

THE EFFECT OF PUBLIC DEBT ON ECONOMIC GROWTH IN KENYA

BY

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DECLARATION

I declare that this research project is my original work and has not been previously published or submitted in any other university for an academic award or purpose. I also declare that no material herein that has been written or published from other authors or researchers except where the author or researcher is duly acknowledged.

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ABSTRACT

Public debt is a critical component in economic development in any country. Its servicing is also crucial on a country's economic growth seeing as it is the first charge made from the total revenue collected in a period. This study aimed at establishing the effect of Debt Servicing on economic growth in Kenya. The study sought to: ascertain the effect of external debt on economic growth; establish the effect of domestic debt on economic growth; and determine the effect of total interest payment on economic growth in Kenya. This study adopted a descriptive survey design and obtained secondary data on the variables. Data collected was in the form of Time series and quantitative in nature. The data was analysed by descriptive analysis. Inferential analysis involving correlation analysis was carried out to scrutinize the relationship between variables while regression analysis was performed to establish the strength of the independent variables against the dependent variable. Three independent variables which include: Debt Servicing, Domestic debt and external debt were regressed against the dependent variable: -Economic growth in Kenya to observe the relationship thereof. The study used time series to model the impact of public debt and its subsequent servicing to the rate of Gross Domestic Product growth in Kenya, and applied time series models, to be specific ARDL-EC model in order to come out with a deep analysis on the relationship between the three independent variables and economic growth rates in Kenya. The study found that external debt was significant in explaining economic growth, domestic debt had a negative but insignificant relationship with economic growth at the 5% critical level and no particular effect on economic growth in the short-run and finally that while debt servicing has an effect on economic growth in the short run, the effect is not significant. The conclusion was that the public debt in general, has no significant impact on economic growth in the country in the short run. The study recommended that borrowing for investments in infrastructural projects as proposed for in the Vision 2030, meant at ensuring that the country achieves a middle- income economy status should be encouraged, proceeds from external debt should be utilised properly (For infrastructural developments and advancement of the social status of the people and external debt levels are controlled and capped).

Key words: External debt, domestic debt, debt servicing and economic growth.

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DEDICATION

To my lovely mum Margaret and my daughter Samantha.

ABBREVIATION AND ACRONYMS

CBK	Central Bank of Kenya
GDP	Gross Domestic Product
GNP	Gross National Product
GoK	Government of Kenya
IMF	International Monetary Fund
SSA	Sub-Saharan Africa
TD	Total Debt
TDS	Total Debt Service
TEDS	Total External Debt Service

OPERATIONAL DEFINITION OF TERMS

Domestic Debt	This is debt incurred by the government from borrowing from residents of its own country and usually in domestic currency (Corkill, 2007).
Economic growth	The quantitative change or expansion in a country's economy (Abdullatif, 2003).
External Debt	This is debts acquired outside the country, of all branches of government and all debts carrying a government guarantee that is debts guaranteed by the National government to State Corporations and County Governments (Government of Kenya, 2018).
Gross Domestic Product	This is the monetary value of finished goods and services created in a nation's borders in a particular time-period (calculated annually). It is a summation of all private and public consumption, government expenses, investments, and net exports that take place within that Nation (IMF, 2010).
Gross National Product	It is the aggregate value of all finished goods and services created in a country per annum by its citizens (IMF, 2010).
Total Interest	Interest due on both Domestic and External debt measured annually (GoK, 2018).
Public debt	Total stock of direct government contractual obligations to others, either internal or external, outstanding on a particular date(International Monetary Fund,2018).

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Developing countries usually take the option to borrow funds internally or externally to finance their various infrastructural projects as a result of scarcity or insufficiency of financial resources in their respective economies. The delivery of economic services (agriculture, communication, construction, transport and others) for the enhancement of the quality of life of citizens in developing or third world countries is reliant on several factors including availability of good governance, financial resources, political will, interest rate on loanable fund, external loan accessibility and other numerous to mention factors.

Weak economies as a result of low proceeds from taxes generation usually find it tremendously difficult to meet their expenses and have to issue bonds and treasury bills to their citizens domestically or secure loans from International financial institutions. Malik and Siddiqui (2001) assert that domestic and foreign borrowings are considered as normal phenomenon because countries at the initial stages of development need capital stock. International Financial Institutions like World Bank, International Monetary Fund, Asian Development Bank and International Bank for Reconstruction and Development are the lending donor agencies. They give loan on hard and soft conditions depending upon the credit rating of the country.

One of the most critical components in economic development in any country is Public debt. Its servicing is also crucial on a nation's economic growth seeing as it is the first charge

made from the total revenue collected in a period. Fundamentally, it is expected that debt servicing as an outcome of public debt will result to the economy's slow progress as more resources will be utilized to repay the debt leaving less for economic growth. Funds from public debt ought to therefore, be used prudently in funding government overheads leading to growth of the country's economy and be able to pay the debt back when it is due (IMF,2017).

There has been a significant rise in publicly owed debt and in effect, higher debt servicing. This has raised concerns on the effect of debt servicing on the general economic growth in the world and whether it is sustainable in elongated periods. Debt servicing takes a big share of government's recurrent expenses and overall income, posing risks to state's budgets and countries solidity. Rising debt gestures that governments will imminently use a huge proportion of their returns paying back the debt at the peril of other essential investments (IMF, 2014).

1.2 Public Debt

For a government to be able to achieve its obligations, be it infrastructural or achieve its goals for example, the Vision 2030 or the Social Development Goals, it needs funding. This Funds are mainly from taxes and or borrowing. Most governments are not able to raise adequate funding from taxes hence they resort to borrowing either externally or internally to bridge the deficit in receipts and expenditures. This has led to an increased Global debt burden as more and more countries are leaning towards borrowing to be able to meet their obligations (Magero, 2015). Public debt generally comprises of External and Domestic debt. A country's total public debt is the external, internal debt and their subsequent servicing. In this study, domestic debt and external debt are the key indicators of debt.

1.2.1 External Debt

Global public debt, has taken a setback (World Bank 2018). After a decline in the mid-1970s, public debt has since risen, with developed economies at the top and, lately, followed by middle-income developing and low-income developing countries. In 2017, Global debt extended to a record high of USD 184 trillion in nominal terms, equaling 225 percent of the GDP. World debt now exceeds USD 86,000 in per capita terms, 2½ times higher than the average income per-capita (IMF, 2019).

In Africa, the debt crisis of Sub-Saharan African nations rose swiftly after the worldwide debt distress that begun in the 1980's. This led to most developing countries in Africa borrowing too much and more loaning by multinational banks. The breakdown of the worldwide goods prices and specifically petrol also deteriorated the state of affairs in Africa (IMF, 2011). SSA is falling in a fresh debt crunch, with 40 percent of SSA nations now at a risk of debt crisis. As of 2016, external debt burden in SSA had risen from USD 262,995.5 million in 2009 to USD 524,119.3 million in 2017(World Bank, 2019).

The International Monetary Fund (2017), opines that most countries in Sub-Saharan Africa had borrowed in foreign currencies and are finding debt tough to finance after a substantial devaluation. SSA governments dispensed over \$80 billion in dollar bonds. There have also been gloomier syndicated loans and bilateral debts, most to China, which has over USD 60 billion on offer, tied to big construction projects. Much of Africa has a shallow domestic market and no country in the world can self-finance (African Economic Review Consortium, 2018).

There has been an increase in Kenya's publicly owed debt and more particularly, in the last five years. In this period, the total debt has increased by a factor of 3.0 from Kshs 1,894,117 million in June 2013, to Kshs 5,047,234 million in June 2018 translating to Kshs 106,000 per Kenyan (Economics Institute of Kenya, 2017). This rise represents an increase in Debt to GDP

ratio of 15%, in the same period. Table 1.2.2.I below displays the increase in external debt and its percentage to Total debt stock and its percentages to the country's GDP (Government of Kenya, 2018).

Table 1.2.1.I: Kenya's External debt

Financial Year	June-13	June-14	June-15	June-16	June-17	June-18
External Debt	843,562.00	1,138,505.00	1,423,252.00	1,796,198.00	2,294,153.00	2,568,398.70
As a % of GDP	18.80%	22.60%	24.40%	26.80%	30.00%	29.00%
As a % of total Debt	44.50%	47.00%	50.00%	49.70%	52.10%	50.90%
Total Debt	1,894,117.00	2,422,832.00	2,843,696.00	3,611,331.00	4,406,863.00	5,047,234.00
As a % of GDP	42.10%	48.00%	48.80%	53.80%	57.50%	57.10%

Source; GoK(2018)

Kenya's total external debt as at June 2018, stood at Kshs. 2,568,398.70 and continues to increase. External debt provides limited foreign exchange for importation of capital goods and food imports during dire periods of shortage and maintains consumption levels of the disadvantaged. Due to unbalanced capital flows, mobilizing domestic resources to ensure greater stability in investment is paramount. External borrowing assists current domestic investments if used to import goods for production/development. It also allows the acquisition of both public and private foreign assets that could be used to service payments thus reducing the resources, output and savings restrictions essential in the economy. Foreign borrowing can also serve to prompt income growth through increased domestic investments (Makau, 2008). On the other hand, high external debt leads to increased servicing and may lead to a debt overhang a situation where the country may not be able to fulfill its debt servicing obligations hence defaulting on it and in effect messing up with the economy's growth.

1.2.2 Domestic Debt

The Medium Term Debt Strategy report (2018), opines that Domestic debt as at June 2018 was Kshs 2,478,835 million. High stocks of domestic debt come with a substantial economic cost which is weak economic growth. Public debt is the most essential source of funds to finance development plans in Kenya, as the budgetary situation of the government has always remained in deficit (Warega, 2012). Some portion of the deficit is met through domestic borrowing. As a result, the volume of the debt has also increased quite sharply in recent years. Even though raising enough funds in form of public debt is crucial for continuous economic growth and to finish continued poverty, a failure to meet debt obligations would lead to a severe economic crisis (Government of Kenya, 2018). Table 1.2.2.II below shows the Domestic debt stock and its percentage to the total debt and the country's GDP (Government of Kenya, 2018). The escalation of domestic debt has led to a subsequent rise in debt servicing expenses, leaving fewer resources for investment in economic infrastructure and outlays on other vital items (Gikandu, 2012).

Table 1.2.2.I: Kenya's Domestic debt

Financial Year	June-13	June-14	June-15	June-16	June-17	June-18
Domestic Debt	1,050,555.00	1,284,327.00	1,420,444.00	1,815,133.00	2,112,710.00	2,478,835.00
As a % of GDP	23.40%	25.50%	24.40%	27.10%	27.60%	28.00%
As a % of total Debt	55.50%	53.00%	50.00%	50.30%	47.90%	49.10%
Total Debt	1,894,117.00	2,422,832.00	2,843,696.00	3,611,331.00	4,406,863.00	5,047,234.00
As a % of GDP	42.10%	48.00%	48.80%	53.80%	57.50%	57.10%

1.3 Debt Servicing

Debt makes resources available in the economy but also can have negative impacts on it. Suleiman and Azeez (2012), opined that high debt build-up uncovers nations to a huge debt load and its repayment is the main danger to the nation's development. Additionally, if resources from debt are not used prudently or for the required purposes, more resources will need to be employed in order to service the debt and in effect, reducing private investments and stalling economic growth.

The aggregation of principal repayments and interest to be paid in currency, goods or services on long term debt and short term debt makes reference to debt servicing. It is the debtor nation's repayment of the principal and interest components of an outstanding loan as at and when it falls due. In Kenya, debt servicing has put a great set back and threat to the economic growth and development of the nation. This largely places huge weights on the economy with consequences like abnormally high inflation rates, increased number of the population living below the poverty line, high levels of unemployment, engaging in illegal activities by the unemployed youth and corrupt activities (Were,2001).

In Kenya, Total debt servicing as a percentage of revenue stood at 33.8%. Table 1.3.I below shows the Total Debt servicing, domestic interest and both the external principal and interest debt servicing for the past five years. There has been a significant increase in Debt servicing from Kshs 148,228 million in June 2013 to Kshs 460,135 million in June 2018. An analysis of the costs and risks indicators of the public debt (total public debt including guaranteed debt) indicates that annual total interest payment in 2017/18 was 4.1 percent of GDP. The annual interest payment is expected to rise further due to Debts maturing in the next year (Annual Public Debt Management Report 2018).

Table 1.3.I: Trend of Public debt service in Kenya

Financial Year	June-13	June-14	June-15	June-16	June-17	June-18
Domestic Interest	110,184.00	119,200.00	139,727.00	172,857.00	212,865.00	239,497.00
As a % of TDS	75.90%	74.20%	55.20%	68.70%	69.00%	52.10%
External Principal	23,993.00	25,800.00	80,214.00	36,015.00	37,256.00	138,989.00
External Interest	11,051.00	15,600.00	33,330.00	42,568.00	58,367.00	81,649.00
Total External Debt service	35,044.00	41,400.00	113,544.00	78,583.00	95,623.00	220,638.00
As a % of TDS	24.10%	25.80%	44.80%	31.30%	31.00%	47.90%
Total Debt Service	148,228.00	160,600.00	253,271.00	251,440.00	308,488.00	460,135.00
As a % of Revenue	18.60%	17.50%	24.50%	21.80%	23.60%	33.80%

Source: GoK, (2018)

1.4 Economic Growth

Sustainable economic growth is a predominant concern to all economies and an effective tool for economic growth is comprehensive macroeconomic strategies on both private and public ventures to increase output, national income, generate wealth, reduce inflation, unemployment, and fund service delivery (Saunweme & Mufandaedza, 2013). However, this is not the case as countries are unable to collect enough revenue to finance national budgets and hence put a reliance on domestic and external debt to finance economy growth and expansion (Ali & Mustafa, 2009; Boboye & Ojo, 2012). This, makes debt a key economic strategy matter challenging governments today (Maana, Owino, & Mutai, 2008).

Economies either grow "broadly" by employing more resources (physical, human or natural capital) or "narrowly" by using the existing resources more productively. Economic growth often indicates rises in the average standard of living. GDP measures the worth of the goods and services created by an economy. Economic growth is calculated in real or inflation-adjusted terms, to net out the results of changes on the price of the goods and services made.

In Kenya, real and nominal GDP has been fluctuating as shown in Table 1.3 below (Central Bank Statistics, 2018).

Table 1.4.I; Annual GDP trends

Year	Nominal GDP(millions)	Annual GDP (%)	RealGDP Prices(millions)
2017	7,749,426	4.9	4,510,391
2016	7,194,147	5.9	4,300,302
2015	6,284,185	5.7	4,061,901
2014	5,402,647	5.4	3,842,186
2013	4,745,090	5.9	3,646,821
Average	6,275,099	5.6	4,072,320

Source; CBK (2018)

1.4.1 Debt Servicing and Economic growth

IMF report 2010, contends that most of the European countries have experienced external public debt in excess of 100% GDP for nearly two decades and that before the 2008 financial crisis, public debt of the Eurozone countries was about 50% of GDP on average; this was 10% higher than in the early 1990s. Since 2007, the debt ratio has increased by 10% to 60% of GDP.

According to Reinhart, Carmen and Rogoff (2010), public debt, its servicing and economic growth are linked in that it is low growth levels lead to high debt margins and high debt levels have a substantial cost on the economy. This cost is weak economic growth. Debt stocks affect a country's economic growth since they lead to High servicing costs. With high servicing costs, it is expected that more resources will be employed in paying back debt, leaving few resources for economic growth.

In Sub-Saharan Africa, Public debt has now scaled to above 50% of Gross Domestic Product (GDP) in nearly half the countries (IMF, 2018). However, Africa's public debt has not yet reached the proportions that triggered the Highly Indebted Poor Country (HIPC) initiative,

the concern is that, Africa's present debt has risen sharply in a very short space of time. Heavy debt servicing has raised apprehensions regarding sustainability, and carries immediate implications for macroeconomic stability, consequently economic growth and development. African nations incapable of servicing their debts has doubled in the last year to eight, and the International Monetary Fund is advising the nations to increase taxes to offer more opportunities for servicing interest on debt (IMF, 2018).

Twelve SSA countries gave a total of USD15 billion in sovereign bonds, which have been taken by Investors, seduced by the continent's promising growth outlook and the potential of high yields. World Bank projects that average GDP in SSA will remain mostly unaffected at 4.6% in 2015 and will be increasing progressively in the next two years, to 5.1% (World Bank 2016).

According to the Government of Kenya (2007), poor governance and corruption have been the main cause for economic problems however, debt and its servicing has equally slanted the economy, convoluted macroeconomic organization, instigating poor socio-economic standing for Kenyans. The debt load has been made worse by the cumulative economic and balance of payment deficits, poor exports potential, and relying too much on exports primarily; overrated exchange and negated real interest rates which led to an increase in public debt which is estimated to be 57.1% of GDP (Republic of Kenya, 2018).

The negative consequences aside, nations have to borrow and service their loans because they cannot provide all that they need and the running of government must be carried out with funds. The concern arising as a result of this is on how these debts are managed and put into appropriate use in order to have return on the investment which will be plunged into the economy for further growth. Putting into consideration the huge amount of money

earmarked for servicing Kenya's debt profile, there is no substantial proof of a decrease in the size of debt payable to diverse financial institutions at home and abroad. This in a very large degree has been impeding the growth of the economy and is believed to be affecting the overall economic growth of the nation.

1.4.2 Debt and Economic growth

The relationship between public debt and economic growth is a major concern for policy makers. This is because a debt is supposed to add to already existing resources in an economy which should lead to greater economic performance and development. But this is not always the case in most of Sub Saharan African countries. There is little empirical work that has investigated this relationship. Furthermore, there is even less evidence on the specific channels through which debt affects growth. A prudent public debt management helps economic growth and stability through mobilizing resources with low cost of borrowing and limited risks to financial exposure. Domestic debt may have positive as well as negative impacts on economic growth. In less developed countries, governments use public debt as an imperative tool to finance its expenditures. Economic growth can be increased by effective and proficient utilization of resources to achieve macroeconomic goals. However, if the public debt is not properly utilized, it would restrict economic growth and become the biggest curse for the economy.

The external debt situation for a number of low income countries, mostly in Africa has become extremely different. For these countries, even full use of traditional mechanism of rescheduling and debt resection together with continued provision of concessional financing and pursuit of sound economic policies may not be sufficient to attain sustainable external debt levels within a reasonable period of time and without additional external support (Ocampo,2004).

Domestic debt can have severe implications for the economy if not well utilized because its servicing takes up a major part of government revenues resulting in dogged deficit meaning that the Government has scarcer resources to spend on expansion projects (Ayres and Warr, 2010). In this way, internal debt servicing is more harmful for the economic growth than the stock of internal debt. Moreover, in shallow financial markets, as the domestic debt increases, the interest cost also rises due to holding a large amount of debt in short term instruments.

According to Were (2001), the resources that could have been allocated to consumption and investment are instead being channeled abroad through debt repayment/ servicing. This reduces the resources available for the country to engage in developmental projects and to partake in adjustment programs aimed at increasing growth. Unless a country grows fast enough to sustain debt obligations and maintain domestic investment, indefinite external indebtedness will have very detrimental effects on the economy's growth and on the welfare of the citizens.

1.5 Statement of the Problem

Globally, raising adequate funds for government plans still is a key issue as countries do not have enough resources to service its budgeted requirements. Executing development plans, especially in emerging economies remains a main huddle (Mailafiya, 2010). External debt alone on SSA countries has significantly increased from USD 236 billion in 2008 to 536 billion in 2018. The debt as a percentage of the Gross National Income was 36% in 2018 up from 21% in 2008 (World Bank International Debt Statistics, 2020). High stocks of external debt and their eventual servicing could result in a position where a nation is unable to repay its debt leading to defaults (Atique& Malik, 2012).

Kenya like most Sub-Saharan African countries has been experiencing problems in its indebtedness. This is traced to the undertakings of the Government, in amassing external debt

for development projects. Since independence, Kenya has taken up projects with an aim of strengthening its economy, mostly with the support from donor funds and occasioned by foreign financing in the form of loans. The influx of infrastructural projects aimed at improving the welfare of the citizens and the necessity to get more money in order to achieve the government's agenda has led to a steady increase in Kenya's publicly owed debt. Further, the development projects were designed to improve the domestic industry and infrastructure rather than improving export production directly. The assumption was that the economy would grow over time and that corresponding increases in exports and realistic export prices would allow the debt-service obligations arising from these projects to be met hence spurring economic growth. This has however not been the case as most of the money borrowed is squandered through corruption. Kenya's External debt stood at 33.7% and Domestic debt on the other hand stood at 28% of the total revenue in June 2018 and the rate of external interest payment to exports was 40.5% of the total revenue (GoK, 2018). This shows that the country has had an over reliance on Public debt and with the pressure to achieve the Vision 2030 goals and the need to reduce unemployment levels, the claims of a debt crisis need to be taken seriously (Achieng, 2010).

Studies done on Public Debt and economic growth generally emphasized on external debt in a period and found out that there was an inverse link between external debt and economic growth in Kenya in the long run. This means that increasing public debt will lead to a slow growth in the economy. It therefore is important to analyse why this has not been the trend in the country for the past 5 years as the economy has been growing at a constant rate of 4% and whether this trend is different at some levels of debt or whether there are other factors that may have affected previous research. Makau (2008) carried out an empirical analysis on the external public debt servicing and economic growth in Kenya and found that external debt

and its subsequent service impacts negatively on economic growth. More recent studies on debt were carried out by Musyoka (2016) on the effect of public debt on economic growth in Kenya. The study concluded that economic growth is negatively affected by Public debt. However, the focus of previous studies has been only on either external debt or domestic debt or both but did not analyse the total debt servicing. None of these studies analyzed both External, Domestic and Total Debt Servicing that is total interest on domestic debt, and External debt as stand-alone variables in public debt. This study therefore, seeks to fill this gap by analyzing the effect of public debt and all its components on economic growth in Kenya. It seeks to answer the question does public debt and its servicing have an effect on economic growth in Kenya?

1.6 Objective of the study

1.6.1 General Objective

The main objective of this study was to determine the effect of public debt on Economic Growth in Kenya.

1.6.2 Specific Objectives

Specifically, the study sought to:

1. To ascertain the effect of External Debt on economic growth in Kenya.
2. To establish the effect of Domestic debt on economic growth in Kenya
3. To determine the effect of total debt servicing (interest and principal payments) on economic growth in Kenya.

1.7 Research Questions

1. What is the effect of External debt on economic growth in Kenya?
2. How does domestic debt affect economic growth in Kenya?

3. How does total debt servicing (interest and principal payments) affect economic growth in Kenya?

1.8 Significance of the Study

1.8.1 The Government of Kenya

The Ministry of Finance who are the custodians of public debt, the study will help them gain a deeper understanding on the effect of outstanding debt stock and its subsequent servicing on the economic growth in Kenya and hence come up with policies that will help them come up with policies that will ensure that the country makes sound policy management decisions when it comes to debt management.

The Central Bank of Kenya is authorized with the formulation and execution of monetary policy aimed at maintaining stability in the overall price levels. Knowledge on the effect of outstanding debt stock and its related servicing on the country's growth will ensure sound monetary policies are put in place in order to bring balance in external and domestic debts. Interest repayments are a huge component of the domestic debt in Kenya and as such CBK will benefit from the study.

1.8.2 Researchers

The study will contribute to the available knowledge on economic growth, debt and its related servicing and also fill the gap on the link between these stand-alone variables especially by providing literature from Kenya for future reference by the other researchers.

1.8.3 Higher Learning Institutions

The study will contribute to Institutions of Higher learning by adding current and up to date data on the available knowledge on Debt servicing and its effect on economic growth and help the students to refer to this data in their studies.

1.8.4 Policy Makers

The policymakers, in this case parliament who are the approvers of both external and internal debt and are responsible for setting the debt limit, according to the PFM Act, 2012 the study will help them gain a deeper understanding on the effect of public debt and its servicing on the economic growth in Kenya ,hence come up with policies that will aid them in ensuring that Kenya makes sound policy management decisions when it comes to debt management.

1.9 Scope of the Study

This research concentrated on External and Domestic debt stock, and the interest therein and economic growth. The study was undertaken in Nairobi Kenya because it's the country's Headquarters and all the required data will be available at this point. The study covered the period between 2003 and 2018.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section aims at building on the existing literature for the sole purpose of examining the phenomenon. A number of researchers have carried out research on the variables linked to debt servicing that affect economic growth and have come up with differing results from the developed economies and the developing ones. It was the intention of this study to build up on those that have previously done similar studies to help in ascertaining the public debt effects on Economic Growth in Kenya. This part reviews literature associated with debt and its components that is; External Debt, Domestic debt and total interest. It also analysed the effect these variables had on economic growth and the association between the variables. There are quite a number of literature covering theory and empirical studies. This particular study will base on some of these studies to support the analysis of the effect of public debt on economic growth in Kenya.

Boote et al (2005) opines that for a researcher to develop a clear and deep knowledge and understanding on a subject, she needs to familiarize herself with what has been done and evaluate the weaknesses and strengths of extant literature and how meaningful they are or maybe to her current study. Generally, research must be growing in nature, building up on the history and be a foundation of knowledge for the researcher on the subject under debate.

2.2 Theoretical Review

This section examined the theories which are relevant in supporting the purposes of the study in ascertaining the debt servicing effects on Economic Growth in Kenya. There exist several

theories relating to this subject but this particular study analyzed the Debt Overhang, Crowding out effect and the Keynesian theories as discussed below:

2.2.1 Debt Overhang Theory

The debt overhang theory was proposed by Stewart C. Myers in the early 1970's when he attempted to explain the effects of High debt. It contends that higher external interest payments can raise a country's budget deficit and reduce public savings if private savings do not increase to offset the difference. In that case, interest rates will drive up or crowd out the existing credit for private investment, depressing the advancement of the economy. Debt repayment will discourage growth by squeezing the public assets offered for investment in infrastructure and human capital (Clements et al., 2005).

The theory further submits that public debt effects are non-linear on development, either through build-up of capital or output advancement and that possibility that, debt, in the long run, may be greater than the nation's capacity to repay and estimated debt servicing expenses will exasperate additional domestic and foreign investment. Basically, it is rather worrying and raises the interrogation of whether a debtor country can continue to service its debt, and at the same time, achieve sustainable growth.

Debt overhang in sub-Saharan Africa has been advanced by Clemens et al. (2003), Pattillo et al. (2002), who contended that excessive indebtedness has a negative effect on the growth rate. They concluded that extreme indebtedness and default tend to reduce the real growth rate and the standing of the State. El Badawi et al. (1997) confirmed the effect of debt overhang on economic growth in 99 developing countries, and tried to identify the channel through which indebtedness impacts negatively on growth. In their study, they identified three conduits of transmission of the effects of debt on growth. These are the impacts of debt on growth, liquidity (as a result of the draw down due on debt service), and indirectly on spending

related to the public sector and shortages. The study concluded that it was the accrual of debt which had a negative impact on growth. Clemens et al. (2003), for their part, considered a growth model by choosing the virtual debt burden hypothesis. They arrived at the conclusion that a six-point debt service reduction in percentage of GDP will increase the investment rate from 0.75 to one point and growth to two points. Further-more, they believe that if half of debt service were cancelled without a rise in the budget deficit, growth will increase in some HIPC's by 0.5 point per annum. In a complementary study conducted in 2002, Pattillo et al. applied a growth accounting model to a group of 61 developing countries and noticed that doubling the average level of their external debt reduced the growth of both the physical capital per head and the total productivity of factors by almost one point.

In Kenya, Wanjuki, (2016) while looking at the effect of public debt on economic growth in Kenya, concurred with the debt overhang theory that high debt and its subsequent servicing may lead to a debt overhang which would make the country not be able to pay its obligations and in effect, lead to slow or lack of growth of the economy. This theory therefore backed the research on the effect of debt servicing on Economic Growth in Kenya that increased borrowing could cause debt overhang effect causing the government to default on debt payments when they fell due.

2.2.2 Crowding-out Effect Neo Classical Theory

Crowding out theory is traced to the empirical results published by Andersen and Jordan in 1968 leaning to the economic effects of expansionary fiscal actions. Crowding out theory proponents contend that if Government demand rises through funds from taxes, issuance of external or domestic debt, leading to failure in fueling overall activities in the economy, the private sector would have been 'crowded out' by this government move. Assumption of continuous money circulation ensures that the strategy complements that the increased

Government demand is economic and not monetarist. When debt is used to finance deficit, the resulting increase in the demand for money raises the interest rates thus increasing the cost of borrowing money. Consequently, since investment spending varies with interest rates, some investments will be crowded out (Fayed, 2012).

A bigger level of the crowding out effect theory is that it can lead to reduced income in the economy which will drive up interest rates. The resultant effect of this is that high interest rates will make it costly to obtain funds to invest which then reduces the accessibility to debt financing instruments. This in effect will lead to few investments and will crowd out the impact brought about by the initial increase in total investment spending usually funded by high taxes or borrowing by the government (Fayed, 2012).

Ahmed and Miller, (2000) in examining the effects of disaggregated government expenditure on private investment, used fixed and random effect approaches in the incident of some developed and emerging countries and established that government expenses on transport and communication in developing countries led to crowding in-effect and on the other hand, spending on welfare and social security leads to a decline in private investment.

Were, (2001) in establishing the impact of external debt on economic growth in Kenya, using time series data between 1970-1995 found that there seems to be a situation whereby private investment has undergone crowding-out in Kenya as a result of debt servicing. This theory therefore aligns with all the variables and their respective effect on economic growth. Crowding out effect theory supported the study in assessing whether high debt stock (both External and Domestic) had led to high interest rates and the subsequent effect it had on the economy.

2.2.3 Keynesian Economic Theory

Keynesian economics was advanced by John Maynard Keynes in 1936 while attempting to comprehend the Great Depression. He opined economic output is influenced by aggregate demand in the short run and that to pull the economy out of depression there was need for amplified government spending and reduced taxes to fuel demand. Keynes argued that increased savings will not lead to lower interest rates. Keynesian economics refers to a notion that ideal performance of the economy can be attained and economic collapses barred by inducing cumulative demand by way of innovative stability and governments formulating policies aimed at economic involvement albeit in the short run meant at correcting the short term needs of the economy. Keynesian theorists argue that government spending can be used to increase total demand, thus increasing economic activity, increasing employment and inflation.

He opined the great depression's solution was economic stimulation through blending a drop-in interest rates and rigorous infrastructure investment by governments. Government investments bring returns, which lead to further expenditure in the overall economy. This, encourages more invention and investment hence, more spending and income. The primary incentive spurs a variety of activities, whose total escalation in activities in the economy is a resulting ripple effect to the initial outlay leading to a non-equilibrium state in the economy.

The Keynesian economic theory points to the fact that public debt has a positive effect on economic growth in the country. The theory supported the current study in assessing whether indeed government spending from funds raised by external and domestic debt and their total interest repayment spur total demand and whether this causes a multiplication effect of the initial investment.

2.3 Empirical Review

Countries are finding raising ample funds for government development plans key since no particular country has sufficient resources. Both developed and emerging countries seek External debt due to this inadequacy of resources, countries turn to borrowing externally in order to fulfill their spending needs. However, with the amassing of debt, the future repayment charges on the debt also rise and it therefore becomes a danger to the strength of economies (Mailafiya, 2010). High debt servicing costs could indicate to defaults (Atique & Malik, 2012).

2.3.1 External Debt and Economic Growth

Reinhart and Rogoff, (2010) in their paper, Growth in a Time of Debt, used Barro's Ricardian equivalence theory on a multi-country (44 countries) public debt historical dataset. They sought to analyze whether there existed a systematic link between growth, inflation and public debt levels. The conclusion was that there existed a link though weak between debt and real GDP for ratios below 90% of GDP. At "normal" debt margins, this link was relatively weak. Countries with debt levels above an estimated 90% of GDP have Median growth rates that are a percentage lower than in others; average (mean) growth rates are several percentiles lower. However, the link between public debt and growth is the same across developing and advanced economies.

Ajayi and Oke, (2012) while determining the Effect of External Debt on Economic Growth and Development of Nigeria using the ordinary least squares method on variables like National Income, Debt Service Payment among others, found that high levels of external debt resulted in the currency of the country depreciating, increased layoffs, endless strikes and a deteriorated education system. As a result, the Nigerian economy experienced a depression. This current study will seek to find out whether this situation applies to the Kenyan aspect.

Victor et al. (2016) examined the relationship between external debt and economic growth in Nigeria for the period 1981 to 2014. The study employed both descriptive and econometric tools. The regression results showed a significant relationship between external debt and economic growth in Nigeria. However, external debt stock impacted positively while external debt service payment impacted negatively.

Osewe (2013) used Solow's method to analyse the effect of external debt and inflation on economic growth on Kenya and found that there was no long-term causality between the variables. Mukui, (2013) while studying the effect of external public debt on economic growth in Kenya, used a linear model to analyze Kenyan data from 1980 to 2011 with GDP growth rate as a function of external debt and found that external debt and, debt servicing have negative effects on economic growth Kibui, (2009) studied the impact of external debt on public investment and economic growth in Kenya using time series data from 1970-2007. He analysed Debt service and external debt as variables and the method applied was the reduced form growth model augmented with debt variables. The study found that key debt indicators had gone beyond critical levels from early 1982 and that debt service ratio was significant in explaining GDP growth in Kenya.

Were, (2001) in establishing the impact of external debt on economic growth in Kenya, used time series data between 1970 and 1995. They showed that external debt buildup had an adverse impact on economic growth. They also showed that existing debt inflows arouse private investment. However, there have been major policy changes since 2001 and this cannot be said to be true in the current period. This particular study compared the findings from this study in analyzing whether External Debt still has the same negative effect on economic growth or whether there is a deviation owing to the current debt situation in the country. The current study borrows heavily from this study albeit with slightly different variables.

2.3.2 Domestic Debt and Economic Growth

Abbas and Christensen, (2009) while analyzing the role of domestic debt markets in economic Growth covering 93 low-income countries and emerging markets over 1975–2004 used the Granger-causality regressions to estimate growth impact of domestic debt. The study gave proof that levels of debt beyond 35% of total bank deposits, have negative impact on economic growth. They proposed promotion of selection of channels: enhanced monetary policy; larger development of financial markets; reinforced accountability for domestic institutions; and improved private savings and financial intermediation. In analyzing the effect of domestic debt, this study will determine whether these findings mirror the Kenyan domestic debt market.

Achieng, (2010) studied the effect of domestic debt on the private investment in Kenya for the period between 1963-2009 and found out that domestic debt and debt service ratio variables were significant at the 95% confidence level. The research concentrated on domestic debt variable on private investment. Ochieng 2013 used Harrod Domar growth model in determining the relationship between public debt and economic growth and found that domestic debt was reasonably sustainable.

Putnoi & Mutuku (2013) examined the effect of public debt on economic growth in Kenya. They covered the period between 2000 and 2010. The study used the Augmented Dickey-Fuller test. The findings revealed that there was a constant rise in domestic debt up to 2010, this was partly due to a change in policy by the government's aligning itself to borrowing long term in the domestic market using treasury bonds as opposed to treasury bills. They also found out that in the same period interest rates had risen to 13% and recommended that there was a necessity to mend debt management by switching from expansionary to tightening policy. The study, however, did not incorporate just the core determinants of debt as this study has.

Njoroge, (2015) while analyzing the effect of domestic Public debt on economic growth in Kenya, used real quarterly time series data for 11 years from 2003 to 2013. He analyzed the GDP, Domestic Debt, and Private Sector Credit as variables and performed the Augmented Dickey-Fuller test. The research indicated that while total debt has negative effects on economic growth, public domestic debts have positive effects on the GDP. This particular study compared with other studies to determine whether the findings for Public debt divided into external and domestic debt as variables concur with those in the earlier studies. This study will use monthly data for five years.

2.3.3 Debt service and Economic Growth

Cholifihani, (2008) while analysing the long term and short-term relationships between public debt service and GDP in Indonesia using co integration analysis of time series for the period 1980- 2005. To analyse the relationships, he used an extended production function model that measured GDP as a function of debt service, capital stock, labor and human capital. The result show that in the long run, Indonesia there will have aspects of debt overhang as the rise in public external debt service slows economic growth.

Adesola, (2010) while studying the effect of external debt service payment practices on sustainable economic growth and development with particular emphasis on Nigeria, focusing on debt payment to Multilateral Financial creditors, Paris club creditors, London club creditors, Promissory notes holders and other creditors (Non-Paris Creditors) as variables with an aim of establishing whether they have inverse relationship with GDP and gross fixed capital formation at current market prices, for the period between 1981 and 2004, using the OLS multiple regression method. The study found that debt repayment to all the variables with the exception of Multilateral Financial creditors have an impact on the GDP. Debt servicing to

Paris club creditors and promissory notes holders are positively linked to GDP while debt payment to London club creditors and other creditors showed a negative relation to GDP.

Nazifi, (2014) investigated the causality between debt service payments and provision of social services in Nigeria from 1980 to 2010 employing Augmented Dickey Fuller (ADF) unit root test and Ordinary Least Square estimating technique. Empirical findings from the study revealed a positive relationship between internal debt, exchange rate and social services provision, while an inverse relationship exists between external debt and social service provision. The study suggested the need for more innovativeness in tax collection and administration and implementation of more public-private-partnership in infrastructural financing.

Musyoka, (2008) carried out a study on the relationship between Debt servicing and economic growth in Kenya for the period 1970-2008 using ADF unit root tests. The variable analysed was Total Debt servicing. The study found out that external debt servicing and debt servicing as a variable, had no effect on economic growth. However, this was only due to the fact that the study used total debt servicing per year and did not break down the components of debt servicing that is, interest and principal repayment. Further at the time of the study, the debt stock was not as high as it is currently. This current research will mirror Musyoka's research by using Time series data and carry out ADF unit root tests. Additionally, this study analyzed the outstanding debt stock (both domestic and foreign) and the underlying interest and principal repayments against the GDP.

2.4 Summary of Literature Review

Overall, there exist a conflict on the effect of public debt and its servicing on the economic growth of a country. A number of studies find that there is a negative relationship which

coincides with the economic theory, while others found that there was a positive relationship. Other studies have emphasized that debt and its components do not have particular effect on the growth of the economy. Gaps in the studies analyzed are as shown in Appendix 1.

This current research assessed the effect and conclusively added its voice to the debate on whether public debt components have an effect on the economy. Since in spite of the expectation that public debt and its servicing negatively impacts the GDP, Kenya's GDP has been growing at an average of 5.6% in spite of the increased debt. This current study in examining the effect of public debt (using debt stock-external and domestic and total debt service payment as variables) on the growth of the economy and linked the theories- Debt Overhang, Crowding out Effect and the Keynesian Economy theory to determine which best explained the current scope. Further this particular study looked at the total effects of public debt and its repayment on economic growth as opposed to previous studies that have looked at causality.

2.5 Conceptual Framework

The conceptual model was developed to draw a relationship between dependent variable and independent variables. The independent variable is Public debt which was been broken down into Domestic Debt, External debt and total interest payment on debt and the dependent variable is Economic Growth. The conceptual model for the study is presented in Figure 2.5.1 below.

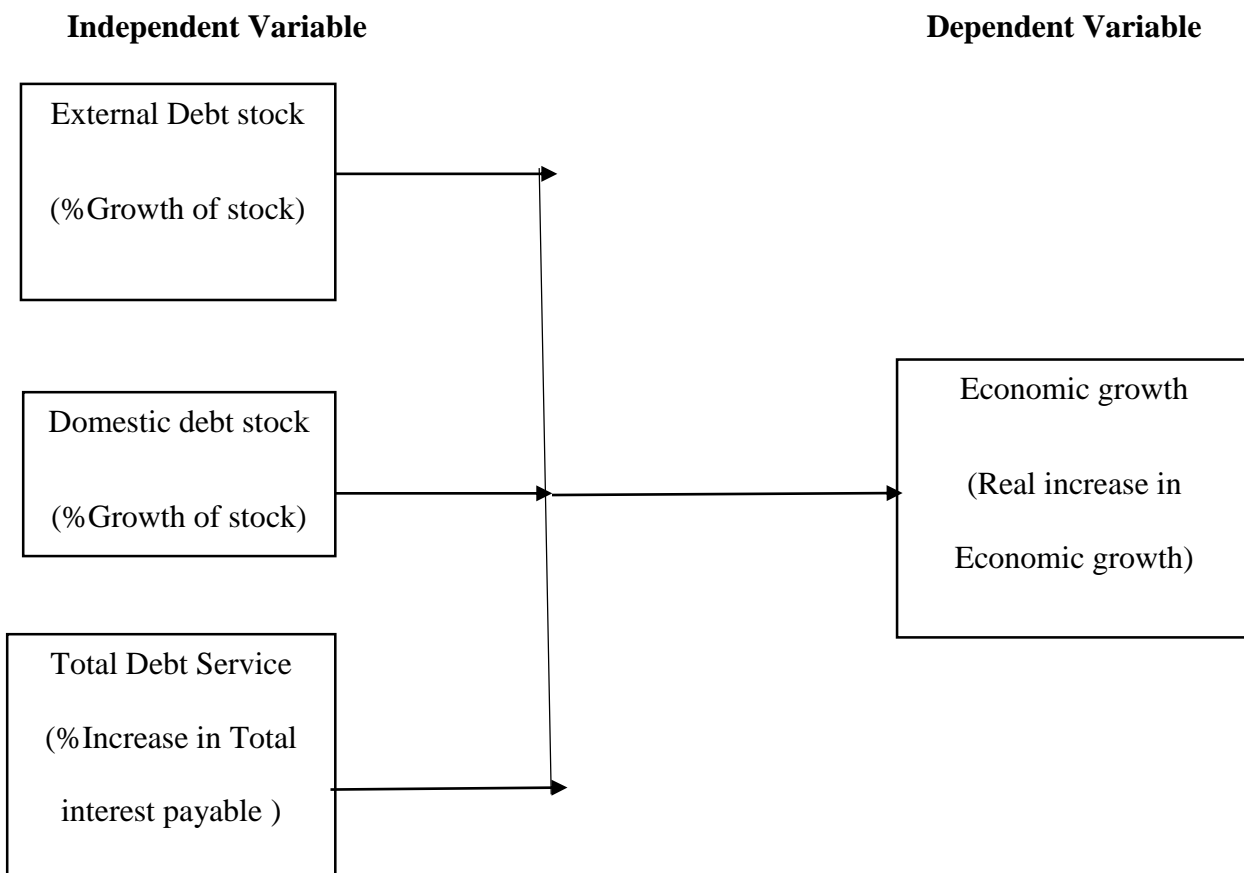


Figure 2.5.1; Conceptual Framework

2.6 Operationalization of Variables

This section looks at how the variables were specifically collected, recorded, coded and measured. Basically, the study looked into the effect External debt (EXDebt) and Domestic Debt (DomDebt) and Interest (DebstSVX) has on the economic growth of Kenya. The data studied here is quantitative in all variables and so raw data from the Central Bank of Kenya, Kenya National Bureau of Statistics (KNBS), World Bank and other published journals were used and measured as below:

The endogenous or dependent variable in the model influenced by a number of explanatory variables was economic growth.

Economic Growth

These were nominal increase in the amount of goods and services provided by the government at various levels for the improvement of the living standard of citizens. According to Central Bank of Nigeria classification, the provision of transport, communication and construction fall under economic services. The quality and quantity of these services provided by the government are greatly influenced by the external debt, internal debt and debt service payment. Expenditure on economic services provision was said to be dependent on these regressors.

The Kenyan Economic growth is as provided by the Kenya National Bureau of statistics on an annual basis. This is normally given as an average percentage increase per year and therefore was not converted.

The exogenous or explanatory variables included in the model are:

External debt

External debt or foreign debt was that part of the total debt that was owed to lenders outside the country. External debt has to be paid back in the currency in which it is borrowed. It can be obtained from foreign commercial banks, international financial institutions like International Monetary Fund, World Bank, African Development Bank and International Bank for Reconstruction and Development. This variable was expected to be negatively related with economic services provision in Kenya. The higher the amount of external debt, the higher the expenditure that would be earmarked by the government for economic services provision while the converse is true.

External debt represents all the debt issued to the government- Bilateral, Unilateral and multilateral in addition to all guaranteed debt and sovereign bonds. It was operationalized as percentage increase in external debt that is $(\text{Ext Debt in quarter 2} - \text{ExtDebt in quarter 1} / \text{Extdebt in quarter 1}) * 100$

Domestic Debt

Alternatively known as internal debt is the part of the total government debt in a country that is owed to lenders within the country. Internal debt complements external debt. Commercial banks and other financial institutions constitute the sources of funds for the internal debt. The government borrows from the citizens through the issuance of bonds and treasury bills. Domestic debt represents all the total bonds and treasury bills that have been issued by the national government regardless of who holds the debt (lender or creditor).

This variable theoretically should exert positive relationship with economic services provision. The higher the amount of domestic debt sourced by the government, the greater the expenditure that would be committed to the provision of economic services for the citizenry while the reverse is true. Total domestic debt was measured as a percentage increase that is $(\text{DomDebt in quarter 2} - \text{DomDebt in quarter 1}) / \text{Domdebt in quarter 1} * 100$

Total Debt Service

Debt servicing implied the regular payment of installments of loans taken by a country from domestic and external sources. An installment includes interest on debt and a part of the principal. For servicing debt, a country or corporate organization should have those timely cash flows. If a country is unable to honor its debt service obligations in the absence of required funds, the country was said to be unable to service her debt.

This variable was expected to be inversely related with economic services provision. This is because the higher the amount of money required to service existing domestic and foreign debts, the lesser would be the amount of fund available for provision of qualitative and quantitative economic services. Operationalized into Total Debt servicing represents all the

interest paid (Domestic and external) as a result of both External and domestic debt amassed.

Debt service was measured as $(\text{Debt service in quarter 2} - \text{DebtSVX in quarter 1}) / \text{Debt SVX in quarter 1} * 100$

Table 2.6.I; Operationalization of variables

VARIABLE	DEFINITION OF VARIABLE	INDICATOR	CATEGORY OF DATA	MEASUREMENT
External Debt	Denoted as EXDebt	Amount borrowed by the Kenyan government	Ratio	$(\text{Ext Debt in quarter 2} - \text{ExtDebt in quarter 1}) / \text{Extdebt in quarter 1} * 100$
Domestic Debt	Denoted as DomDebt.	Amount borrowed by the Kenyan government domestically.	Ratio	$((\text{DomDebt in quarter 2} - \text{DomDebt in quarter 1}) / \text{Domdebt in quarter 1}) * 100$
Debt Servicing	Denoted as DebtSVX	Amount of total interest paid annually	Ratio	$(\text{DebtSVX in quarter 2} - \text{DebtSVX in quarter 1}) / \text{Debt SVX in quarter 1} * 100$
Economic Growth	ECGROWTH		Ratio	Real economygrowth.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter represents the methodology used in analysing the collected data, the design applied, the population used, data collection and analysis tools and the models used in specifying the data. It generally paints a picture of what the research did while focusing on the description of the study area, Research design, population of the study, sampling design, data collection methods, data analysis and the limitations that were experienced during the study.

Walliman, (2011) states that research is an activity that involves discovery, in an organised way, things a researcher did not know. Methodology on the other hand is said to be the logical context within which the research is carried out or the foundation upon which the research is initiated or the technical or scientific activities, tools, and procedures taken to plan gather and analyze data. This chapter in a research project is essentially a description of research methods, designs and approaches explicitly specifying and highlighting those used throughout the study. It also gives a justification to the researcher's choice through offering pros and cons of each style and design considering their applicability to the current study.

3.2 Research Design

Creswell, (2014) states that research design is a prelude showing the approaches and procedures for collection and analysis of essential information to undertake the research. It is the framework on how to answer the research questions. It gives the guide on how to arrange for the conditions for the study. This study adopted a quantitative research design. It is worth noting that quantitative methods puts more emphasis on objective measurements and mathematical, the statistical, and or numerical analysis of data collected, or by manipulating

pre-existing statistical data using computational techniques. Quantitative research always focuses on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon. The design adopted here is normally used to gather quantitative data. It encompasses objectively looking at measurements and generally the statistics, figures and an analysis of data collected or even by influencing existing data using computational techniques. Moreover, it includes gathering numerical data and analyzing it critically to explain a phenomenon (Mac Donald and Headlam, 2005).

3.3 Population

Kombo and Tromp (2011) define a population as objects, items or a group of individuals where samples are taken to be measured. Kothari (2011) defines the population as the researcher's "universe." The Population, therefore, consisted of the country's total debt service, External and domestic debt and the rate of economic growth from the year 2001 to 2019. The period was considered because it provides the most recent data on the study area and it is during this period that the country recorded increased amounts of domestic debts with the domestic debt instruments like treasury bills and bonds being traded in the Nairobi Securities Exchange thereby being accessible to the general public. This particular study focused on a trend and not one-off data collection, the research employed time series to bring out meaningful observations. Time series data is data collected over a particular period of time and its analysis could be used by management in forecasting and planning (Mason & Lind, 2003).

Economic changes through the variables studied here have for years been a subject of discussion by the policy makers, development partners, the citizenry and economists in this country. The discussions revolved around whether there exists a relationship or not. The consideration taken by time series data is that although there may be internal structure within it like autocorrelation, seasonal trend or significant variations these structures can be analyzed

to extract some meaning. Hence, for the nineteen year-data to be researched on currently, the data was considered to review any seasonal variations, trends or auto correlation and see if there is a relationship between the figures gathered for the independent variables herein and the dependent variable.

3.4 Data collection

The data used here was purely from secondary sources. Data from the perusals on the Kenya National Bureau of Statistics (KNBS) library and archives found the data as appended in appendix 3 attached herewith. Secondary data on public expenditure taxes collected and the National debt was also collected from the central bank of Kenya, Kenya National Bureau of Statistics (KNBS) and the World Bank. This data was used with of course the requisite acknowledgements and citations where and when necessary.

3.5 Data analysis

The collected data was checked for accuracy and completeness, summarized in form of tables and graphs to tell the drifts of variables development overtime. To get the relationship between the variables, a co-integrating regression model was applied on the time series data. The data was then entered into Stata Version 12 and analyzed using descriptive and inferential statistics.

3.6 Descriptive Analysis

3.6.1 Trend Analysis

Trend analysis is at the core of coming up with ways to predict future events, the term chosen by the researcher and used here can possibly be used to estimate an uncertain phenomenon in the past (Immerwahr, 2004). Detecting a trend over a well-defined period of time can cause and indeed mostly makes any researcher come up with valuable insights for strategizing and making conclusions that can dictate the future and deliberate cause of action.

Trend analysis can also help identify the dominant features, patterns and traits on the phenomena under study. Specifically, in this study, trend analysis made us understand thoroughly from a salient observation and obtain deeper insights on how raising, lowering or maintenance of the curve in public debt, that is domestic and external debt and the subsequent debt servicing expenses can have an impact on the growth of the Kenyan economy. It is also paramount to strategize on where to adjust in the existing balance and the monetary policy and fiscal policy currently in order to come up with an optimal policy which can yield optimally with the available resources. Moreover, each economy has distinct features and therefore it is important to have this observation of trends in different economies moral to identify the special features and characteristics of the economics under study.

3.7 Time Series Analysis

The study applied time series model, to be specific, Autoregressive distributed lag model was employed in order to come out with a deep analysis on the effect of the three variables on economic growth in Kenya. The application of time series model in the study was deemed to be called for owing to how it incorporates different aspects.

3.8 ARDL Model Analysis

The study carried out diagnostic testing to ensure that the data set does not violate any of the time series assumptions to ensure this, unit root tests, cointegration tests were undertaken as discussed below. The initiation of the autoregressive distributed lag (ARDL) method or Bounds test was due to Pesaran and Shin (1999), while its further development was due to Pesaran et al. (2001). It is acknowledged as one of the most flexible methods in the econometric analysis

of the energy-growth nexus, particularly when the research framework is shaped by regime shifts and shocks. The latter change the pattern of energy consumption or the evolution of covariates in the energy-growth models. Moreover, the fact that the ARDL method may tolerate different lags in different variables, this makes the method very attractive, versatile, and flexible.

The ability to host sufficient lags enables best capturing of the data generating process mechanism. This translates into that the method can be applied irrespective of whether the time series is $I(0)$, namely stationary at levels, $I(1)$ namely stationary at first differences or fractionally integrated. Nevertheless, within the ARDL framework, the series should not be $I(2)$, because this integration order invalidates the F-statistics and all critical values established by Pesaran. Those have been calculated for series which are $I(0)$ and/or $I(1)$. Furthermore, the ARDL method provides unbiased estimates and valid t-statistics, irrespective of the endogeneity of some regressors (Harris and Sollis 2003; Jalil and Ma 2008). Actually, because of the appropriate lag selection, residual correlation is eliminated and thus the endogeneity problem is also mitigated (Ali et al. 2016).

As far as the short-run adjustments are concerned, they can be integrated with the long-run equilibrium through the error correction mechanism (ECM). This occurs through a linear transformation without sacrificing information about the long-run horizon (Ali et al. 2017). One other aspect is that the method allows the correction of outliers with impulse dummies (Marques et al. 2017, 2019) and the approach distinguishes between dependent and independent variables. Lastly, the interpretation of the ARDL approach and its implementation is quite straightforward (Rahman and Kashem 2017) and the ARDL framework requires a single form equation (Bayer and Hanck 2013), while other procedures require a system of equations.

The ARDL approach is more reliable for small samples as compared to Johansen and Juselius's cointegration methodology (Haug 2002). Halicioglu (2007) also mentions two more advantages of the method, which are: The simultaneous estimation of short- and long-run effects and the ability to test hypotheses on the estimated coefficients in the long-run. This is not done in the Engle–Granger method. The Autoregressive distributed lag model (ARDL) was the identified model fit for the data. The optimal lag length was first obtained by use of Johansen Trace and Eigen value test. To examine the causal relationship between Economic growth, and public debt and its components that is External Debt and Domestic debt and debt servicing, the study intended to use causality test. Once the lag order had been identified, the formula as shown below was applied.

$$\Delta Y_t = \alpha_0 + \sum_{i=1}^p \alpha_{1i} ECGROWTH_{t-1} + \sum_{i=1}^q \alpha_{2i} Domdebt_{t-1} + \sum_{i=1}^q \alpha_{3i} ExDebt_{t-1} + \sum_{i=1}^q \alpha_{4i} DSVX_{t-1} + \varepsilon_t$$

Where:

$$\Delta Y_t = \begin{bmatrix} \Delta EXDEBT_t \\ \Delta DOMDEBT_t \\ \Delta DEBTSVX_t \end{bmatrix}$$

$\Delta EXDEBT_t$ represents the change of External Debt at time t.

$\Delta DOMDEBT_t$ represents the change in Domestic Debt at time t.

$\Delta DSVX_t$ represents the change in public debt servicing at time t.

$\alpha_0, \alpha_1, \alpha_n$, are matrices of coefficients.

3.9 Diagnostic Tests

This study applied time series method to analyze the data and the results. Since the data was time series in nature, estimating on moving variables could have produced spurious results with high R^2 and t-statistics. Diagnostic tests like autocorrelation, serial correlation and unit root tests were done on the data to ensure that the data conforms to the requirements of Time series data and fitting it into a model does not give rise to spurious or unmeaningful results which do not give the actual position of the issue that was under review. The following diagnostic tests were carried out.

3.9.1 Stationarity tests

Regression analysis based on time series assume that the series are stationary. However, time series are normally non-stationary in. Regression of time series on non-stationary data leads to spurious results and biased if they are heteroskedastic or autocorrelated. This study will use Dickey Fuller (DF) and Augmented Dicky-Fuller (ADF) to test stationarity of the time series data. In this test, if the absolute ADF test statistic is less than the absolute critical values, then we do not reject the null hypothesis of non-stationarity. Time series necessitates a check for unit roots in every series before equation estimation. If there is a unit root then the series is considered to be non-stationary.

The Augmented Dickey-Fuller (ADF) test for checking unit roots was employed in this study. In accordance with standard practice, this study checked whether or not the variables were stationary. The test was determined by comparing the critical value and the absolute test statistic, a critical value is a point on the test distribution that is compared to the test statistic to determine whether to reject the null hypothesis. If the absolute value of test statistic is greater than the critical value, we declare statistical significance and reject the null hypothesis.

3.9.2 Optimal Lag Selection Order

Pesaran and Shin (1999), opined that in ensuring that the ARDL model is fitted using the most suitable number of lags for the underlying data being analyzed, Optimal Lag Order Selection should be done. The Optimal Lag was selected using the Likelihood ratio test (LR) which compared a ARDL with p lags to one with $p-1$ lags, Final Prediction Error Criterion (FPE) which picked the lags with smallest value this was done to minimize the prediction error and information criterion (IC) which includes Akaike Information criterion (AIC), Bayesian Information Criterion (BIC), Hannan Quinn Information Criterion (HQIC) and the Schwarz Bayesian Information Criterion (SBIC) all the Information Criterion picks lags with the smallest value to be the lag order was undertaken.

3.9.3 Correlation

Correlation is a statistical measure indicating the extent to which two or more variables move together. Correlation coefficients indicate the strength of the linear relationships between variables. In case there is autocorrelation in the error terms which leads to unbiased estimates which cannot be analyzed by DF, ADF will be applied as a substitute to DF which assumes that the data generated under the null hypothesis is an AR (1).

3.9.3.1 Serial and Autocorrelation Tests

Serial correlation shows the relationship between a given variable and lagged versions of itself over time intervals. This was done to test the stability of the model after fitting. The Durbin Watson test was carried out to determine whether there was serial correlation hence the model was a good fit.

3.9.4 Cointegration

The basic inkling behind cointegration is that if all the variables of a vector time series process have a unit root, or in other words, if the series is a multivariate $I(1)$ process, there may exist linear combinations Tz_t without a unit root. These linear combinations may then be interpreted as long-term relations between the components of z_t (stochastic process), or in economic terms as static equilibrium relations.

Two variables, x and y are said to be cointegrated of order one $CI(1,1)$ if both are integrated of order 1 and there exists a linear combination of the two variables that is stationary, $I(0)$.

There are two tests that are used to test for cointegration, one by Engle and Granger (EG) (1987) and the other Johansen (1988). Johansen maximum likelihood (ML) procedure is a multiple equation method that permits the identification of the cointegration space using a canonical correlation method which enables the testing of how many cointegration relationships exist. Johansen ML procedure is superior to EG test since it corrects some shortcomings that EG suffers from, mainly being a two-step test in which errors in the first step are carried over to the second step. However, all these tests for cointegration are carried out when the data is integrated of the same order. In this case the Bounds test for cointegration was preferred since the variables were found to be integrated of different orders. The presence of one cointegrating relationship permits the use of Engle and Granger (1987) error correction model to test for Granger causality.

3.9.5 Bounds Test for cointegration

The ARDL cointegration approach was developed by Pesaran and Shin (1999) and Pesaran et al. (2001). It has three advantages in comparison with other previous and traditional cointegration methods. The first one is that the ARDL does not need that all the variables under study to be integrated of the same order and it can be applied when the under-lying

variables are integrated of order one, order zero or fractionally integrated. The second advantage is that the ARDL test is relatively more efficient in the case of small and finite sample data sizes. The last and third advantage is that by applying the ARDL technique we obtain unbiased estimates of the long-run model (Harris and Sollis, 2003). The Bounds test of cointegration was used in order to empirically analyse the long-run relationships and short run dynamic interactions among the variables of interest (Domestic debt, External Debt, Debt servicing and economic growth), we apply the autoregressive distributed lag (ARDL) cointegration technique as a general 10 vector autoregressive (VAR) model of order p, in Y_t , where Y_t is a column vector composed of the four variables: $Y_t = (ECGROWTH_t \text{ DomDebt}_t \text{ EXDebt}_t \text{ DSVX}_t)'$. The equations used were as follows:

$$\begin{aligned} \Delta ECGROWTH_t = & \alpha_{0i} + b_{11}ECGROWTH_{t-1} + b_{21}Domdebt_{t-1} + b_{31}ExDebt_{t-1} + b_{41}DSVX_{t-1} + \sum_{i=1}^p \\ & \alpha_{1i}\Delta ECGROWTH_{t-1} + \sum_{i=1}^q \alpha_{2i}\Delta Domdebt_{t-1} + \sum_{i=1}^q \alpha_{3i}\Delta ExDebt_{t-1} + \sum_{i=1}^q \alpha_{4i}\Delta DSVX_{t-1} \\ & 1 + \varepsilon_t \dots \dots (1) \end{aligned}$$

$$\begin{aligned} \Delta Domdebt_t = & \alpha_{0i} + b_{11}ECGROWTH_{t-1} + b_{21}Domdebt_{t-1} + b_{31}ExDebt_{t-1} + b_{41}DSVX_{t-1} + \sum_{i=1}^p \\ & \alpha_{1i}\Delta ECGROWTH_{t-1} + \sum_{i=1}^q \alpha_{2i}\Delta Domdebt_{t-1} + \sum_{i=1}^q \alpha_{3i}\Delta ExDebt_{t-1} + \sum_{i=1}^q \alpha_{4i}\Delta DSVX_{t-1} \\ & 1 + \varepsilon_{2t} \dots \dots (2) \end{aligned}$$

$$\begin{aligned} \Delta ExDebt_t = & \alpha_{0i} + b_{11}ECGROWTH_{t-1} + b_{21}Domdebt_{t-1} + b_{31}ExDebt_{t-1} + b_{41}DSVX_{t-1} + \sum_{i=1}^p \\ & \alpha_{1i}\Delta ECGROWTH_{t-1} + \sum_{i=1}^q \alpha_{2i}\Delta Domdebt_{t-1} + \sum_{i=1}^q \alpha_{3i}\Delta ExDebt_{t-1} + \sum_{i=1}^q \alpha_{4i}\Delta DSVX_{t-1} \\ & 1 + \varepsilon_{2t} \dots \dots (3) \end{aligned}$$

$$\begin{aligned} \Delta DSVX_t = & \alpha_{0i} + b_{11}ECGROWTH_{t-1} + b_{21}Domdebt_{t-1} + b_{31}ExDebt_{t-1} + b_{41}DSVX_{t-1} + \sum_{i=1}^p \\ & \alpha_{1i}\Delta ECGROWTH_{t-1} + \sum_{i=1}^q \alpha_{2i}\Delta Domdebt_{t-1} + \sum_{i=1}^q \alpha_{3i}\Delta ExDebt_{t-1} + \sum_{i=1}^q \alpha_{4i}\Delta DSVX_{t-1} \\ & 1 + \varepsilon_{2t} \dots \dots (4) \end{aligned}$$

The bounds test is mainly based on the joint F-statistic which its asymptotic distribution is non-standard under the null hypothesis of no cointegration. The first step in the ARDL bounds approach was to estimate the four equations (1, 2, 3 and 4) by ordinary least squares (OLS). The estimation of the for equations tests for the existence of a long-run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables, i.e., : $H_0: b_{1i} = b_{2i} = b_{3i} = b_{4i} = 0$ against the alternative one : $H_1: b_{1i} \neq b_{2i} \neq b_{3i} \neq b_{4i} \neq 0$ for $i= 1, 2, 3, 4$. We denote the F-statistic of the test and two sets of critical values for a given significance level can be determined (Pesaran et al., 2001). The first level is calculated on the assumption that all variables included in the ARDL model are integrated of order zero, while the second one is calculated on the assumption that the variables are integrated of order one.

CHAPTER FOUR

ANALYSIS FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter gives an analysis of data, the overall findings and discussions based on the data used. It describes in details the characteristics of the data, the results, the tests carried out and endeavors to be the basis of conclusions that will be arrived at therein.

4.2 Data Characteristics

The study used monthly time series data for the period 2001-2019. Nominal data for these variables was collected from the World Bank Statistics and Kenya Economic Surveys, The Central Bank and the Kenya National Bureau of Statistics respectively. Data was collected for the variables including External debt (EXTDebt), Domestic Debt (DOMDebt) Total interest service (DEBTSVX). Real data was derived by taking the quarterly change in the variables. Gross Domestic Product (ECGROWTH).

Descriptive statistics give summaries about the sample and they form an essential basis for every quantitative data analysis as it is used to tell whether the sample is normally distributed or not Descriptive statistics also indicate whether there are outliers in the data or not. The actual data for estimation is attached at the appendix. Descriptive statistics of the data are presented in table 4.2.1 below

Table 4.2.I: Summary of Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	kurtosis
Year	19	2010	5.63	2001	2019		
DomDEBT	76	3.85	7.09	-5.61	33.44	2.0	9.1
EXDebt	76	2.85	5.07	-8.91	22.50	0.5	4.9
DebtSVX	76	44.34	91.60	-100	236.29	0.05	2.2
ECGROWTH	76	2.52	4.18	-12.2	11.6	-1.4	6.3

The average increase in Domestic Debt across the study period was 3.83%, External debts averaged at 2.85, Debt service on average were at 44.34 and Economic growth at 2.52%. This basically means that although debt and its subsequent servicing has been gradually increasing it has not had a negative effect on the growth of the Economy as it still grew at an average of 2.52 in the sample period. This is in line with the statement in Chapter 1 that Kenya's economy has not seem to be affected by the increments in debt.

The maximum year in the data was 2019. 2019 was also the year when external debt increased largely this increase was largely on account of Kshs 200 billion of International Sovereign Bond (ISB) borrowed during the fiscal year 2017/18. Debt service also had a maximum increase of 236.67% in 2019 as a result of higher stock of external commercial debt maturing in 2017/18. Further, the increase was largely on account of more repayments done during the year on external syndicated debt (G.O.K, 2019).

There are several advantages however, of having high government debts. The main one being that it allows the government have more funds than it had had if it were to work with the only the revenue raised which has sometimes fallen short creating a deficit. It is imperative that if the government is to increase debts, then the funds should be put into prudent use and ventures that will produce returns that will support the government in servicing the debt. A second advantage is that it allows the government to be flexible in fiscal policy lack of debt,

leaves the government with a hard time in stimulating the economy during a recession. Lack of debt gives a negative indicator on the credit-worthiness of the nation. Presence of debt allows the country to be able to fund its emergency borrowing needs without having to pay high interest rates. On the other hand, however, there needs to be caution while borrowing.

For instance, Begg et al (2000) noted that if the debt is grown to the highs, the government may be forced to impose high tax rates to offset the debt and that if the government goes to a point where it is unable to raise tax rates, the large unpaid debt may lead to huge budget deficits which will now lead the government to borrow more or print money on a massive scale. This would result into hyperinflation situation which would then crumble the economy rather than stimulate it to growth or revival.

Skewness is a measure of symmetry or the lack of it. Skewness is the tilt in the distribution and should be within the -1 and +1 range for normally distributed series which is very close to zero. The skewness for a normal distribution is zero. External debt and debt servicing had a skewness between the acceptable range of -1 and +1 and are thus said to have a normal distribution while the rest of the variables had a skewness above the range which is in line with the notion that economic data is non-normal.

Kurtosis is the peakness of a distribution and should be within -3 and +3 range when data is normally distributed. Kurtosis is a measure of whether the distribution is peaked or flat relative to a normal distribution. Data sets with high Kurtosis tend to have a distinct peak near the mean, decline rather rapidly and have heavy tails. Data sets with low Kurtosis tend to have a flat top near the mean rather than a sharp peak. A uniform distribution would be the extreme case. Kurtosis is also a measure of how outlier-prone a distribution is. The kurtosis for a normal distribution is 3. Distributions that are more outlier-prone have kurtosis less than 3. From the

above table, only debt servicing had a kurtosis of between -3 and 3. However, all the other variables had a kurtosis outside the +/- 3 meaning that there were outliers found and this shows that the Kenyan case of domestic and external debt and economic growth has experienced much shifts basically as a result of different economic and or socio-political factors this may include but may not be limited to new governments, new policies, country stability and availability of debt.

4.3 Trend Analysis

After data collection, coding and prearrangement, the researcher observed different forms as shown below. Under trend analysis new sectors about the economy keep on picking up within the current market dynamics of the country. Areas like the information communication technology (ICT) popularly known as the fourth industrial revolution, the mobile phone and the crypto-currency industries are some of the new areas that have had an effect on the gross domestic product in the country. New sectors will eventually affect the trends because the government will want to tax, support financially through quotas and /or build on where the private investment trend is headed. Trend analysis in this study was used to illustrate the general movement in the variables of the study across the period of consideration. The findings are illustrated in subsequent sections.

Domestic Debt

Figure 4.3.1 below shows that domestic debt has been increasing over the years. Domestic debt hit an all-time high in the year 2019 this is as a result of the introduction of mobile bonds (M-Akiba) in the preceding year. 2010 was also a significant year especially in the third quarter which saw domestic debt hit the 2trillion mark this was as a result of the introduction of internal borrowing in order to increase the control the supply of money in the economy. The year 2010 also witnessed the introduction of long-term bonds by the government and uptake of a 25-year

bond in 2009/2010 financial year and a 30-year bond in 2010/2011 financial year could have led to the sharp increase in domestic debt. These long-term bonds comprised of 19% of the total domestic debt. Overall, across the period under review, Domestic debt had an average of 3.85%.

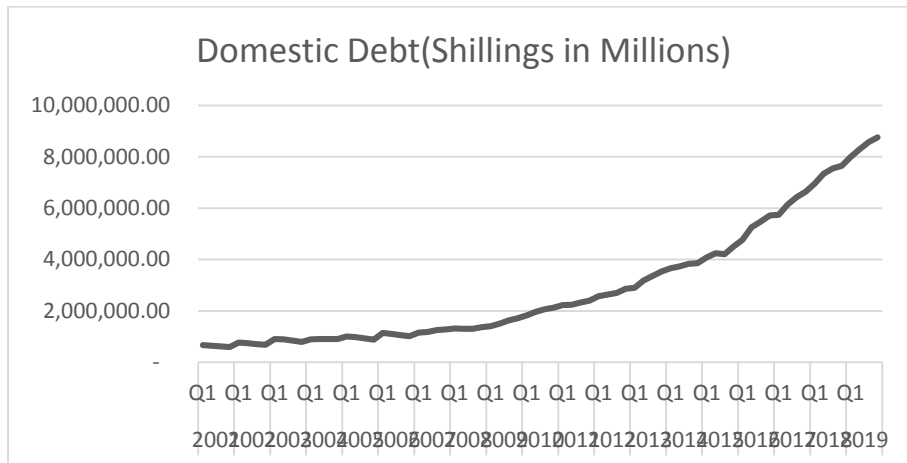


Figure 4.3.1; Domestic Debt Trend analysis

External Debt

From the descriptive statistics table, generally, external debt grew at an average of 2.85% in the period between 2001 and 2019. External debt also registered an all-time high in the year 2019. The increase was attributed to disbursements from commercial syndicated loans, multilateral and bilateral creditors as well as foreign exchange rate movements. The increase in external debt was mainly explained by the infrastructural developments around the country resulting in the uptake of more loans in order to facilitate the government’s agenda. Figure 4.3.2 below shows the trend of eternal debt over the years.

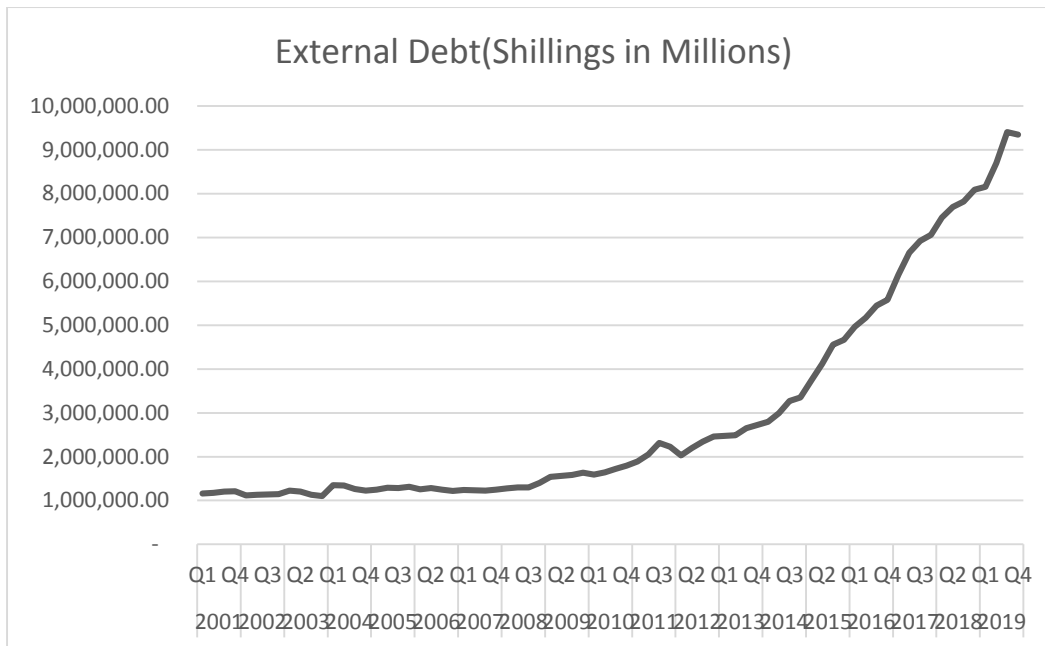


Figure 4.3.2; Trend graph- External Debt

Debt Servicing

Descriptive statistics showed that debt servicing had grown at a mean of 44.43% this is in line with the growth of both domestic and external debt hence the servicing as a result of the growth in loans should also increase. From the figure below, debt servicing hit a high in Quarter 3 of 2019 mainly on account of repayment of matured loans in that period. The fluctuations in debt servicing witnessed in the period as shown in Figure 4.3.3 below was due to different loans being due for payment in different quarters this is because not all interests on loans are paid at the same time hence some quarters will have high servicing costs than others.

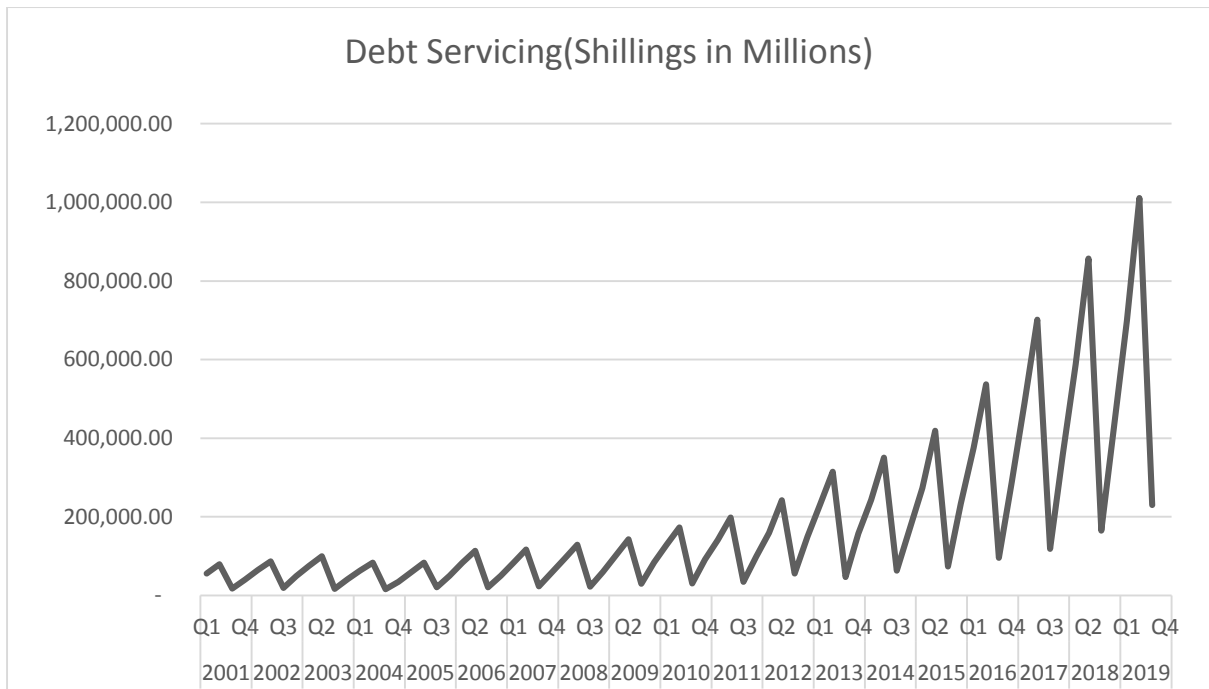


Figure 4.3.3; Trend graph- Debt Servicing

Economic Growth

From the descriptive statistics above, the economy grew at an average of 2.52%. Figure 4.3.4 below shows that economic growth has been on an unsteady rise in the period under review, starting with negative growth in the first quarter of 2001. Between 2002 and the third quarter of 2004, the economy had grown out of the negative effects and had a steady positive growth. This could be associated with the change of guard in the last quarter of 2002. However, there was a slow growth experienced in quarter 1 of 2008 which was highly explained by the political crisis in the country at the time. Post-election violence experienced in 2007 and early 2008 and the depression in world economies crippled the economy bringing it an average growth of 1.3% for the year due to the fact that businesses were closed down.

There was a significant growth in the year 2011 due to the promulgation of the new constitution which provided a conducive environment for businesses in the country. The influx

of infrastructural projects for instance, the Thika Road Super Highway helped in this as money borrowed had been used prudently, ensuring that the citizens could benefit in the eventuality.

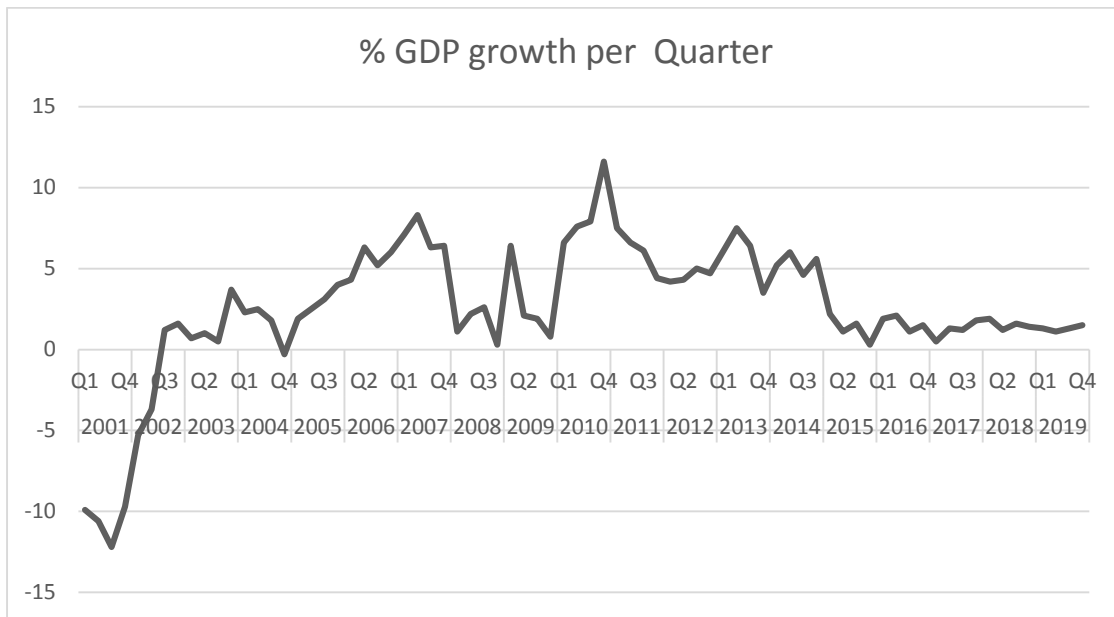


Figure 4.3.4; Trend Graph- Economic growth

Volatility

The data was analysed to test volatility and the output was as shown in the figure 4.3.5 below; There was volatility in Domestic debt, External debt and debt servicing. Economic growth did not have volatility as experienced in the rest of the data and hence the use of ARCH and GARCH models which require a data set to exhibit volatility in a high frequency data. Economic growth exhibited seasonality and hence ARCH and GARCH models were ruled out.

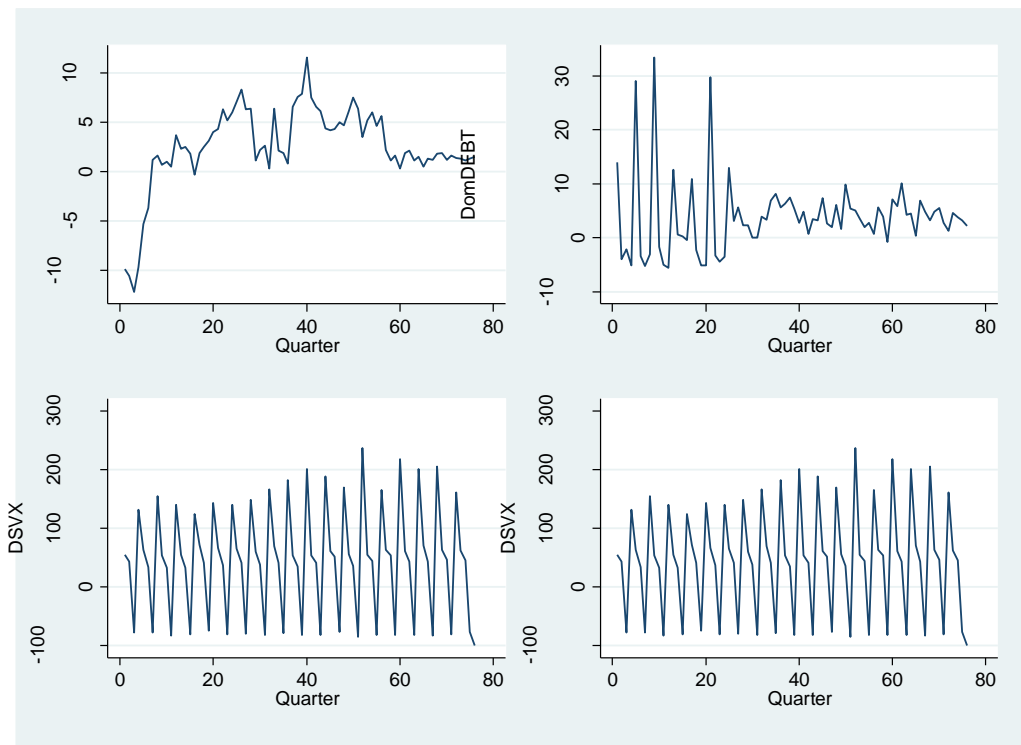


Figure 4.3.5; Volatility summary

4.4 Regression Model

This study used multivariate regression model to test statistical tests for heteroskedasticity and autocorrelation to examine how well the model fits to the data. Past studies have used a multivariate statistical model specification hence the need to test goodness of fit to the data, the results of the regression shown below were used to carry out diagnostic tests. From the Table 4.4.1 below, only 2.19% of the changes in growth are explained by the variables under discussion and on the 95% confidence index, none of the variables is significant in explaining growth of economic growth in Kenya.

Table 4.4.I: Regression Results

Source	SS	df	MS	Number of obs = 76		
				F (3, 72) = 0.53		
				Prob > F = 0.6626		
Model	28.3090287	3	9.4363429			
Residual	1280.02294	72	17.7780965			
Total	1308.33197	75	17.4444263			
				R-squared	= 0.0216	
				Adj R-squared	= -0.0191	
				Root MSE	= 4.2164	
ECGROWTH	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
DomDEBT	.0019821	.068916	0.03	0.977	-.1353996	.1393637
EXDebt	.1182836	.0962037	1.23	0.223	-.0734949	.3100621
DSVX	.0017782	.0053411	0.33	0.740	-.0088692	.0124256
_cons	2.098478	.6534962	3.21	0.002	.7957568	3.401198

Regression analysis based on time series assume that the series are stationary however time series are normally non-stationary. Regression of time series on non-stationary data leads to spurious results and biased if they are heteroskedastic or autocorrelated. The following analysis was done to determine the suitability of the data.

4.4.1 Stationarity / Unit Root tests

Since the study engaged time series data, it was imperative to undertake unit root test to test for stationarity of the data as most macro-economic time series data are known to be non-stationary. Estimating non-stationary variables at their levels most likely yields spurious results and no inference can be made since statistical tests such as the F-distribution and the t-distribution are invalid. Additionally, in running Autoregressive Distributed lag model, it is imperative to ascertain that none of the variables are integrated of order I (2) this is due to the fact that the ARDL bounds test is based on the assumption that the variables are I (0) or I (1). So, before applying this test, we determined the order of integration of all variables using the unit root tests. The objective is to ensure that the variables are not I (2) so as to avoid spurious

results. In the presence of variables integrated of order two, we cannot interpret the values of F statistics provided by Pesaran et al. (2001).

There are several tests for stationarity such as the Dickey-Fuller test, Augmented Dickey-Fuller (ADF) test, Phillip Peron test, among others. This particular study used the Augmented Dickey Fuller test. The ADF is widely used due to the stability of its critical values as well as its power over different sampling experiments.

Table 4.4.II:Stationarity results at levels

	ECGROWTH	DOMDEBT	EXDEBT	DEBTSVX
Test statistic	-3.321	-10.908	-7.236	-12.315
1% critical value	-3.545	-3.545	-3.545	-3.545
5% critical value	-2.910	-2.910	-2.910	-2.910
10% critical value	-2.590	-2.590	-2.590	-2.590
P value	0.01359	0.000	0.000	0.000

If the absolute ADF test statistic is smaller than the absolute critical values, then we reject the null hypothesis of unit root (non-stationarity).

The table above shows that all the variables except economic growth are stationary at all levels since the test statistic is smaller (more negative than the critical value) than the critical value. Economic Growth is not stationary at the 1% critical level but stationarity is obtained at the 5% and 10% critical levels since the absolute Augmented Dickey-Fuller Test statistic is greater than the critical value. The variable that was not stationary, that is economic growth, were therefore differenced.

On first differencing the absolute test statistic for economic growth was more negative than the critical value at all levels and stationarity was achieved, we therefore reject the null hypothesis of unit root tests (non- stationarity) and accept that all the variables are stationary (do not have unit roots). Since stationarity was achieved after 1st differencing concluded that the variables are integrated or order 1(0) for the response variables and I (1) for Economic

growth. This means that none of the variables are integrated of order I(2) and therefore, the Autoregressive Distributed lag(ARDL) could be used to fit the dataset.

Stationarity after 1st Differencing

Table 4.4.III: Stationarity results at levels

ECGROWTH	
Test statistic	-10.113
1%critical value	-3.546
5% critical value	-2.911
10%criticalvalue	-2.590
P value	0.000

4.5 Optimal Lag Order Selection

To carry out a bounds test of cointegration, the first step carried out was to find the optimal lag selection order for each variable. This helped in determining how many lags will be fitted per model. There was a consensus amongst a majority of the information criteria and the Final Prediction Error Criterion that the ARDL model should be fitted using four lags. However, since the study meant to analyse the effect of one variable to the other, the ARDL model was fitted with four as the maximum number of lags. The output was as shown in table 4.7.1 below.

Table 4.5.I: Optimal Lag Order Selection

Sample: 5 - 76					Number of obs = 72			
lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-1064.92				9.2e+07	29.6922	29.7426	29.8187
1	-1010.61	108.62	16	0.000	3.2e+07	28.6281	28.8799	29.2605
2	-988.152	44.92	16	0.000	2.7e+07	28.4487	28.9018	29.587
3	-916.929	142.45	16	0.000	5.8e+06	26.9147	27.5693	28.559*
4	-886.795	60.268*	16	0.000	4.0e+06*	26.5221*	27.3781*	28.6723

Maximum lag list

The data was then fitted as an ARDL model with a maximum of 4 lags in order to determine the optimal lag order for each variable in the different equations. A summary of the maximum lag list for each cointegration equation was as shown in the Table below. From the table, the variables do not have the same lags hence fitting a VAR or the restricted VECM model which requires model to have the same lag was not viable.

Table 4.5.II: Maximum Lag List

Independent variable	ECGROWTH	DOMDEBT	EXDEBT	DSVX
ECGROWTH	4	0	2	1
DOMDEBT	4	4	4	0
EXDEBT	4	0	4	3
DSVX	4	0	0	0

4.6 Bounds Cointegration test

On determination that the variables were not integrated of the same order and also not of order I(2), it was imperative that tests for cointegration are carried out to determine whether the variables are cointegrated. Thereafter the equations 1,2,3 and 4 as written in Chapter 3 above were applied. The null hypothesis of no cointegration is rejected when the value of the test statistic exceeds critical bounds value, while it is accepted if the F-statistic is lower than the critical value of the lower bounds. Other ways, the cointegration test is inconclusive. The use of this approach is guided by the short data span. From the optimal lag selection. We chose a maximum lag order of 4 for the conditional ARDL vector error correction model.

The calculated F-statistics are reported in Table 4.7.1 below when each variable is considered as a dependent variable (normalized) in the ARDL-OLS regressions. Their values are: for

equation (1), $F_{ECGROWTH} = 9.600$; for equation (2), $F_{DomDebt} = 6.561$; for equation (3), $F_{EXDebt} = 3.580$; for equation (4), $F_{Dsvx} = 0.705$. From these results, it is clear that there is a long run relationship amongst the variables when ECGrowth, Domdebt and EXDebt are the dependent variable because their F-statistics are higher than the upper-bound critical value (3.23) at the 5% level. This implies that the null hypothesis of no cointegration among the variables in these three (1) - (3), equations is accepted. However, for equation 4, the null hypothesis of no cointegration is accepted. A summary of the results of the bounds cointegration test are as shown in the table below;

Table 4.6.I: Summary of Bounds Test

DEPENDENT VARIABLE	F-STATISTICS		COINTEGRATION	What next?
	H0 Levels	Critical Levels		
ECG	F= 9.600 t= -5.564	I0= 3.23 I1= -2.86	YES	Fit ECM
DOMDEBT	F= 6.561 t= -4.819	I0=3.23 I1= -2.86	YES	Fit ECM
EXDEBT	F= 3.580 t= -3.594	I0= 3.23 I1= -2.86	YES	Fit ECM
DSVX	F= 0.705 t= -1.382	I0= 3.23 I1= -2.86	NO	Fit ARDL

4.7 Autoregression Distributed Lag- Error Correction Model Results

From the above results, it was determined that there were long run effects when economic growth, Domestic debt and External debt are set up as dependent variables while only debt servicing showed short run effects with no long run relationships between the variables in its equation. As a result of this long-run relationship in our main equation that is Economic growth, it was determined that the ARDL-ECM model would be fitted for this variable with the following equation;

$$\Delta ECGROWTH_t = \alpha_{0i} + \alpha_{1i} \Delta ECGROWTH_{t-1} + \sum_{i=1}^q \alpha_{2i} \Delta Domdebt_{t-1} + \sum_{i=1}^q \alpha_{3i} \Delta ExDebt_{t-1} + \sum_{i=1}^q \alpha_{4i} \Delta DSVX_{t-1} + \alpha_{5i} \Delta ECM_{t-1} + \varepsilon_t \dots (5)$$

An ARDL-ECM (4,0,2,1) was fitted and the results were as shown in the table below.

Table 4.7.I; ARDL output

ARDL(4,0,2,1) regression							
Sample:	6 -	76	Number of obs =		71		
			R-squared =		0.7044		
			Adj R-squared =		0.6551		
Log likelihood = -136.98484		Root MSE =		1.8123			
D.ECG	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]	
ADJ							
ECG							
L1.	-1.340338	.2408874	-5.56	0.000	-1.822185	-.8584917	
LR							
DomDEBT	-.0333616	.030009	-1.11	0.271	-.0933886	.0266655	
EXDebt	-.1416011	.054781	-2.58	0.012	-.2511794	-.0320228	
DSVX	.0038783	.0036067	1.08	0.287	-.0033362	.0110927	
SR							
ECG							
LD.	.1407323	.2098074	0.67	0.505	-.278945	.5604096	
L2D.	.2542795	.1691034	1.50	0.138	-.0839776	.5925366	
L3D.	.2979493	.1116083	2.67	0.010	.0746994	.5211993	
EXDebt							
D1.	.1079345	.0573947	1.88	0.065	-.006872	.222741	
LD.	.0919165	.045321	2.03	0.047	.0012609	.1825721	
DSVX							
D1.	-.0040293	.0028675	-1.41	0.165	-.0097652	.0017066	
_cons							
	.6479377	.373071	1.74	0.088	-.0983155	1.394191	

From the results above the adjustment term, (-1.340338) is significant with the correct sign showing that at the 5% level of significance, the errors from the last period would be corrected within the period. There also exist a long run relationship with economic growth and other variables though not significant at the 5% confidence level. In the long-run equation only

external debt was significant in explaining economic growth. A unit increase in external debt inversely affects economic growth by -0.1416011 *ceteris paribus*. The finding is in line with the conclusions made by Reinhart and Rogoff, (2010) in their paper, *Growth in a Time of Debt*, used Barro's Ricardian equivalence theory on a multi-country (44 countries) public debt historical dataset. It is true that external debt has a negative impact on economic growth, however it doesn't agree that the effect is not significant in low debt ratios (for ratios below 90% of GDP) as in this case, the negative effect is significant in both the short-run and the long-run. Further, the finding agrees with that of Were, (2001) that external debt buildup had an adverse impact on economic growth but only in the long run.

In the long-run, Domestic debt had a negative but insignificant relationship with economic growth at the 5% critical level while domestic debt has no particular effect on economic growth in the short-run. This finding does not agree with that of Njoroge, (2015) who found that public domestic debts have positive effects on the GDP. However, it is in line with the findings by Abbas and Christensen, (2009) while analyzing the role of domestic debt markets in economic Growth covering 93 low-income countries and emerging markets over 1975–2004 that gave proof that levels of debt beyond 35% of total bank deposits, have negative impact on economic growth.

The short-run equation, Economic growth is affected positively by its third lag and external debt. While debt servicing has an effect on economic growth in the short run, the effect is not significant this finding is in line with that of Musyoka, (2008) who found out that external debt servicing and debt servicing as a variable, had no effect on economic growth. The constant term was found not to be significant at the 5% critical level.

4.8 Post estimation Diagnostics

4.8.1 Serial Correlation

The Durbin Watson test carried out showed the result in table 4.9.1.I below and was determined that there was no serial correlation hence the model was a good fit. The result was further confirmed by the Breusch-Godfrey test as shown in and 4.9.1.II below;

Table 4.8.I: Durbin Watson test

Durbin-Watson d-statistic(11, 71) = 2.11665
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Table 4.8.II: Breusch Godfrey test for autocorrelation

Breusch-Godfrey lags(p)	LM chi2	test df	for autocorrelation Prob > chi2
4	4.489	4	0.3438

4.8.2 Test for Homoskedasticity

The model was also tested to establish whether the variance of its variables have the same finite variance. The results shown in table below show that the variables in the model had the same finite variance since the p value was greater than 0.05 at the 5% level of significance.

Table 4.8.III; White's test for homoskedasticity

white's test for Ho: homoskedasticity			
against Ha: unrestricted heteroskedasticity			
chi2(65) = 66.21			
Prob > chi2 = 0.4349			
Cameron & Trivedi's decomposition of IM-test			
Source	chi2	df	p
Heteroskedasticity	66.21	65	0.4349
Skewness	7.80	10	0.6480
Kurtosis	2.65	1	0.1036
Total	76.66	76	0.4571

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter contains a summary of the purpose of the research project, discussion of the results, conclusions and recommendations. The study relied on secondary data that was collected from the publications by KNBS and the National Treasury besides World Bank reports and publications. The discussion section interprets the results with reference to the research questions and the literature review. The conclusions given are based on the specific question of the research. The chapter closes with recommendations for improvement and areas for further research.

5.2 Summary of the Findings

Generally, the study was concerned with the ascertaining of the effect of public debt on economic growth (GDP) rates in Kenya. In specific, the study had the following objectives; ascertain the effect of External Debt on economic growth in Kenya; establish the effect of Domestic debt on economic growth in Kenya and to determine the effect of debt service on economic growth in Kenya. The study was guided by the following theories; The Debt Overhang theory, Crowding out effect and Keynesian economics.

Secondary data was collected for the period ranging from 2001 all through 2019. Collected data was Time series in nature and collected quarterly. A forced entry regression was run to analyse whether the data followed the requirements of Ordinary Least Squares. From the regression results, the model only explained 2.62% of the variations in economic growth for the period that was being researched.

The analysis of the collected data was conducted exclusively using Stata 12. The ARDL-ECM model was used during the analysis of the findings. Before carrying out the analysis, a number of diagnostic tests were carried out and the values of the results were within the required thresholds: Unit root test was carried out using the Augmented Dickey-Fuller test, to ascertain that the variables were integrate of different orders I (0) and I (1) and not of order I (2) while the Bounds test was used to test for cointegration. This was to analyse whether the variables were cointegrated or not when each of the variables are set up in an equation as a dependent variable.

From the findings, domestic debt, external debt, debt servicing were stationary at I(0) while economic growth was not stationary levels. However, Economic growth variable achieved stationarity after first differencing this is due to the fact that the test statistic was more negative than all critical values for the three levels of significance. The series under study was therefore said to be integrated of order 1(0) and I (1). The bounds test result showed that Economic growth, Domestic debt and External debt all had cointegrating equations while debt servicing had no cointegration in its equation.

The ARDL-EC model results showed that the only the coefficients of External debt and was statistically significant at the 5 percent confidence interval. This implies that there is a long run effect of external debt on economic growth albeit negatively. Debt servicing and Domestic debt had long run effects on economic growth though not significant. In the short-run, the lag of economic growth and external debt had effects on the growth of the economy. The model was also found to be stable using the tests for serial correlation and tests for homoscedasticity.

5.2.1 External Debt

The first objective of the study was to ascertain the effect of External Debt on economic growth in Kenya. From the Autoregressive distributed lags-error correction model results, Economic growth has a negative and significant effect on economic growth.

However, Kenya's debt external debt has not yet reached the alarming levels which make private investments to be crowded out as contended in the crowding out effect. It is important to note that if external debt is not monitored, crowding out effect could be a problem in the long run as there exists a negative effect to economic growth.

5.2.2 Domestic Debt

The second objective of the study was to establish the effect of Domestic debt on economic growth in Kenya. From the results of the Autoregressive distributed lag- error correction model, Domestic debt was found to have a negative but insignificant effect on Economic growth at the 5% confidence level but a significant effect at the 10% confidence interval. This means that an increase in domestic debt has a negative effect on economic growth. A unit increase in domestic debt decreases economic growth, *ceteris paribus*. Therefore, the uptake of domestic debt will lead to reduced growth in the short run and the effects wear off in the long run this goes against the explanations of the Keynesian theory that suggests there will be multiplication in the economy as a result of government spending from funds raised by domestic debt and spur total demand and this causes a multiplication effect of the initial investment hence spurring economic growth.

5.2.3 Debt Service

The third and major objective was to determine the effect of debt service on economic growth in Kenya. Results of the study from the ARL-EC model show that economic growth is not very

much affected by debt servicing. From the bound test results, there was no significant effect of shocks from Debt servicing to the economy either.

Additionally, there was no notable effect of debt servicing on economic growth. This is could be mainly due to the fact that debt servicing in Kenya is not high enough for a debt overhang situation to occur. In this regard, debt servicing is not at a level where it can cause a threat in economic growth and hence, the Kenyan government should not be in distress of experiencing debt overhang anytime in the foreseeable future.

5.3 Conclusions

The study concludes that public debt, in general, has no significant notable effect on economic growth. This is contrary to our expectation and the theoretical view because debt repayments in interest and principal are mostly raised from the revenue collected by the country. Public debt servicing is usually the first charge from the consolidated fund this means that even on times when revenue collection targets have not been made, debts must be serviced. This in essence reduces the amount of money left to fund other important government expenditures as a result, there will be high inflationary rates as a result of low money supply, investment will be discouraged and so the economy is expected to stagnate.

In this case, Public debt has no particular effect this can be explained by the fact that the variable utilised was not for total debt but clustered into domestic and external debt. Domestic debt repayment would essentially be reinvested hence overriding the negative effects of external debt servicing which is not reinvested in the country leading to a balance hence resulting in there being no significant effect on economic growth as private investments have not been crowded out thus the economy grows regardless of the servicing.

The results of the ARDL-EC established that external debt has a negative and significant effect on economic growth (GDP) rates. This is contrary to our expectations of a positive relationship. This means that as the government borrows more externally, the rate of economic growth will reduce. This is the current case in the country as the p value for external debt was significant. In spite of debt levels not being so high the negative effects of external debt will be felt in both the short and long run and may lead to levels where it stifles out private investments from the costs of its servicing.

It is also worth noting that this situation can be evaded by proper utilisation of external debt as is stipulated in the Public Finance Management Act that all external debt procured should only be used for development projects and not recurrent expenditure. The utilisation in development projects will lead to income generation leading to increased revenue which would make it possible to repay the loans without further straining the economy. Borrowing to repay another debt like in the case of utilising Eurobond funds to pay the syndicated loan in 2015 and finance recurrent expenditures will lead to an even more negative significant effect on the economy and should be discouraged.

Furthermore, the study established that domestic debt has a negative but insignificant effect on economic growth rates. This relationship was insignificant at the 5% significance level because the p-value was greater than 0.05%. Thus, a unit increase in domestic debt results into a decrease in economic growth rates which is inconsistent with the expectations. This means that in as much as domestic debt is good for the growth of the economy in theory, as money borrowed domestically is normally used prudently and also the repayments due are re invested into the economy, increasing the private investments. However, this does not mean that the good effect on economic growth will exist in the long run and that the country can

sustain high debt levels since if domestic debt levels are allowed to skyrocket, they can lead to crowding out and may cause an overhang in the overall debt levels.

The study found out that debt servicing has no effect on economic growth rates in the short term and long-term period. Based on this, borrowing for investments in infrastructural projects as proposed for in the Vision 2030, meant at ensuring that the country achieves a middle-income economy status should be encouraged. This is because there was no evidence of a debt overhang problem from the analysis.

5.4 Recommendations of the Study

The study found out that public debt, in general has no effect on economic growth rates in the short term and long-term period. Based on this, borrowing for investments in infrastructural projects as proposed for in the Vision 2030, meant at ensuring that the country achieves a middle-income economy status should be encouraged. This is because there was no evidence of a debt overhang problem from the analysis.

The study also recommends that proceeds from external debt should be utilised properly (For infrastructural developments and advancement of the social status of the people. This will help in revenue creation which will facilitate debt repayment. This is based from the fact that the research found that external debt negatively affects economic growth though the levels of the country's current debt are insignificant, it does not mean that higher debt levels will exhibit the same behaviour. It is therefore, prudent that external debt levels are controlled and capped in order for them not to reach the dangerous levels which will effectively lead to deterioration of the economy as there will be a crowding out effect and investors will not want to invest in a country whose economy does not grow.

The fact that the study also found that in the shortrun domestic debt has no effect on economic growth this however, does not mean that the country can withstand any level of debt as in the long-run, it has negative effects on economic growth. The government should only have a level of debt which is maintainable to ensure that the interest on domestic debt does not become greater than the GDP growth and to avoid crowding out other investments which are also crucial for economic growth.

5.5 Limitations of the Study

The study to determine the effect of public debt on economic growth was conducted and the following challenges were faced during the study:

5.5.1 Accessibility of Data

The study to determine the effect of public debt on economic growth, encompassed three independent variables; domestic debt, External debt and debt servicing that is interest and principal repayments on both debts. The research was limited to only these three independent variables although they were not the major explanatory variables for economic growth. This was due to the fact that data from the other monetary instruments was not available from any one document.

5.5.2 Data Inconsistency

This study involved review of secondary documents. Similar data from different institutions that is ministry of finance, central bank printed reports world bank debt reports and international monetary fund reports reviewed contradicted each other. As a result, the study relied on National Treasury data from the Annual Public Debt Management Reports for use.

5.5.3 Detailed Data

The study period of 2001 to 2018 was utilized since it was not possible to get complete data for the early nineties when the National Treasury was not preparing detailed debt data reports therefore it was not possible to obtain the detailed data for period 1991 to 2001, the data available was unverified and highly inconsistent.

5.6 Suggestions for Further Studies

The study was limited to analysing the effect of public debt and by extension included the determinants of public debt that is external debt stock, domestic debt stock and debt servicing on economic growth. The obvious area of further studies that can be carried out would be adding other determinants of economic growth on the model to see how they react to each other this are government expenditure, private investments, budget deficits etc in the period after the promulgation of the new constitution and the establishment of institutions. Future studies should also cover how the separate debt servicing affects economic growth that is analyse domestic debt and its debt servicing and external debt and its servicing and their influences on other economic concepts like Private investments and budget deficits.

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World Bank Development Indicators Online Data.

APPENDICES

Appendix 1: Research Gaps

Research	Variables used	Methodology and Findings	Research gap
Long term and short term relationships between public debt service and GDP In Indonesia Author: Cholifihani (2008)	Debt service, capital stock, labor and human capital	Applied Co integration analysis of time series model. The results found that Indonesia faced a debt overhang problem in the long run since increasing public external debt service slows economic growth	Used Debt service as a variable. The current study uses Domestic Debt, External Debt and total interest payable.
Impact of external debt on public investment and economic growth Author; Kibui, 2009	Debt service, external debt	Used Augmented growth model Debt service ratio is significant at explaining the GDP growth in Kenya	The study concentrated on external debt on public investment and economic growth and ignored domestic debt and interest payment variables
Analysis of external public debt servicing and economic growth in Kenya Author: Makau (2008)	Savings, interest payment, external debt, and annual growth rate of labour force	Used Ordinary least square method The findings indicated that the Kenya's external debt is mainly official and is significant	The study concentrated on public debt servicing on economic growth in Kenya and ignored domestic debt and interest payment
Domestic debt levels in low income countries against the GDP Author: Abbas & Christensen (2010)	Debt levels	Used granger causality regression model. The debt levels exceeding 35 % of total bank deposits have negative impact on economic growth.	Concentrated on debt levels only
The effect of external debt service payment practices on sustainable economic growth and development with particular emphasis on Nigeria. Author; Adesola, (2010)	Debt payment to Multilateral Financial creditors, Paris club creditors, London club creditors, Promissory notes holders	Ordinary least square (OLS) multiple regression method. The study found that debt payment to London club creditors, Paris club creditors, promissory notes holders and Other creditors have	Concentrated on External Debt and its servicing only

	and other creditors (Non-Paris Creditors)	significant impact on the GDP	
The relationship between Debt servicing and economic growth in Kenya. Author; Musyoka, (2008)	Total Debt servicing	ADF unit root tests. The study found out that economic growth was not very much affected by external debt servicing and that debt servicing as a variable, had no effect on economic growth	Concentrated on Debt servicing only.
Effect of domestic debt on private investment in Kenya Author: Achieng (2010)	Exports, Government national expenditure, debt service ratio and domestic debt	Used Johansen Co integration test, Granger causality test and Vector Error Correction model The findings indicated that the export Government national expenditure ratio, debt service and stock of domestic debt were significant at 5%	The research focused on domestic debt variable on private investment
The effect of domestic Public debt on economic growth in Kenya, Author; Njoroge, (2015)	GDP, Domestic Debt, Private Sector Credit	Used real quarterly time series data for Augmented Dickey-Fuller (ADF) test. The results show that while total debt has negative effects on economic growth, public domestic debts have positive effects on the GDP.	Focused on Domestic Debt
The Effect of External Debt on Economic Growth and Development of Nigeria Author; Ajayi and Oke, (2012)	National Income, Debt Service Payment, External Reserves, Interest rate	Using the ordinary least squares method found that High levels of external debt led to depreciation of the country's currency, increase in retrenchment of workers, endless industrial strikes and a deteriorated educational system.	Did not look at Domestic debt. Study carried out In Nigeria.
Were, (2001) The Impact of External Debt on Economic Growth in Kenya		Using time series data for the period 1970-95, indicated that external debt accumulation had a negative impact on economic growth	Focused on External Debt not debt servicing

Appendix 2: Raw Data

RAW DATA						
Year	Quarter	Domestic Debt(Shillings in Millions)	External Debt(Shillings in Millions)	Debt Servicing(Shillings in Millions)		% GDP growth per Quarter
2001	Q1	665,460.00	1,160,550.55	55,348.00		-9.9
	Q2	638,944.00	1,177,879.93	79,410.00		-10.6
	Q3	625,274.92	1,204,386.95	17,148.00		-12.2
	Q4	593,492.80	1,209,574.62	39,757.00		-9.7
2002	Q1	766,217.56	1,114,204.63	64,697.00		-5.3
	Q2	740,079.63	1,128,615.64	86,354.00		-3.7
	Q3	700,913.00	1,134,818.32	19,199.00		1.2
	Q4	679,459.00	1,143,969.37	48,805.00		1.6
2003	Q1	906,657.95	1,226,101.10	75,013.00		0.7
	Q2	891,024.03	1,207,591.13	99,759.00		1
	Q3	846,389.39	1,132,389.63	16,944.00		0.5
	Q4	798,895.82	1,101,424.75	40,696.00		3.7
2004	Q1	899,459.65	1,349,197.32	62,985.00		2.3
	Q2	904,886.04	1,343,510.22	83,136.00		2.5
	Q3	906,759.32	1,261,655.30	15,451.00		1.8
	Q4	902,632.76	1,228,611.96	34,581.00		-0.3
2005	Q1	1,001,229.02	1,244,917.30	59,205.00		1.9
	Q2	978,207.93	1,289,110.92	83,443.00		2.5
	Q3	927,708.77	1,281,797.79	20,599.00		3.1
	Q4	879,780.21	1,316,627.79	49,939.00		4
2006	Q1	1,141,680.09	1,257,089.71	83,012.00		4.3
	Q2	1,104,390.49	1,284,411.40	113,546.00		6.3
	Q3	1,055,549.24	1,244,262.29	20,929.00		5.2
	Q4	1,018,628.11	1,221,680.78	50,254.00		6
2007	Q1	1,150,240.28	1,243,033.88	82,872.00		7.1
	Q2	1,185,977.61	1,236,572.68	116,349.00		8.3
	Q3	1,252,965.41	1,228,259.66	23,464.00		6.3
	Q4	1,282,609.69	1,250,905.05	58,265.00		6.4
2008	Q1	1,311,541.66	1,275,268.09	93,329.00		1.1
	Q2	1,311,167.42	1,295,604.44	129,023.00		2.2
	Q3	1,310,971.33	1,299,433.70	22,420.00		2.6
	Q4	1,362,305.98	1,401,407.27	59,658.00		0.3
2009	Q1	1,407,912.68	1,540,733.99	100,924.00		6.4
	Q2	1,505,030.70	1,565,054.39	142,656.00		2.1
	Q3	1,628,197.13	1,587,202.50	29,714.00		1.9
	Q4	1,719,022.23	1,634,102.45	83,847.00		0.8
2010	Q1	1,827,350.40	1,589,079.92	128,708.00		6.6

	Q2	1,964,144.06	1,644,853.55	173,304.00	7.6
	Q3	2,070,553.54	1,723,331.83	30,463.00	7.9
	Q4	2,127,789.60	1,797,262.38	91,775.00	11.6
2011	Q1	2,230,916.15	1,888,852.93	141,353.00	7.5
	Q2	2,246,257.59	2,051,451.16	198,560.00	6.6
	Q3	2,322,840.22	2,312,831.48	34,431.00	6.1
	Q4	2,398,339.96	2,224,264.77	99,070.00	4.4
2012	Q1	2,574,442.23	2,026,098.48	159,281.00	4.2
	Q2	2,643,923.08	2,196,490.00	241,805.00	4.3
	Q3	2,696,290.98	2,341,607.33	55,515.00	5
	Q4	2,859,025.74	2,458,863.78	149,262.00	4.7
2013	Q1	2,903,997.02	2,472,577.31	232,744.00	6.1
	Q2	3,191,035.65	2,492,596.97	314,608.00	7.5
	Q3	3,363,395.58	2,652,103.51	46,883.00	6.4
	Q4	3,534,018.08	2,722,594.69	157,661.00	3.5
2014	Q1	3,661,501.24	2,798,232.05	243,152.00	5.2
	Q2	3,733,128.03	2,994,802.95	350,344.00	6
	Q3	3,838,412.95	3,268,467.76	63,201.00	4.6
	Q4	3,866,025.44	3,348,479.97	167,630.00	5.6
2015	Q1	4,085,071.17	3,738,207.12	272,738.00	2.2
	Q2	4,243,687.08	4,116,605.76	419,151.00	1.1
	Q3	4,209,930.74	4,554,055.05	73,573.00	1.6
	Q4	4,511,197.99	4,668,413.52	233,470.00	0.3
2016	Q1	4,774,525.34	4,966,877.74	375,135.00	1.9
	Q2	5,254,836.53	5,169,157.29	536,759.00	2.1
	Q3	5,479,126.93	5,449,976.73	95,537.00	1.1
	Q4	5,721,614.82	5,575,832.34	287,111.00	1.5
2017	Q1	5,741,168.50	6,145,037.89	489,306.00	0.5
	Q2	6,137,047.72	6,649,215.04	701,919.00	1.3
	Q3	6,432,557.68	6,925,512.71	118,217.00	1.2
	Q4	6,637,283.83	7,059,635.85	360,119.00	1.8
2018	Q1	6,957,159.26	7,453,027.46	588,246.00	1.9
	Q2	7,341,644.94	7,695,504.20	857,131.00	1.2
	Q3	7,547,587.02	7,817,808.83	164,951.00	1.6
	Q4	7,647,939.30	8,087,432.10	430,787.40	1.4
2019	Q1	7,998,094.70	8,158,363.20	699,377.19	1.3
	Q2	8,299,002.48	8,700,464.53	1,011,317.64	1.1
	Q3	8,570,808.75	9,405,368.08	230,179.05	1.3
	Q4	8,756,607.19	9,349,383.91		1.5

Appendix 3: Operationalized Data

Year	Quarter	DOMDEBT	EXDEBT	DSVX	ECGROWTH
2001	Q1	0.00	0.00	0.00	-9.90
	Q2	-3.98	1.49	43.47	-10.60
	Q3	-2.14	2.25	-78.41	-12.20
	Q4	-5.08	0.43	131.85	-9.70
2002	Q1	29.10	-7.88	62.73	-5.30
	Q2	-3.41	1.29	33.47	-3.70
	Q3	-5.29	0.55	-77.77	1.20
	Q4	-3.06	0.81	154.21	1.60
2003	Q1	33.44	7.18	53.70	0.70
	Q2	-1.72	-1.51	32.99	1.00
	Q3	-5.01	-6.23	-83.02	0.50
	Q4	-5.61	-2.73	140.18	3.70
2004	Q1	12.59	22.50	54.77	2.30
	Q2	0.60	-0.42	31.99	2.50
	Q3	0.21	-6.09	-81.41	1.80
	Q4	-0.46	-2.62	123.81	-0.30
2005	Q1	10.92	1.33	71.21	1.90
	Q2	-2.30	3.55	40.94	2.50
	Q3	-5.16	-0.57	-75.31	3.10
	Q4	-5.17	2.72	142.43	4.00
2006	Q1	29.77	-4.52	66.23	4.30
	Q2	-3.27	2.17	36.78	6.30
	Q3	-4.42	-3.13	-81.57	5.20
	Q4	-3.50	-1.81	140.12	6.00
2007	Q1	12.92	1.75	64.91	7.10
	Q2	3.11	-0.52	40.40	8.30
	Q3	5.65	-0.67	-79.83	6.30
	Q4	2.37	1.84	148.32	6.40
2008	Q1	2.26	1.95	60.18	1.10
	Q2	-0.03	1.59	38.25	2.20
	Q3	-0.01	0.30	-82.62	2.60
	Q4	3.92	7.85	166.09	0.30
2009	Q1	3.35	9.94	69.17	6.40
	Q2	6.90	1.58	41.35	2.10
	Q3	8.18	1.42	-79.17	1.90
	Q4	5.58	2.95	182.18	0.80
2010	Q1	6.30	-2.76	53.50	6.60
	Q2	7.49	3.51	34.65	7.60
	Q3	5.42	4.77	-82.42	7.90
	Q4	2.76	4.29	201.27	11.60
2011	Q1	4.85	5.10	54.02	7.50

	Q2	0.69	8.61	40.47	6.60
	Q3	3.41	12.74	-82.66	6.10
	Q4	3.25	-3.83	187.73	4.40
2012	Q1	7.34	-8.91	60.78	4.20
	Q2	2.70	8.41	51.81	4.30
	Q3	1.98	6.61	-77.04	5.00
	Q4	6.04	5.01	168.87	4.70
2013	Q1	1.57	0.56	55.93	6.10
	Q2	9.88	0.81	35.17	7.50
	Q3	5.40	6.40	-85.10	6.40
	Q4	5.07	2.66	236.29	3.50
2014	Q1	3.61	2.78	54.22	5.20
	Q2	1.96	7.02	44.08	6.00
	Q3	2.82	9.14	-81.96	4.60
	Q4	0.72	2.45	165.23	5.60
2015	Q1	5.67	11.64	62.70	2.20
	Q2	3.88	10.12	53.68	1.10
	Q3	-0.80	10.63	-82.45	1.60
	Q4	7.16	2.51	217.33	0.30
2016	Q1	5.84	6.39	60.68	1.90
	Q2	10.06	4.07	43.08	2.10
	Q3	4.27	5.43	-82.20	1.10
	Q4	4.43	2.31	200.52	1.50
2017	Q1	0.34	10.21	70.42	0.50
	Q2	6.90	8.20	43.45	1.30
	Q3	4.82	4.16	-83.16	1.20
	Q4	3.18	1.94	204.63	1.80
2018	Q1	4.82	5.57	63.35	1.90
	Q2	5.53	3.25	45.71	1.20
	Q3	2.81	1.59	-80.76	1.60
	Q4	1.33	3.45	161.16	1.40
2019	Q1	4.58	0.88	62.35	1.30
	Q2	3.76	6.64	44.60	1.10
	Q3	3.28	8.10	-77.24	1.30
	Q4	2.17	-0.60	-100.00	1.50

Appendix 4: Budget

	EXPENSES	APPROX AMOUNT(KSH)
1	Stationery (full scalps, biro pens writing proposal and project)	3,000
3	Transport, food and accommodation during literature review and transport to the library and meeting of the supervising lecturer	5,000
4	Collection and analysis of the data gathered	3,000
5	Typing of project, printing and binding	4,000
	Contingency expenses	5,000
	Total	20,000

Appendix 5: Time Schedule

Activity	Time
Concept Paper of research topic	February 2019
Writing of chapter one	March 2019
Presentation of chapter 1,2 and 3 to the supervising lecturer	March 2019
Adjustments and corrections	May 2019
Proposal Defense	June 2019
Adjustments and corrections	July 2019
Collection of Data	September2019
Analysis of data	November2019
Presentation of chapter 1-4 to the supervising lecturer	January 2020
Adjustments and corrections	February 2020
Presentation of chapter 1-4 to the supervising lecturer	March 2020
Defense for dissertation	April 2020
Corrections after defense dissertation	April 2020
Writing a final copy of the report	May 2020
