKinnon (1964) pioneered two-gap theory, Chenery and Strout (1966) models involves two gaps, the first, also called the saving gap, gap between amount of investments that are required to reach a given growth rate and domestic savings. The argument is that an increase in investments provides an engine for economic development, which in turn increases output as well as per capita income. The required investments depend on the domestic savings. When required investment is

lower than domestic savings foreign assistance could fill this gap. The other gap is described as trade gap or the foreign exchange gap. Trade gap happens with a variance in the imports that are required for given levels of production and foreign exchange earnings. The argument is that, to increase output, capital goods should be imported, however, if the exports earnings are lower than the required imports, then foreign aid is needed to fill this gap. Finally, they argue that due to shortage of domestic resources, factors of production are also underutilized; however, with the foreign aid they will be producing with higher marginal rates if optimally utilized. According to Chenery and Strout (1966), always one gap exists at a receipt country and thus a need for aid.

A third gap model, established by Bacha and Taylor (1990) included fiscal gap as the third gap. The argument was that most developing countries showed that they lacked the capacity to raise revenue desired to spur meaningful investments. As a result of fiscal gap, when a country's resources are limited, government's efforts to increase private investment are restricted due to debt service (Pendharkar et al. 2008). As such, the argument was that these countries needed foreign aid to fill this fiscal gap. When aid is provided as a loan instead of a grant, it may in the long-run negatively affect the savings, fiscal and foreign exchange gaps, and general macroeconomic performance.

Other theories reviewed include: McKinnon Foreign Exchange Constraint Model (MFECM), state all developing countries experiencing a hold-up in trade require foreign aid as a stimulus to encourage favourable levels of economic growth. In addition, MFECM model argue foreign aid assists in getting rid of hold-ups of trade by supplying essential commodities that developing countries are not able to supply. MFECM model is centered on Chenery Bruno (1962) model assumption and what came after this model is dual gap model presented by Chenery & Strout in 1966. This model state that developing countries are likely to require foreign aid inflows to be able

to assist close the gap in savings and/or the gap in trade. That is if the country's investment is lower than the level that is required. Consequently, foreign aid has a positive influence to the economic growth of a country.

More so, the Big Push Theory suggest huge investment is necessary to conquer developing countries hurdles to economic development. Nonetheless, the challenge faced by most of the developing countries is that they are unable to collate immense amount of capital for investment. Therefore, as stated in the BIG Push Theory, through supply of enough quantity of foreign exchange reserves at a rate that is concessional foreign aid covers or eases capital deficit issues that every developing country face. Similar to the Big Push Theory, a model known as the Poverty Trap Model affirm that developing countries need an immediate introduction of aid to stimulate economic development and growth.

Keynesian theory of saving supports the perspective that growth is positively impacted by savings. Additionally, more studies affirm this association such as Turan and Olesia, Mohamed & Mandishekwa all in 2014, and Jagadeesh (2015). Consequently, every developing country ought to encourage savings culture in the country to advance their economies.

2.3 Empirical Literature review

Ouattara and Strobl (2003), analysis of Cote d'Ivoire for the period 1975 to 1999, showed that different aid types impact growth differently. They categorized foreign aid into program, project, food assistance and technological transfer. They used disaggregation approach and their results indicated that food assistance and technical assistance lead to high savings in a country and aid given for projects replace the savings. However, aid given for program work has no effect on public savings. Project aid lead to increased foreign aid dependence of Cote d'Ivoire whereas food aid and technical assistance lead to a reduced gap.

Doucouliagos and Paldam (2008) deliberated the effect of foreign aid on economic growth employing aid-growth regressions using data of a period of more than 40 years. Their dataset included 68 related studies that existed in literature and they subsequently had 543 direct estimates on aid-growth impact therefore forming the larger part of their dataset. They concluded that there is proof showing aid not affecting economic growth. Further, they stated - relationship between aid and growth reported in 1970 to 1980 was weaker as compared to 1990s and 2000s, where an improvement was noted.

Ram (2004) examined poverty and economic growth by reviewing the policies of the recipient country policies. He considered the policies to play a key role in foreign aid effectiveness. This study did not agree with the view that is well known on increasing aid in countries that have better policies leading to increased economic growth and reduced poverty rates. The research found lack of proof supporting a notion, increased foreign aid to countries with proper policies will lead to increased economic growth and subsequently reduced poverty.

Metzger (2015) found that evidence of aid influencing economic growth is contigent on the policies of the recipient countries. Aid performs well in countries with proper policy rules. The study outlines that higher level of aid to developing countries removes possibility of social and political institutions being effective and efficient. Moreover, it results in lack of transparent good governance, encourages corruption and reduces the incentive for reform in social and political structure. This was because in a way, the donor country had some overbearing hand in the development policy of the recipient country. More often than not, it leads to a situation of the recipient country being ridden by debt and overly dependent on aid.

The impacts of the sector-specific aid are more unambiguous than those of total aid. Simandan (2009) analyzed the Asian continent to understand foreign aid effect on economic growth. Their findings alluded to the fact that with controlled effect of trade, government intervention and finance effect of aid on economic growth is significant and positive.

Snyder (1987) studied the correlation of foreign aid and GDP growth rate of 69 countries, for 3 periods: 1960, 1970 and in the period 1980 to1987 while also including the size of the country in GDP. He proposed with exclusion of a country size, effects of aid are minimal and insignificant but with inclusion of aid, aid's effect is significant and positive.

Niyonkuru (2016), reviewed aid management policies, then argued that foreign aid might come with a hidden agenda from donors while its inadequacy to get rid of poverty was seen as inherent to aid because it leads to its mismanagement by recipient countries. These failures result to the conclusion that foreign aid exploitations and leads to dependency mindset of recipient countries.

Tekin (2012), studied the correlation of trade openness, foreign aid and economic growth in LDCs between 1970 and 2010. The study found out little proof of any correlation of economic growth and foreign aid.

Herzer and Morrissey (2011) studied whether aid is effective using 59 developing countries for covering 1971 to 2003. This study argued how aid affects a country's GDP is dependent on country-specific opportunity cost. Aid was observed to have negative indirect effect on productivity in totality though it has a direct positive effect with investment financing. The 1st step of this study involved a heterogeneous panel and individual country co-integration techniques while the 2nd one involved an approach of general to specific variable selection. They concluded that in the 1st scenario the coefficients of effectiveness of aid effectiveness were negative but less

than positive effect of investment. The aid effectiveness in the 2nd scenario was found to be justified by the variations in religious tensions, the size of the government and differences in law and order in their impact on productivity.

Uneze (2011), reviewed literature on aid allocation to investigate whether foreign aid affects West African Countries' private investment, with other private investments determinants also taken into account. He used unbalanced panel data for West Africa countries (19 countries) for period 1975-2004. The study utilized random effects and fixed effects estimators to find out whether private investment is influenced differently by multilateral and bilateral aid. The study further investigated how uncertainty of aid affect private investment. Results were that multilateral aid has a positive effect to private investment, but bilateral aid has no effect on private investment. In addition, uncertainty, was seen as coefficient of variation, was found to have unfavorable impact on private investment and thus reducing influence of aid on domestic private investment.

Ojiambo (2014) with time series data used Samuelson model for the period 1966 to 2010 and argued that public investment and economic growth are affected positively by foreign aid. Lagged foreign debt effects influence public investment and economic growth positively for the 1st year while the after years the effect is negative. Empirical findings suggest that public investment and economic growth are positively affected by the flow of aid. Further, they ascertained there is interdependent relationship of the public and private investment. During the study period, Kenya's macroeconomic policy environment was seen unstable and therefore affected public investment and economic growth negatively. Despite Kenya and the development partners committing to predict foreign aid, aid flow was unpredictable and affected public investment and economic growth negatively.

Various studies suggest foreign aid is a veritable means to augment meagre local resources and boosting growth in various sectors in the recipient country. Salisu (2007) noted that some recipients have benefited greatly from foreign inflows, growing to become aid donors themselves like South Korea, China and Singapore whereas countries like Nigeria and Kenya have not grown any of their aid receiving sectors significantly to drive out poverty and grow their economy. Nigeria, for instance, has received varied foreign aid while its socio-economic development has remained low in the period aid was received. There might be varied factors quantitative or qualitative explaining the adverse trend, the underlying point is that it is not all the time that foreign aid lead to planned positive economic and sectoral growth in the recipient countries (Salisu, 2007).

Burnside and Dollar (2000), looked into correlation of growth per capital GDP, foreign aid and economic policy using World Bank data on foreign aid (W. Easterly, 2003). They found out a positive impact of foreign aid on economic growth of developing countries that have favourable trade, monetary and fiscal policies though have minimal effect in countries where there are deficient policies. However, their results were weak and they relied on the datasets used and definitions of 'growth' 'aid' and 'policies' (W. Easterly, 2003; W. Easterly et al., 2003).

According to Reddy and Minoiu (2009), of the 51 countries that were developing in 1960s, a number of 21 countries had little growth after a period of four decades. In addition, in the 1960s and 1970s there was informal evidence from development study that suggest few countries that also performed well were successfully predicted as such while many countries that did poorly were seldom predicted as so. Donors could have concentrated on giving aid to developing countries that have growth-promoting features which include superior human rights record, better institutional environment, or higher concern for pro-poor issuance of aid, the many covariates incorporated in the specifications that are expected to reduce these factors' possible confounding effects.

Ouattara and Strobl (2003), analyzed Cote d'Ivoire in the period 1975 to1999 and found out that aid, in money or sectoral technical assistance can increase public savings while sectoral program aid made worse foreign dependence of Cote d'Ivoire and subsequently leading to stagnant economic growth.

Chenery and Carter (1973), found effect of official development aid on sectoral development growth of Kenya, Iran, Korea and Thailand, was positive whereas in Ghana, India, Chile, Ceylon, Colombia and Tunisia, it led to retarded growth.

However, Gyimah-Brempong (2015) study suggested foreign aid effect to service sector in Ethiopia improved service results and assigning more resources to service sector enhanced the gains from the sector. The division between sectoral and general economy effectiveness of aid has resulted into continuing dispute about aid impact on economic development.

2.4 Overview of the Literature

The impact of aid on a country's economic growth has attracted various theoretical and empirical literatures. There has been different literature that indicate a positive impact of foreign aid such as Metzger (2015), Simandan (2009) and Herzer and Morrissey (2011). Other scholars give evidence that the impact is negative like Doucouliagos and Paldam (2008) and Ram (2004) while other results that show the mixed conclusions depending on various circumstances like policy, time and target sectors like Ouattara and Strobl (2003), Snyder (1987), Uneze (2011) and (Ojiambo, 2014).

Various reviews of the effect of aid on economic growth utilized different models, from the theoretical literature; gap model has clear definition that foreign aid is brought in as capital to bridge savings, fiscal and investment gaps. Through this, growth can be able to take place.

Herzer and Morrissey (2011), argued that cross-country panel growth is affected because cross-country heterogeneity is not accounted for in aid effects; considering the dependent variable to be growth and independent variables being levels; and the endogeneity matter of weak instruments.

This position is aggregated since some variables are established as significant in some studies, are not significant in others.

The cross-country perspective is limited since it is explanatory for a specific country. The parametric invariance assumption across countries makes it impossible to expound results for one country and hence impossible to come up with country-specific policy implications (Uneze, 2011). Due to this consideration, a study that is country-specific is considered important.

CHAPTER THREE: METHODOLOGY

3.1 Theoretical Framework

The theoretical framework was based on the theoretical review conducted in chapter two of the study. Foreign aid in literature is observed to affect growth through three main channels; the savings gap channel, the foreign exchange rate gap channel, and the two-gap channel. According to the savings gap, growth depends on investments (I), which are financed, by savings (S). However, in many developing countries, levels of domestic savings are low; thus, the deficit is financed through foreign aid (A). This implies that:

$$\boldsymbol{I - S = A \equiv A = I - S} \quad \textbf{(1)}$$

On the second channel, of foreign exchange rates, the argument is that developing countries do not have an ability to raise enough foreign exchange through their levels of exports (X). The deficit implies these countries are unable to meet their demand for imports (I). Thus, the deficit is financed through foreign aid, given by:

$$\boldsymbol{M - X = A \equiv A = M - X} \quad \textbf{(2)}$$

The two-gap channel combines the exchange rate gap (equation 2) and the savings gap (equation 1) in terms of national income identity to have:

$$\boldsymbol{E - Y = I - S = M - X = A} \quad \textbf{(3)}$$

Where E is national expenditure and Y is national output, thus $(E - Y)$ is the deficit financed by aid. Thus, based on the standard national income identity given by:

$$\boldsymbol{Y = C + I + G + X - M} \quad \textbf{(4)}$$

It implies that, national income, is function of foreign aid. Specifically:

$$\boldsymbol{Y = f(Aid, Z)} \quad \textbf{(5)}$$

Where aid, would play the roles of either closing the savings gap, the expenditure gap or the foreign exchange rate gap. Z are other control variables identified by literature that affect growth of output in a country. Aid that is for Official Development (ODA) is usually channeled to developing countries under various forms and sectors. For example, Gross ODA aid disbursement for agriculture or Gross ODA aid disbursement for industry are forms of aid channeled specifically for agriculture and industry sectors respectively. Several studies among them Herdt (2010) (Selaya & Thiele (2010) and Mekuria (2014) have used these sectoral data to measure the effect of aid on growth of the specific sectors that receive aid. The measurements of the effects are based on the standard channels of savings gap and foreign exchange rate. Thus, the growth function in equation (5) may be re-written in a sectoral form as:

$$\boldsymbol{S_i = f(Aid_i Z_i)} \quad \textbf{(6)}$$

Where S_i is sector i, Aid_i is foreign aid channeled to sector i, and Z_i are control variables for sector i. In this study, the main sectors analyzed are the agriculture, industry and service sectors. Under the dual economy model, these three sectors are usually interlinked. Specifically, through productivity measures. Explicitly, an increase in labor productivity for example through using advanced technology is anticipated to depict a positive influence on growth of both the agriculture and industry sector. Further, an increase in agricultural productivity would see an increase in industries output. Precisely, the industries, which use materials from agricultural sectors. Thus, considering the inter-linkages, equation (6) may be re-written as:

$$\boldsymbol{S_i = f(Aid_i Z_j), where\ i \neq j} \quad \textbf{(7)}$$

The three sectors analyzed, feed into the countries level of output. Thus, to examine effect of aid on aggregate output in the country, equation (5) may finally be re-written as:

$$\boldsymbol{Y = f(S_i, Aid, Z)} \quad \textbf{(8)}$$

Aid equation (8) encompasses aggregate foreign aid that the country receives. This is composed of aid from the three sectors analyzed together with other forms of aid that the country receives.

3.2 Analytical framework

To analytically measure the effect of aid on specific sectors, equation (7) was log-linearly transformed to:

$$\boldsymbol{\log S_{it} = \alpha_i + \log Aid_{it} + \log Z_{jt} + \epsilon_{it}} \quad \textbf{(9)}$$

Where ϵ is an error term and α is a constant, the t on each variable implies the variables are observed over time t. The equation was estimated for each of the sector. Before estimation, the data was subjected to a stationarity test. The variables on equation (9) were all observed to be stationary, Vector Autoregressive Model (VAR) utilised to estimate the impact of each variable against the other. According to (Sims, 1980) applying a VAR model ensures all the variables are endogenous, one thus, doesn't need to make a distinction between endogenous and exogenous variables during estimations (Verbeek, 2017).

A general VAR model, this involves (p) lags of (q) time series variables, this is usually formulated as:

$$\boldsymbol{Y_t = k + \prod_1 Y_{t-1} + \prod_2 Y_{t-2} + \cdots + \prod_p Y_{t-p} + \mu_t \; ; \; where \; t = 1, \ldots, T} \quad \textbf{(10)}$$

Where the term $Y_t$is a $(q \times 1)$ vector of endogenous variables, k is a vector of constants, $\prod_i$ is a $(q \times q)$ matrix of coefficients and μ_t is a $(q \times 1)$ vector of white noise terms. Importantly, the

VAR model assists to identify the existence of an association between the variables in the short run, however it does not state the direction of the relationship. To get around this, a Granger causality test by Granger (1969) was carried out. The test helps in establishing if one time series variable is useful in terms of estimating another, based on the linear regression model. For this study, Granger causality was expounded from equation (9) for each sector in the form of the following equations:

$$\log S_{it} = \beta_{io} + \sum_{k=1}^{p} \beta_{1i} \log Aid_{i(t-k)} + \sum_{k=1}^{p} \beta_{2j} \log Z_{j(t-k)} + \varepsilon_{it} \quad (11)$$

$$\log Aid_{it} = \alpha_{io} + \sum_{k=1}^{p} \alpha_{1ik} \log S_{i(t-k)} + \sum_{k=1}^{p} \alpha_{1ij} \log Z_{i(t-k)} + \varepsilon_{it} \quad (12)$$

Thus, causality runs from output of sector I to aid if $\beta_{1i} \neq 0$ and from aid to output of sector I if $\alpha_{1ik} \neq 0$. If the two conditions do not hold for a sector, then it implies there is no dependent feedback association between output of a sector I and foreign aid channeled to this sector. In each of the equations (11 and 12), p are the number of lags.

To determine effect of aggregate foreign aid on Kenya's GDP, equation (8) was log-linearized to the form:

$$Y_t = Agr_t + Ind_t + Ser_t + Exp_t + GCF_t + \log Aid_t + \log labor_t + \varepsilon_t \quad (13)$$

Not all these variables were converted into logarithm since some were in percentages. Specifically, Y_t is GDP growth rate (%), Agr_t is Agriculture value added as a percentage of GDP, Ind_t is industry value added as a percentage of GDP, Ser_t is service value added as a percentage of GDP, Exp_t is exports as a percentage of GDP, and GCF_t is Gross capital formation as a percentage of GDP. However, foreign aid Aid_t and labor $labor_t$ variables were converted to their natural logarithm and interpreted as percentages. Finally, ε_t is the error term. These variables were subjected to stationarity and cointegration tests. They were found to be cointegrated (having a long

run association) and thus a Vector Error Correction (VECM) model was used to estimate their relationship.

The variables used were in two forms: Valued added in millions of Kenya shillings and Value added as a percentage of GDP. In analyzing the effect of foreign aid at the sector level, data of valued added in millions was used, while in examining the aggregate aid impact on GDP growth, value added as a percentage GDP was used. Definition and measurement of each variable are shown on table 2 below:

Table 2: Definition of Variables, their measurement

Variable	**Definition**	**Measurement**
Sector Variables	Agriculture (Agr)	Agriculture, value added in US$ and transformed to natural logarithm.
	Industry (Ind)	Industry, value added in US$ and transformed to natural logarithm.
	Service (Ser)	Service, value added in US$ and transformed to natural logarithm.
	Aid	Aid for each sector measured in current US$ transformed to natural logarithm.
GDP	GDP (Y)	GDP annual growth (%)
	Agriculture (Agr)	Agriculture value added (% of GDP)
	Industry (Ind)	Industry value added (% of GDP)
	Service (Ser)	Service value added (% of GDP)
	Exports (Exp)	Exports value added (% of GDP)
	Gross capital formation (GCF)	Gross capital formation value added (% of GDP)
	Labor	Labor in US$ and transformed to natural logarithm.
	Total Aid	Total Aid in current US$ and transformed to natural logarithm.

Source: African Development Indicators (World Bank 1981-2018)

3.4 Diagnostic Tests

The methodology to analyze the relationship between variables involved making use of time series data. Various econometric measures were conducted on the data to verify whether the variables had a long or short run association.

3.4.1 Stationarity test

Time series data usually have unit roots or is non-stationary in nature. Since a non-stationary series has several unit roots, integrated of the order:

d [l(d) and d is 1, 2, ...]

Stationary series integrated of the order 0 [1(0)].

The distinction of stationary and non-stationary time series is in response to shocks; stationary time series shocks are temporary and their effects disappear with time leading to the series going back to long-term level of equilibrium. Stationary series forecasts will converge at its mean. However, the effects of shocks to nonstationary series persist for some time because mean of a nonstationary series and its variance dependent on time. Because there is no stationarity, the regressions of time series data lead to spurious results. Therefore, this study used Augmented Dickey-Fuller (ADF) to examine for the existence of unit roots.

In the event the time series are established to be stationary, then a short run analysis can be conducted. However, if they are non-stationary, it calls for testing for cointegration. Among the variables used in the study, some variables were observed to be stationary while others were non. For the ones that were non-stationary, a cointegration analysis was conducted.

3.4.2 Co-integration

Co-integration is mostly connected with economic theories; the theories suggest there exists an equilibrium relationship of time series variables. The models for growth theory suggest co-integration between investment, consumption and income, the common trend being productivity.

The importance of co-integrating relationship is that variables have a common unit root process. Such a process is crucial here since it gives a flexible functional form for modelling the behaviour of variables under the state of long run equilibrium. The approach is agreeable since it considers

endogenous variables; this avoids random option of dependent variables in co-integrating equations.

Johansen multivariate co-integration test is to determine whether one modeling empirically is relevant with a relationship that is long run, trace and maximum Eigen value were considered.

3.5 Data Type and Sources

This study utilizes secondary time series yearly data covering the period 1981 to 2018. Data was sourced from World Bank Statistics, under the category of African Development Indicators.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter show results from estimation of the models in chapter three of the study. The first part of the findings highlights the descriptive statistics of the data while the second part discusses the inference statistics of the data.

4.2 Descriptive Statistics

Descriptive statistics generally provide a picture of the data under study. The raw variables used in the models of agriculture, industry and service were converted into their natural logarithm in order to discuss them as elasticities. The variables in these models were in terms of millions of Kenya shillings. For the model of GDP, most of the variables except labor and foreign aid, were in terms of percentages, thus, they were not converted to natural logarithms. One important feature of logged variables is that they are scaled down and their distributions tend to approach a normal distribution. The general results of summary statistics are highlighted on table 3.

Table 3: Summary Statistics

	No. of Obsv.	Mean	SD	Minimum	Maximum
Log Agriculture value added	38	21.98205	0.530388	21.15631	22.8451
Log Aid to Agriculture	38	17.14351	1.42067	13.80844	19.2538
Log industry value added	38	21.49723	0.590373	20.53254	22.3931
Log Aid to industry	38	15.2064	1.22628	12.83852	17.21759
Log Service value added	38	22.53942	0.638147	21.60789	23.48776
Log Aid to Service	38	19.56923	1.457982	16.077	21.69373
GDP (% growth)	38	3.153721	2.039795	-0.79949	7.177556
Agriculture VA (% of GDP)	38	29.39347	2.851312	25.0112	34.21954
Industry VA (% of GDP)	38	18.21155	0.991012	16.01757	20.27525
Service VA (% of GDP)	38	52.37355	3.060067	46.4088	56.9982
Fixed capital formation (% of GDP)	38	19.13598	3.062952	15.00382	25.44904
Exports (% of GDP)	38	23.69385	5.433522	13.17414	38.90363
Log labor	38	16.16555	0.475862	15.1021	16.7466
Log Total Foreign Aid	38	19.99394	1.432895	16.844	22.1074

The study used 38 observations, ranging from 1981 to 2018. For each of the variables, the standard deviations were relatively small as compared to the respective mean. This shows that most of the values were close to the mean. An implication that the variables are mostly highly spread around the mean. The maximum and minimum values for each variable are seen to be close to each other, confirming the closenees of the data series to their mean values. The largest gap values is observed on GDP annual growth. Generally for the period under study, annual GDP growth rate was observed to be around 3%. The mean values shows that the largest contributer to GDP is the service sector, with a mean of 52%. Agriculture is second largest contributer at 29% then followed by exports at 23%.

A correlation analysis was conducted on all the variables. The group of variables value added on agriculture, industry and service were observed separately from other variables. The reason of conducting this segregation was to observe the correlation of the respective foreign aid proportion to a sector and the sector's value addition. The first six rows of table 4 highlight the correlation coefficients between the sector variables and their respective foreign aid proportions. The subsequent rows are the correlation coefficients for other variables.

Beginning with agriculture, the proportion of foreign aid that goes to agriculture has a positive and significant correlation (0.630) with agriculture value addition. This shows that, as aid to agriculture increases, value added in agriculture also increases. The same pattern is observed in the industry sector, with a coefficient of 0.683 and in service with a coefficient of 0.620. However, in all these scenarios the magnitude of the correlation is moderate (less than 0.7). There is a strong and positive correlation between industry and agriculture, service and agriculture and, industry and services. The correlation coefficients between these sectors are close to one, an indicator that as one of the sector's value addition increases, the subsequent value addition for the sectors also increases.

Table 4: Correlation Matrix

	Ln Agric	Ln Aid-Agric	Ln ind	Ln Aid-ind	Ln Serv	ln Aid-Serv
Ln Agric	1					
Ln Aid-Agric	**0.630*** **	1				
Ln Ind	0.989***	0.683***	1			
Ln Aid-ind	0.640***	0.937***	**0.683*** **	1		
Ln Serv	0.992***	0.647***	0.994***	0.642***	1	
Ln Aid-Serv	0.603***	0.985***	0.658***	0.917***	**0.620*** **	1

Notes: All the variables above are in natural logarithm; their raw values were in Kenya million shillings.

	Gdp	Agri	Ind	Serv	Man	Sav	Gcf	Exp	Labor	Aid
Gdp	1									
Agri	-0.0790	1								
Ind	0.235	0.0754	1							
Serv	0.00149	-0.948***	-0.389*	1						
Gcf	0.475**	0.350*	0.564***	-0.503**	0.0301	0.180	1			
Exp	0.0162	0.571***	0.0990	-0.555***	-0.249	0.683***	0.264	1		
Labor	-0.260	-0.714***	-0.525***	0.827***	-0.223	-0.265	-0.753***	-0.411*	1	
Aid	0.0883	-0.737***	0.150	0.629***	-0.0837	-0.309	-0.0837	-0.463**	0.432**	1

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Gdp is GDP (annual % growth), Agri is Agriculture value added as a % of GDP, Ind is industry value added as a % of GDP, Serv is service value added as a % of GDP, Gcf is Gross fixed capital formation as a % of GDP, Exp is exports as a % of GDP, Labor is natural logarithm of labor and Aid is natural logarithm of foreign aid.

For the other variables, the main interest of the study was to observe the correlation of the variables in comparison with GDP annual growth. Gross fixed capital formation, the proxy for investment was the variable that was positively and significantly correlated with GDP annual growth. This shows that as investments increased, GDP also increased over the period of study. The main independent variable, foreign aid, was not correlated with annual GDP growth in the country for the period under study.

4.3 Diagnostic tests (pre-estimation tests)

Inferential statistics involves making an inference about the relationship of the variables. The variables under study were all time series variables. Thus, the first step was to check whether they have a constant mean and variance over time. Specifically, to check whether they have a unit root or not.

4.3.1 Unit root test

An Augmented Dickey Fuller (ADF) test carried out was to find out whether the variables were stationary or not. The null hypothesis is that the series has a unit root (non-stationary). In interpretating the ADF test results, the absolute statistic of calculated ADF is compared with the critical statistic. In the event the calculated absolute value is found to be less than the critical value then the null hypothesis of presence of a unit root cannot be rejected, otherwise the null can be rejected. The outcome of unit root tests are presented on table 5.

Table 5: Augmented Dickey Fuller test

	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Ln Agriculture value added	-0.63	-3.668	-2.966	-2.616
1st difference	-5.816	-3.675	-2.969	-2.617
Ln Aid-Agriculture	-0.454	-3.668	-2.966	-2.616
1st difference	-4.015	-3.675	-2.969	-2.617
Ln Industry value added	-0.639	-3.668	-2.966	-2.616
1st difference	-4.814	-3.675	-2.969	-2.617
Ln Aid-Industry	-0.723	-3.668	-2.966	-2.616
1st difference	-9.759	-3.675	-2.969	-2.617
Ln Service value added	-0.715	-3.668	-2.966	-2.616
1st difference	-4.443	-3.675	-2.969	-2.617
Ln Aid-Service	-0.744	-3.668	-2.966	-2.616
1st difference	-5.018	-3.675	-2.969	-2.617
GDP (% annual growth)	-3.349	-3.668	-2.966	-2.616
Agriculture (% of GDP)	-1.237	-3.668	-2.966	-2.616
1st Difference Agriculture	-6.602	-3.675	-2.969	-2.617
Industry (% of GDP)	-2.93	-3.668	-2.966	-2.616
1st Difference Industry	-7.669	-3.675	-2.969	-2.617
Service (% of GDP)	-1.338	-3.668	-2.966	-2.616
1st Difference Service	-8.959	-3.675	-2.969	-2.617
Exports (% of GDP)	-1.533	-3.668	-2.966	-2.616
1st Difference Exports	-5.437	-3.675	-2.969	-2.617
GCF (% of GDP)	-2.415	-3.668	-2.966	-2.616
1st Difference GCF	-7.555	-3.675	-2.969	-2.617
Ln Labor	-0.853	-3.668	-2.966	-2.616
1st Difference Ln Labor	-6.037	-3.675	-2.969	-2.617
Ln Aid	-0.532	-3.668	-2.966	-2.616
1st Difference Aid	-4.446	-3.675	-2.969	-2.617

The results show that all the variables, expect GDP (% annual growth), have a unit root (non-stationary) in their levels. This was because their absolute statistics of the calculated ADF were

less than the critical values at 1%, 5% and 10% confidence intervals. However their first differences were all stationary since all the absoulte caclulated ADF values were greater than the critical values at all the confidence intervals.

The variables were non-stationary on levels but stationary at first difference implying that they have integration of order one I(1). Subsequently, because the variables are integrated a test for cointegration was done. The co-intergration test conducted wa to verify presence of a linear combination among the variables.

4.3.2 Johansen test of cointegration

The variables were observed as non-stationary in their level forms, however their first differences were I (0). In such cases, there were signs of a presence of stochastic trends among the variables, thus warranting to test the presence of a long run association. This long run association was tested using the Johansen multivariate cointegration test (Johansen & Juselius, 1990). Johansen test of cointegration base on Johansen 1988, tests the number of cointegrating relatiosnhips (k) that exists between between the non-stationary variables. For one to determine the number of cointegrating equations, the hypothesis would be H_0: k=0 against the alternative H_1:k=1. In the event the trace statistic be smaller than critical value, accept H_0 and vice versa. The results for the Johansen Test are highlighted on appendix 1. For the models of agriculture, industry and service, the null hypothesis is accepted at the 0 rank implying there is no cointegration among the variables, this implied the variables do not have a long-run relationship. Subsequently, with no long-run relationship it is ideal to model the variables under a short-run framework. The ideal short run framework is the Vector Autoregressive Model (VAR) model. For the GDP model the null hypothesis is accepted at the rank of 7 implying there are seven cointegrating equations. These

implies there is a long run association between these variables. Thus the model for GDP will be estimated using a Vector Error Correction Model (VECM).

4.4 Vector Autoregressive Model (VAR)

Under the VAR model, the dependent and independent variables are considered as endogenous variables. Thus, each of the variables will be a dependent variable on its own model. The results of the VAR results for each sector are shown on table 6. The VAR model was estimated with three lags. In the first model, agriculture is the dependent variables, in the second, industry is the dependent variable and finally in the third model, service is the dependent variable. The variable that differs on each model is the foreign aid variable. In the first model, foreign aid, is the proportion of foreign allocated to agriculture sector, in the second model, foreign aid is foreign aid proportion channeled to industry sector and finally foreign aid in the third model, is the proportion of total aid that goes to the service sector. The results from VAR model are shown on table 6. The reported results are the beta coefficients from each model.

Table 6: Effects of Foreign aid on growth of various sectors (VAR coefficients)

VARIABLES	Ln agriculture	Ln industry	Ln service
L. ln agriculture value added	0.360	-0.423	-0.193
	(0.346)	(0.378)	(0.355)
L2. ln agriculture value added	1.338***	1.499***	1.388***
	(0.368)	(0.424)	(0.384)
L3. ln agriculture value added	-0.886**	-0.900**	-1.130***
	(0.380)	(0.404)	(0.393)
L. ln industry value added	0.016	0.413	0.521
	(0.417)	(0.488)	(0.431)
L2. ln industry value added	-0.943**	-0.635	-0.818**
	(0.385)	(0.457)	(0.405)
L3. ln industry value added	-0.150	-0.228	-0.541
	(0.384)	(0.465)	(0.406)
L. ln service value added	0.568	1.101**	0.818*
	(0.480)	(0.520)	(0.490)
L2. ln service value added	-0.308	-0.852	-0.734
	(0.473)	(0.549)	(0.491)
L3. ln service value added	0.791*	0.826	1.517***
	(0.445)	(0.513)	(0.459)
L. ln Aid	0.042	0.064	0.062*

	(0.041)	(0.046)	(0.033)
L2. ln Aid	0.004	0.029	-0.013
	(0.059)	(0.043)	(0.044)
L3. ln Aid	-0.002	-0.038	-0.018
	(0.041)	(0.045)	(0.032)
Constant	2.871**	2.227*	2.448**
	(1.124)	(1.338)	(1.157)
Observations	35	35	35
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1			

Table 6 shows that the second lag of agriculture has a positive influence on growth of agriculture, industry and service sectors in the country. However the the third lag is negative implying that over time, growth in agriculture sector exerts a negative pressure on industries and service sectors of the country. In model 1, lag of industry is observed to have a negative effect on agriculture growth while service has a positive effect. This shows that over time, in the country, service sector exerts a positive influence on agricultural growth in the country. The portion of foreign aid that is channelled to the agriculture sector does not have a significant growth in the sector as seen on model one.

Model 2 shows that the service sector has a positive and statistically significant effect on growth of the industry sector in the country. The proportion of foreign aid that goes to the industry sector does however not have a significant effect on the growth of this sector. The third model shows that the lag of industry has a negative effect on service sector. Lags of service sectors have a positive and signficant effect on growth of service sector in the country. This shows that investment on service sector in one particular period have a signiciant positive effect on growth of the sector in subsequent periods. Finally, foreign aid coefficient is positive and is statistically significant in third model implying the portion of foreign aid that is channeled to service sector has positive effect on the growth of this sector in the country.

4.5 Vector Error Correction Model (VECM)

Johansen test of cointegration showed that there were two cointegrating equations amongs the variables. Thus a VECM model was estimated using two ranks. The VECM reports both the long-run and short-run results. Short-run results are the lagged differences reported on table 7. The long run results are the Johansen normalization restrictions highlighted on appendix 5. In each of the long run models, the signs of the variables are reversed when reporting. The variables *L._ce1* report the speed of adjustments. The magnitude of the coefficients needs to be negative and less than one. For the first model of GDP, the value negative, less than one and significant. This shows that in the long run, GDP adjusts to its long run equilibrium at a speed of 76.9%. In the second model of Agriculture, the speed of adjustment is 0.293, indicating that in the long run, agriculture adjusts to its value of equilibrium at a speed of 29.3%. For gross fixed capital formation, the speed is 44.9%. The other variables are either not less than one or insignificant, implying they not adjust to their long run equilibrium rates. The aspect of adjusting to equilibrium entails a response to shocks in the future. Thus, when GDP, agriculture and GCF face economic shocks, they adjust back to their levels of equilibrium at the speed of 77%, 30% and 50% respectively. The beta coefficients from the VECM model are reported on table 7 below.

Table 7: Short run effects of foreign aid on Annual GDP growth in Kenya (VECM coefficients)

VARIABLES	D_ GDP	D_ Agric	D_Ind	D_Serv	D_Exp	D_Gcf	D_Ln labor
L._ce1	-0.769***	-0.293*	0.179**	0.108	-1.227***	-0.449*	-0.006
	(0.207)	(0.161)	(0.073)	(0.143)	(0.380)	(0.254)	(0.023)
LD. GDP	0.155	0.030	-0.149**	0.124	0.689*	0.080	-0.002
	(0.203)	(0.158)	(0.071)	(0.140)	(0.373)	(0.250)	(0.022)
LD. Agriculture	-37.690*	4.883	9.914	-14.816	-19.923	6.601	-0.142
	(21.001)	(16.322)	(7.374)	(14.520)	(38.601)	(25.850)	(2.292)
LD. Industry	-37.688*	5.140	10.036	-15.189	-20.936	7.852	-0.190
	(21.067)	(16.374)	(7.397)	(14.566)	(38.723)	(25.932)	(2.299)
LD. Service	-37.953*	5.197	10.295	-15.507	-20.194	6.665	-0.152
	(21.116)	(16.412)	(7.414)	(14.599)	(38.812)	(25.991)	(2.304)
LD. Ln Aid	0.070	-0.774	-0.341	1.108**	0.383	-1.732*	0.018
	(0.749)	(0.582)	(0.263)	(0.518)	(1.376)	(0.921)	(0.082)
LD. Exports	-0.070	0.080	0.050	-0.131*	-0.200	0.126	0.001

	(0.102)	(0.080)	(0.036)	(0.071)	(0.188)	(0.126)	(0.011)
LD. GCF	0.590***	-0.066	0.043	0.023	0.148	-0.107	-0.004
	(0.156)	(0.121)	(0.055)	(0.108)	(0.287)	(0.192)	(0.017)
LD. Ln labor	1.281	-0.417	1.106	-0.679	4.035	0.662	-0.104
	(2.190)	(1.702)	(0.769)	(1.514)	(4.025)	(2.695)	(0.239)
Constant	0.184	-0.086	-0.225**	0.308	-0.120	0.063	0.037
	(0.298)	(0.231)	(0.105)	(0.206)	(0.547)	(0.366)	(0.032)
Observations	36	36	36	36	36	36	36
Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1							

The lagged variables explain the short run dynamics. Thus, as seen on table 7, the first model of GDP shows that agriculture, industry and service all as a percentage of GDP have a negative and significant effect on GDP in the short run. However in the long run, as seen on appendix 4, industy and service have a long run positive effect on annul GDP growth rate in the country. The magnitude shows that in the long run, for the period under study, industry has contributed more to the growth of GDP compared to the service sector. The coefficient for Gross fixed capital formation is positive and significant in the GDP model. This shows that in the short run, investments contribute positively to the country's GDP growth. However, the effect is negative in the long-run.

For the other models, GDP is observed to have a short run negative impact on industry as seen on column three of table 7, however it a positive effect on service sector as seen on column five. Foreign aid is observed to exert an upward short run positive pressure on the service sector in the country. However, it has a short run negative effect on gross fixed capital formation in the country.

4.6 Diagnostic tests (post estimation tests)

Diagnostic tests were conducted for both the VAR and VECM models estimated. The first test was the Granger causality test for the VAR model, followed by autocorrelation test and finally the normality test.

4.6.1 Granger Causality test

Causality analysis is conducted for the sector variables in the VAR model in table 5 to check whether the variables granger cause each other. Granger causality Wald tests are estimated for each of the models and the results are presented on appendix 3. The results for the three models; agriculture, industry and service, presented in table 12, 13 and 14 respectively are differentiated by foreign aid variable. Specifically, aid in table 12 is the proportion of aid that goes to agriculture sector, aid in table 13 is proportion that goes to industry and aid in table 14 is proportion of aid that goes to service sector. In all these models, the variable aid does not granger cause these economic sectors. However, the respective sectors granger cause each other. Particularly, table 12 shows that agriculture granger causes industry and service. This is because the p values of each of these variables is less than 0.10 level of significance. The same pattern is observed on second row of table 13 and 14. In terms of industry and services, table 12 shows that industry and service granger cause each other. Specifically, industry granger causes service and service granger causes industry. Similar patterns are observed on table 13 and 14. Finally, the results show that both industry and services do not granger cause agriculture.

4.6.2 Autocorrelation

The test was carried out to establish whether the error terms were serially correlated. A Breusch–Godfrey test which is also called the Langrage-Multiplier test was conducted. The hypotheses of the test are:

H_0: No Serial Correlation

H_1: Serial Correlation

The results from the tests are shown on appendix 5. In each of VAR models (table 16, 17 and 18), the chi^2 statistics of the first and second lags were both not statistically significant. Thus, the null hypothesis could not be rejected, an implication that there was no autocorrelation at lag orders.

Thus, all the error terms were not serially correlated and hence this showed that the models were well specified. For the VECM model in table 19 , the null hypothesis could be rejected at the first lag, however it could not on the second lag.

4.6.3 Normality test

Errors were tested if they normally distributed for each model. A Jarque Bera test was conducted. The hypothesis for the test are:

H_0: Data is from normal distribution

H_1: Data is not from a normal distribution

Results for this test are highlighted in appendix 6. Interpretation of the results is usually done on the first model of each of the equation. Thus, for agriculture, table 20 shows that the Chi2 of the first model of agriculture is 2.168. Its p value is greater than 0.05, thus the null hypothesis cannot be rejected. Indicating that the error terms of agriculture model were normally distributed. For industry, service and GDP models, tables 21, 22 and 23 shows that the p value was less than 0.05, thus the null hypothesis was rejected. An implication that error terms were not normally distributed.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter highlights the conclusion derived from the study. Specifically highlighting what the study was about and respective findings. The last section provides brief policy recommendations in tandem to the findings obtained.

5.2 Summary of the findings

The effects of foreign aid on economic growth was analyzed with two forms. The first form observed foreign aid on sectoral level, while second one observed foreign aid at aggregate level. At the sectoral level, proportion of aid that goes to agricultural sector, industry sector and service sector was observed against the respective value addition of these sectors. As a form of diagnostic test, these values were tested for stationarity. All of them were observed to be stationary at their levels. Thus, a VAR model was used to estimate their effects on each other. It was generally observed foreign aid has got significant and positive effect on the growth of the service sector in the country. However, aid does not significantly influence growth of agriculture and industry sectors in the country.

At the aggregate level, service, agriculture and industry sectors were observed in terms of their % proportion to GDP. Specifically, value added for the various sectors as a percentage of GDP; these sectors are agriculture, industry and service. In terms of foreign aid, foreign aid was observed as the aggregate aid that the country has been receiving over the study period. In estimating the aggregate foreign aid impact in country's GDP growth, labor together with gross fixed capital formation and exports as a % of GDP were included as control variables. Diagnostic test showed all the variables were non-stationary in their levels except GDP. The first differences were however stationary, confirming they were all integrated of order 1. Thus, they were subjected to a test of

cointegration. They were observed to cointegrate at order 2. Due to cointegration, their association was estimated using a VECM model.

The VECM showed that GDP adjusts to its long-run equilibrium at speed of 76.9%, agriculture adjusts at a speed of 29.3% while gross fixed capital formation adjusts at a speed of 44.9%. It was observed that agriculture, industry and service all as a percentage of GDP have a negative and significant effect on GDP in short-run. However, in the long run, industy and service depict long-run positive effect on annul GDP growth rate in the country. Gross fixed capital (investments) formation in the short run, contribute positively to the growth of GDP in the country, the effect is however negative in the long run. Foreign aid, the main independent variable of interest is observed to have no significant effect on GDP growth, both in the short-run and long-run. However, it is seen to exert an upward short run positive pressure on the service sector in the country

5.3 Conclusion

The objective of this study was to establish impact foreign aid on the growth of key sectors of the Kenya's economy. The main sectors under study were industry, agricultural and service sectors. Data was observed from 1981 to 2018. The analysis was conducted at the sectoral and macro levels. The sectoral level analysis was adopted because of the availability of foreign aid data at the sectoral level. Specifically, the availability of data on aid that goes to agricultural, industry and service sector, enhanced a sectoral analysis of effect of aid on the growth of specific sectors in the country. Further, due to availability of data on aggregate foreign aid that accrues to the country, a macro level approach was also followed to determine overall effect of foreign aid on growth of GDP in the country.

The results for sectoral level showed that, foreign aid has positive and statistically significant effect

on service sector of the country. The effect was however not significant for the agriculture and industry sectors. In terms of the interdependence of the sectors, it was observed that agriculture granger causes industry and service. However, industry and service do not granger cause agriculture sector. There was a bi-directional relationship between service and industry sectors, where industry granger cause service sector and service granger cause industry sector.

At the aggregate level, agriculture, industry and service all as a percentage of GDP have a negative and significant impact on GDP in the short run. However in the long run, industy and service have long-run positive effect on country's annual GDP growth rate. The gross fixed capital generation in the short-run, contribute positively to GDP growth in the country. Finally foreign aid was observed that it has no significant effect on the growth of GDP, both in the short-run and long-run. However, it is observed to have a significant positive effect on the growth of the service sector.

5.4 Recommendations

The study has shown that increments in the foreign aid proportion on the service sector has significant and positive effect on its growth. Thus, to facilitate more growth of the economy, the country needs to increase the proportion of aid that is channeled to this sector. The increments will see a further increase in output which will be reflected in GDP growth. This is so because the statistics in table 2 show that there is a positive association between the service sector and GDP growth in the country.

The formation of Gross fixed capital has been observed to positively influence GDP growth in the country. Thus, there is a need to increase the levels of investments in the country as they positively impact on GDP growth. Industry and Service sectors have been observed to have positive and significant long-run association with growth in GDP. Thus, there is a need to increase the levels of investments that are channeled to these sectors. Some of the areas where the country needs to

increase the proportion of aid is on the ICT and Tourism sectors. These sectors have recently proven to contribute highly on growth of GDP. A lot of young people are embracing ICT in their activities, which end up contributing to more growth. Further, tourism has greatly been affected by Covid-19, thus channeling more aid to this sector would highly increase its growth and in turn growth in GDP levels.

APPENDICES

APPENDIX 1: JOHANSEN TEST OF COINTEGRATION

Table 8 : Agriculture model

Johansen tests for cointegration

Trend: constant — Number of obs = 36

Sample: 1983 - 2018 — Lags = 2

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	20	122.43085	.	35.7054*	47.21
1	27	131.39771	0.39235	17.7717	29.68
2	32	136.2238	0.23518	8.1195	15.41
3	35	139.55932	0.16915	1.4484	3.76
4	36	140.28354	0.03944		

Table 9 : Industry Model

Johansen tests for cointegration

Trend: constant — Number of obs = 36

Sample: 1983 - 2018 — Lags = 2

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	20	121.15946	.	29.2783*	47.21
1	27	127.82237	0.30938	15.9525	29.68
2	32	133.21421	0.25885	5.1688	15.41
3	35	135.67247	0.12765	0.2523	3.76
4	36	135.79863	0.00698		

Table 10 : Service model

Johansen tests for cointegration

Trend: constant — Number of obs = 36
Sample: 1983 - 2018 — Lags = 2

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	20	112.97425	.	33.0271*	47.21
1	27	121.59811	0.38066	15.7794	29.68
2	32	126.00207	0.21703	6.9715	15.41
3	35	128.84564	0.14613	1.2843	3.76
4	36	129.4878	0.03505		

Table 11 : GDP Model

Johansen tests for cointegration

Trend: constant — Number of obs = 36
Sample: 1983 - 2018 — Lags = 2

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	72	-196.46601	.	219.1065	156.00
1	87	-154.64416	0.90206	135.4628	124.24
2	100	-124.59656	0.81162	75.3676*	94.15
3	111	-108.78191	0.58463	43.7383	68.52
4	120	-100.51295	0.36833	27.2004	47.21
5	127	-94.419412	0.28718	15.0133	29.68
6	132	-89.951481	0.21981	6.0775	15.41
7	135	-86.929572	0.15455	0.0336	3.76
8	136	-86.912747	0.00093		

APPENDIX 2: GRANGER CAUSALITY WALD TESTS

Table 12 : Agriculture Model

Equation	Excluded	chi2	df	Prob > chi2
lnagric	lnind	3.9237	1	0.048
lnagric	lnserv	6.8098	1	0.009
lnagric	lnodaagr	.79423	1	0.373
lnagric	ALL	6.9092	3	0.075
lnind	lnagric	.01083	1	0.917
lnind	lnserv	6.6906	1	0.010
lnind	lnodaagr	1.5346	1	0.215
lnind	ALL	8.7085	3	0.033
lnserv	lnagric	.00116	1	0.973
lnserv	lnind	3.194	1	0.074
lnserv	lnodaagr	.48787	1	0.485
lnserv	ALL	3.5461	3	0.315
lnodaagr	lnagric	.00556	1	0.941
lnodaagr	lnind	.21617	1	0.642
lnodaagr	lnserv	.07194	1	0.789
lnodaagr	ALL	3.8809	3	0.275

Table 13 : Industry model

Equation	Excluded	chi2	df	Prob > chi2
lnind	lnagric	.02744	1	0.868
lnind	lnserv	5.9038	1	0.015
lnind	lnodaind	.47934	1	0.489
lnind	ALL	7.4568	3	0.059
lnagric	lnind	2.9667	1	0.085
lnagric	lnserv	6.0121	1	0.014
lnagric	lnodaind	.19719	1	0.657
lnagric	ALL	6.2156	3	0.102
lnserv	lnind	2.3303	1	0.127
lnserv	lnagric	.01887	1	0.891
lnserv	lnodaind	.05925	1	0.808
lnserv	ALL	3.0825	3	0.379
lnodaind	lnind	.15735	1	0.692
lnodaind	lnagric	.37586	1	0.540
lnodaind	lnserv	.08959	1	0.765
lnodaind	ALL	5.1987	3	0.158

Table 14 : Service Model

Equation	Excluded	chi2	df	Prob > chi2
lnserv	lnagric	.00072	1	0.979
lnserv	lnind	3.1587	1	0.076
lnserv	lnodaserv	.46131	1	0.497
lnserv	ALL	3.5174	3	0.319
lnagric	lnserv	7.0111	1	0.008
lnagric	lnind	4.214	1	0.040
lnagric	lnodaserv	1.0351	1	0.309
lnagric	ALL	7.1891	3	0.066
lnind	lnserv	6.7154	1	0.010
lnind	lnagric	.01039	1	0.919
lnind	lnodaserv	1.546	1	0.214
lnind	ALL	8.722	3	0.033
lnodaserv	lnserv	.01181	1	0.913
lnodaserv	lnagric	.29163	1	0.589
lnodaserv	lnind	.59447	1	0.441
lnodaserv	ALL	4.2188	3	0.239

APPENDIX 3: JOHANSEN NORMALIZATION RESTRICTIONS IMPOSED

Table 15 : Johansen Normalization Restrictions Imposed

Johansen normalization restrictions imposed

beta	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_ce1						
gdp	1	.	.	.	.	.
agri	0	(omitted)				
ind	-2.173554	.2647961	-8.21	0.000	-2.692545	-1.654564
serv	-1.004273	.1314142	-7.64	0.000	-1.26184	-.7467061
lnodatot	1.322759	.1947126	6.79	0.000	.9411292	1.704389
exp	-.0077589	.0338642	-0.23	0.819	-.0741314	.0586136
gcf	.1145743	.1070398	1.07	0.284	-.0952198	.3243684
lnlabor	4.033727	.9417502	4.28	0.000	2.187931	5.879524
_cons	-4.158341	.	.	.	.	.
_ce2						
gdp	0	(omitted)				
agri	1	.	.	.	.	.
ind	.9440777	.0039512	238.93	0.000	.9363334	.9518219
serv	.9926027	.0019609	506.19	0.000	.9887594	.9964461
lnodatot	.0525262	.0029055	18.08	0.000	.0468316	.0582208
exp	-.0020789	.0005053	-4.11	0.000	-.0030693	-.0010886
gcf	-.0120039	.0015972	-7.52	0.000	-.0151344	-.0088735
lnlabor	-.0864834	.0140526	-6.15	0.000	-.1140259	-.0589409
_cons	-97.94314	.	.	.	.	.

APPENDIX 4: AUTOCORRELATION

Table 16 : Agriculture model

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	11.2298	16	0.79508
2	18.2684	16	0.30841
3	9.5248	16	0.89024

H0: no autocorrelation at lag order

Table 17 : Industry model

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	20.8043	16	0.18616
2	13.7222	16	0.61940
3	17.4095	16	0.35959

H0: no autocorrelation at lag order

Table 18 : Service Model

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	11.1942	16	0.79734
2	17.0543	16	0.38209
3	11.1762	16	0.79848

H0: no autocorrelation at lag order

Table 19 : GDP model

Lagrange-multiplier test

lag	chi2	df	Prob > chi2
1	94.8809	64	0.00733
2	71.5848	64	0.24071

H0: no autocorrelation at lag order

APPENDIX 5: NORMALITY TEST

Table 20 : Agriculture Model

Jarque-Bera test

Equation	chi2	df	Prob > chi2
lnagric	2.168	2	0.33830
lnind	1.717	2	0.42377
lnserv	1.323	2	0.51617
lnodaagr	5.803	2	0.05494
ALL	11.010	8	0.20111

Table 21 : Industry Model

Jarque-Bera test

Equation	chi2	df	Prob > chi2
lnind	32.945	2	0.00000
lnagric	1.194	2	0.55042
lnserv	0.003	2	0.99854
lnodaind	1.256	2	0.53368
ALL	35.398	8	0.00002

Table 22 : Service Model

Jarque-Bera test

Equation	chi2	df	Prob > chi2
lnserv	14.460	2	0.00072
lnagric	0.157	2	0.92446
lnind	2.253	2	0.32411
lnodaserv	94.658	2	0.00000
ALL	111.528	8	0.00000

Table 23: GDP model

Jarque-Bera test

Equation	chi2	df	Prob > chi2
D_gdp	14.999	2	0.00055
D_agri	0.378	2	0.82792
D_ind	3.515	2	0.17245
D_serv	0.665	2	0.71705
D_lnodatot	5.463	2	0.06511
D_exp	7.782	2	0.02042
D_gcf	0.070	2	0.96582
D_lnlabor	123.196	2	0.00000
ALL	156.069	16	0.00000

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