

**EFFECT OF EXTERNAL DEBT AND GOVERNMENT EXPENDITURE ON
ECONOMIC GROWTH IN KENYA**

BY

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DECLARATION

Declaration by Candidate

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DEDICATION

I dedicate this thesis to my parents, my husband and my children. May the Almighty God bless you abundantly.

ACKNOWLEDGEMENT

I thank the Almighty God for having sustained my life and seeing me through my studies at Moi University. My great thanks to my supervisors, Dr. Ernest Saina and Dr. Winrose Chepng'eno for their continuous and timely support and excellent guidance throughout the thesis writing process. I thank you for your intellectual comments that helped me further refine this thesis.

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ABSTRACT

Kenya is among the Sub-Saharan African countries, which are highly dependent on external debt to finance its developmental activities. Because of insufficiency in domestic revenue sources such as taxes, fines and fees to finance the budget deficit, the successive governments have to borrow not only domestically, but also externally to reduce the budget deficit gap or finance the productive capital projects such as roads, railways, ports, provision of water and production of energy. Scholars and experts have raised concern over the possibility of Kenya's external debt exceeding its sustainable threshold. This could easily stretch the country's repayment ability in future and may spill over to a negative impact on economic growth. The main objective of the study was to establish the effect of external debt and government expenditure on economic growth in Kenya. Specifically to investigate the effect of external debt stock on economic growth in Kenya, determine the effect of external debt service on economic growth in Kenya, determine the effect of government expenditure on economic growth in Kenya and finally determine both short-run and long-run relationship between external debt stock, external debt service and government spending on economic growth in Kenya. The study was guided by the Solow growth theory. Central Bank of Kenya, Kenya National Bureau of Statistics, International Monetary Fund and World Bank were the main sources of time-series data set. The study period was thirty-eight (38) years from 1980 to 2017, data stationarity was tested using Augmented Dickey-Fuller and Phillips Perron and the Autoregressive Distributed Lag approach was used to test for the null hypotheses. The study established that external stock ($\beta = -7.53$, $P = .0196$) and debt service ($\beta = -13.59$, $P = .047$) had negative significant effect on economic growth while government expenditure had a positive ($\beta = 26.97$) and significant ($P = .0385$) effect on economic growth. In addition, the study found a long-run significant ($F = 6.56 > 1(0) = 4.136$, $1(I) = 5.304$) relationship between the independent and dependent variables. The Error Correction Model test reveals a high speed of 112 percent (-1.115) of adjustment to equilibrium with significance ($P = .000$). The paired statistics reveal bidirectional causality in external debt stock and debt service, unidirectional causality between debt service and GDP, external debt stock and government expenditure, and debt service and government expenditure and between government expenditure and GDP, there was no causality. The study recommends a policy review and guideline on the use of externally borrowed funds to ensure that these funds are put into development projects. Further, policies on government expenditure to be directed to the productive sectors of the economy to appreciate the proper utilization of the external debts to boost the economic growth of the country. Finally, the study findings fill the knowledge gap existing in both empirical and theoretical literature related to external borrowing, debt repayments, government expenditure and economic growth.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT.....	v
TABLE OF CONTENTS.....	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
OPERATIONAL DEFINITIONS OF TERMS	xi
ABBREVIATIONS AND ACRONYMS	xiii
CHAPTER ONE	1
INTRODUCTION.....	1
1.0 Overview.....	1
1.1 Background of the Study	1
1.2 Statement of the Problem.....	4
1.3 Objectives of the Study.....	7
1.3.1 General Objective	7
1.3.2 Specific Objectives	7
1.3.3 Research Hypotheses	7
1.4 Significance of the Study	8
1.5 Scope of the Study	8
CHAPTER TWO	9
LITERATURE REVIEW	9
2.0 Overview.....	9
2.1 Global Debt Crisis.....	9
2.2 Kenya’s External Debt Situation	11
2.3 Theoretical Foundations.....	13
2.3.1 Solow Growth Theory.....	13
2.3.2 Keynesian Theory	15
2.3.3 Debt Overhang Theory	16
2.3.4 Crowding Out Effect Theory	17
2.3.5 Dual Gap Theory.....	17
2.3.6 Theoretical Model.....	18

2.4 Empirical Literature Review	18
2.4.1 External Debt Stock and Economic Growth	18
2.4.2 External Debt Service and Economic Growth	22
2.4.3 Government Expenditure and Economic Growth	24
2.4.4 Summary of Literature Review and Research Gap.....	27
2.5 Conceptual Framework and Hypotheses	29
CHAPTER THREE	30
RESEARCH METHODOLOGY	30
3.0 Overview	30
3.1 Research Design.....	30
3.2 Area of Study	30
3.3 Data Type and Sources	31
3.4 Data Analysis	31
3.5 Diagnostic Tests.....	32
3.5.1 Data Normality.....	32
3.5.2 Serial Autocorrelation.....	33
3.5.3 Heteroscedasticity Test	34
3.5.4 Multicollinearity Test.....	34
3.6 Data Stationarity	34
3.6.1 Augmented-Dickey Fuller Test.....	35
3.6.2 Phillips and Perron Unit Root Test	36
3.7 Lag Length Selection Criteria.....	36
3.8 Model Specification	37
3.8.1 Model Suitability Assessment.....	41
3.9 Granger Causality Test	41
3.10 Description and Measurement of Study Variables	42
CHAPTER FOUR.....	43
RESULTS AND DISCUSSION	43
4.0 Overview	43
4.1 Diagnostic Tests Results	43
4.1.1 Normality Test Results	43
4.1.2 Serial Correlation Test Results	44
4.1.3 Heteroscedasticity Test Results	45
4.1.4 Multicollinearity Test Results.....	46

4.1.5 Model Stability Assessment Results	47
4.1.6 Univariate Time Series Plots Results.....	47
4.2 Data Stationarity Test Results.....	50
4.2.1 Augmented-Dickey-Fuller Unit Root Test Results.....	51
4.2.1 Phillips-Perron Unit Root Tests Results	51
4.3 Optimum Lag Length Selection Results	52
4.4 Paired Causality Statistics.....	53
4.5 Descriptive Statistics Results.....	55
4.6 Correlation Analysis Results.....	56
4.7 Hypotheses Tests Results.....	57
4.8 ARDL Long Run Form and Bounds Test Results	61
4.9 Error Correction Model (ECM) Estimator Tests Results	63
CHAPTER FIVE	67
SUMMARY OF FINDINGS, CONCLUSIONS AND POLICY	
RECOMMENDATIONS.....	67
5.0 Overview	67
5.1 Summary of the Findings.....	67
5.3 Conclusions.....	68
5.4 Contribution of the Study.....	70
5.5 Policy Recommendations.....	71
5.6 Suggestions for Further Research	72
REFERENCES	73
APPENDIX.....	78
Appendix I: The Data used in the Study.....	78

LIST OF TABLES

Table 4.1: Breusch-Godfrey Serial Correlation LM Test	44
Table 4.2 Heteroscedasticity Test: Breusch-Pagan-Godfrey	45
Table 4.3: Variance Inflation Factors	46
Table 4.4: Augmented Dickey-Fuller Unit Root Tests (5% level of significance)	51
Table 4.5: Phillips Perron Unit Root Tests Test (5% level of significance)	52
Table 4.6: VAR Lag Order Selection Criteria	53
Table 4.7 Pairwise Granger Causality Tests	54
Table 4.8: Descriptive Statistics Results	55
Table 4.9: Correlations Analysis Matrix Results	56
Table 4.10: Autoregressive Distributed lag Regression Results	58
Table 4.11: ARDL Long Run Form and Bounds Test Results	62
Table 4.12 Error Correction Model Results	63

LIST OF FIGURES

Figure 2.1: Trend analysis of the study variables from 2006 to 2017	12
Figure 4.1: Normal distribution Tests Results	43
Figure 4.2 Model Stability Test —CUSUM Test:	47
Figure 4.3: Time Series Plot for Gross Domestic Product	48
Figure 4.4: Time Series Plot for External Debt Stock	48
Figure 4.5: Time Series Plot for External Debt Services	49
Figure 4.6: Time Series Plots for Government Expenditure	49

OPERATIONAL DEFINITIONS OF TERMS

- Crowding Out:** A situation where the economy operates near its capacity such that an increase in government borrowing causes the interest rate to rise, which reduces crowd out on private investment (Karagol, 2002). Ultimately, this reduces the economic growth because a higher amount of external borrowed capital goes to servicing of the external borrowings.
- Debt Overhang:** A scenario in which the debt burden is larger than the country's repayment ability and the anticipated debt service costs depresses further domestic and foreign investments (Krugman, 1988).
- Debt Service:** The total amount of cash needed at a particular period to repay both the principal amount of debt plus the interest (Adesola, 2009).
- Economic Growth:** It refers to the addition of the productive potential of an economy, which results in the economy's capability of producing more amounts of goods and services (Hunt, 2007). It is estimated as the change in the GDP of a country over one year, with inflation adjustment to allow for figures comparisons over time.
- External Debt:** Refers to the proportion of a country's debt borrowed from foreign lenders and represents the country's outstanding amount of liabilities that require a certain payment of principal plus interest in future (Adesola, 2009).

Government Expenditure: This is the purchase of goods and services, which include consumption, investments and transfer payments consisting of income transfers and capital transfers (Salih, 2012). It is the governments' procurement of goods and services utilized either currently or in the future.

Gross Domestic Product: This refers to the total value of all goods and services produced over a given period usually a year. It is a monetary measure of the market value of all final goods and services produced within a country's border at a specified time (Hunt, 2007).

ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criteria
ARDL	Auto-Regressive Distributed Lag
CBK	Central Bank of Bank
COMESA	Common Market for Eastern and Southern Africa
CUSUM	Cumulative Sum
DGP	Data Generating Process
DS	Debt Service
EAC	East African Community
ECM	Error Correction Model
EU	European Union
EXD	External Debt Stock
FPE	Final Prediction Error
GDP	Gross Domestic Product
GE	Government Expenditure
GNP	Gross National Product
HIPC	Highly Indebted Poor Countries
HQIC	Hannan Quinn Information Criterion
IMF	International Monetary Fund
JB	Jarque-Bera
LL	Log-Likelihood
LM	Lagrange Multiplier
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares

PP	Phillips Perron
SGR	Standard Gauge Railway
SIC	Schwarz Information Criterion
SSA	Sub-Saharan Africa
UK	United Kingdom
USA	United States of America
USD	United States Dollar
VAR	Vector Autoregressive
WB	World Bank

CHAPTER ONE

INTRODUCTION

1.0 Overview

This chapter presents the background of the study, statement of the problem, the study's objectives and research hypotheses, the significance of the study and the scope of the study.

1.1 Background of the Study

The ultimate goal of any government is to sustain and stabilize economic growth over time to improve the welfare of its citizens. Economic growth is the addition to the country's potential economy gross domestic product (GDP). The productive potential of an economy results in the economy's capability of producing more amounts of goods and services, which essentially explains why a given state grows at a different rate over different times (Gorodnichenko, 2010). Growth in the economy is essential because enterprises expand and translates to aggregate expansion in the output of the whole economy, which is measured as a change in the GDP of a country over a period of one year, with inflation adjustment to give room for comparisons of figures over the years. Over time, real growth in the economy leads to improved standards of living, expansion of the current and venturing into new markets, which is a very essential symbol for business opportunity (Wagner, 2007).

The GDP growth rate in the economy influences the government's choice of tax rates and expenditure levels to ensure smooth growth rates (Palmer, Wedgwood, Hayman, King, & Thin, 2007). Growth in the economy allows a business to employ more resources to match the expansion rate of production aimed at satisfying consumer increase in demand. However, if a negative growth is witnessed, cost-cutting measures

have to be taken to minimize loss-making possibilities, as consumers demand fewer commodities (Gorodnichenko, 2010).

The more a country produces, the more the ability to pay its citizens, which increases marginal propensity to consume. This ultimately increases the demand for goods and services with a multiplier effect, which depicts a greater wealth to the nation. However, in a country with negative growth, the production capacity drops, causing less income being generated which consequently lowers marginal propensity to consume which lowers the demand for goods and services and shrinks the country's economic growth (Palmer *et al.*, 2007).

To achieve the objective of economic growth, any sovereign nation needs a tangible amount of capital finance infrastructure and development of the productive capacity (Mbah, Ummuna & Agu, 2016). However, due to unavailability of adequate capital associated with lower savings culture, taxation or internal borrowing, many underdeveloped countries opt to borrow from external sources to bridge the gap between savings and investments. Governments world over borrow to finance expenditure with aim of increasing the social welfare and promote economic growth (Akram, 2011). Debt refers to the total amount of foreign and domestic borrowed funds. In other words, it is the total amount of direct government fixed-term contractual obligations to others, which can be either internal or external (Chowdhury, 2001).

External debt not only provides capital for industrial development but also managerial know-how, technology experts and venturing into international markets for mobilisation of a nation's material and human resources when it is used for growth-related activities (Reinhart, Reinhart & Rogoff, 2012). When external debt is borrowed prudently, it has the possibility of enhancing economic growth, capital accumulation and growth in productivity. However, it could lead to debt overhang if it accumulates

beyond a certain limit, by reducing economic growth (Chowdhury, 2001). This is a situation where, high levels of indebtedness discourage investment, which negatively affects growth as future tax revenues are used to repay debts (Baum, Westphal, & Philipp, 2013).

Burnside and Dollar (2000) pointed out that external borrowing for productive investment creates macroeconomic stability. However, a high level of accumulated debt hurts the rate of investment, savings and economic growth in general. If there is a likelihood that in future, the debt will be larger than the countries' ability to repay, then the anticipated debt service costs will depress the domestic and foreign investment (Krugman, 1988). Besides, debt obligations affect economic growth through crowding out effect, especially in a situation where the greater portion of foreign capital is used to service external debt, hence very little remains available for investment and growth (Karagol, 2002).

In most circumstances, the accrual of debt is due to increased government expenditure (GE) or an increase in the governments' budget deficit. When the governments' revenue is lower than the budget deficit, it creates a financing gap, which has to be filled through external or internal borrowing or grants. If filling the gap is through borrowing, then this creates a future debt obligation that the subsequent government has to honour. Even in the current times, external debt is still a subject of discussion among the economics theorists and practitioners because the economic growth rate of a country ought to be in line with its annual debt growth rate if it is to solve the problems associated with large stocks of debt accumulation (Kemal, 2001).

According to Were (2001), during the three decades beginning 1950s, arrears in the current accounts were not considered as a major issue and borrowing abroad by countries was encouraged to create a conducive environment for foreign investment to

enhance economic growth. In this way, limited attention was given to the liabilities side of the current accounts, which led to an increase in foreign debts of these countries. It was until when Mexico declared that it could not service its debts despite being an oil-exporting country, unilaterally announced a moratorium of 90 days, and asked for a rescheduling of its existing and new loans to accomplish its prior obligations. The issue of external debt and its service has become a matter of great importance and introduced the debt crisis debate since that time. Countries borrow externally more than internally because of the concessional nature of external debts (Ibrahim, 2015).

According to Ajisafe, Nassar, Fatokun, Soile & Gidado (2006), governments can monetize their debts by paying cash to evade payment of interest, which in the event of doing so the governments reduce the costs of interest and when this way is adopted more often, it leads to hyperinflation. High amounts of internal debts crowd out private investments hence constraining countercyclical fiscal policies' scope, which may lead to higher volatility and negative effects on the performance of an economy (Mutasa, 2003). Crowding out effect in underdeveloped countries is a common feature compared to the developed countries hence policies that provide autonomy of restructuring debt depending on the prevailing circumstance should be formulated in the developing countries (Omassoma, 2011).

1.2 Statement of the Problem

Economic growth is an addition of the productive potential of an economy, which results in the economy's capability of producing more amounts of goods and services, which essentially explains as to why a given state can grow at a different rate over different times. This growth rate in the economy influences the government's choice of tax rates and expenditure levels to ensure smooth growth rates (Palmer *et al.*, 2007). Growth in the economy is essential because enterprises will expand and translate to

aggregate expansion in the output of the whole economy, which is measured as a change in the GDP of a country over a period of one year, with inflation adjustment to give room for comparisons of figures over the years. Over time, real growth in the economy leads to improved standards of living, expansion of the current and venturing into new markets, which is a very essential symbol for business opportunity (Wagner, 2007).

World over the crucial goal of any government is to sustain and stabilize its economic growth over time. Economic growth refers to addition to the country's potential economy gross domestic product (GDP). According to Mbah, Ummuna and Agu (2016) any sovereign nation needs a tangible amount of capital finance to invest in infrastructure and development of the productive capacity. However, due to unavailability of adequate capital, which is associated with low savings culture, taxation or internal borrowing, many underdeveloped countries opt to borrow from external sources to bridge the gap between savings and investments. Government borrowing is done to finance expenditure, therefore increasing the social welfare and promote economic growth (Akram, 2011).

Kenya is among the Sub-Saharan African countries, which are hugely indebted according to World Bank (2017) report. The report alluded that Kenya generates insufficient domestic revenues from its internal sources such as taxes, fines and fees to finance the budget deficit. Therefore, the successive governments have had to borrow not only domestically, but also externally to finance capital projects such as roads, railways, ports, provision of water and production of energy. Some of the examples of the development projects financed were Standard Gauge Railway (SGR) and the construction of roads and more than half of the external credit is accounted for by multilateral creditors and worsened by further borrowing (IMF, 2016). This means that there is an increasing trend in external borrowing by the Kenyan government and in

sum, the external debt stood at 61 percent of GDP. This showed that the country depended highly on the external borrowing to finance its capital projects but not seen to increase economic growth (IMF, 2016). Great challenges are posed to the economy by high levels of external debt due to large amounts of export income being used to service debts instead of being invested domestically. This could lead to debt overhang, a situation where there is more debt than the ability to service. Besides, this may crowd-out private investments meaning that more of the government resources are used to pay debts than what is used for investment (Chowdhury, 2001).

The theoretical aspects of the study highlight the theories that neither fully supports the effects of external debt on economic growth. The sampled theories have different views on the effect of external debt on economic growth. Equivocally, the literature reviewed on the linkages between economic growth and external debt is unclear. Some studies report positive (Mustafa & Rifaqat, 2012; Akram, 2011; Were, 2001; and Gani, 1999) while others negative (Babu *et al.*, 2014; Aminu, Umary & Musa, 2013; Ogege & Ekpudu, 2010; and Polly, 2009; Elbadawi, Ndulu & Ndungu, 1996; Frimpong & Oteng-Abayie, 2006) relationships between external debt and economic growth. It is worth to note that the outcomes of the findings could be due to the non-uniformity of the independent variables, which different studies adopt and the contexts at which they are applied differs. Nevertheless, it is certain that external debt greatly affects the economic growth of a nation but inconclusive findings, which this study filled.

Despite several studies done, none of those reviewed was based on the Kenyan context. Most of the similar studies done in Kenya are not documented and therefore not traceable. From the above studies, there is evidence that no uniform results explain how external debt affects economic growth because some studies obtain positive relationships, others obtain negative relationships and others report mixed results.

Normally, the expectation is that when external debt increase, economic growth could follow with similar growth. Further, there is no consistency in earlier studies findings; hence, this study fills the research gap.

1.3 Objectives of the Study

Both the general and the specific objectives of the study were as presented below.

1.3.1 General Objective

The main purpose of the study was to determine the effect of external debt and government expenditure on economic growth in Kenya.

1.3.2 Specific Objectives

The specific objectives of the study were to;

- a) Investigate the effect of external debt stock on economic growth in Kenya.
- b) Determine the effect of external debt service on economic growth in Kenya.
- c) Determine the effect of government expenditure on economic growth in Kenya.
- d) Evaluate the long-run relationship among external debt stock, external debt service, government expenditure and economic growth in Kenya.

1.3.3 Research Hypotheses

The study tested the following null hypotheses;

- a) **H₀₁**: External debt stock has no significant effect on economic growth in Kenya
- b) **H₀₂**: External debt service has no significant effect on economic growth in Kenya
- c) **H₀₃**: Government expenditure has no significant effect on economic growth in Kenya
- d) **H₀₄**: There is no significant short-run and long-run relationship between external debt stock, external debt service, government expenditure and economic growth in Kenya.

1.4 Significance of the Study

Kenya depends on debt to finance its fiscal deficit and it has increasingly accumulated both internal and external debt over the years. The volume of outstanding external debt and ever-growing loan obligations is raising concern about future sustainability. Hence, it was important to establish the effect of external debt on economic growth. The study would help the Kenyan government to understand how external debt boosts economic growth when used prudently, otherwise if not, the country would remain poor because the repayment of the loan plus the interest may adversely affect the economy. It would also help in improving future developments by generating more knowledge and adding to the existing literature for those who would wish to carry out further research on the effect of external debt on economic growth.

1.5 Scope of the Study

The study was limited to determining the effect of external debt and government expenditure on economic growth in Kenya. This covered the annual time series data for all the respective economic variables spanning over thirty-eight (38) years from the period 1980 up to 2017. Auto-Regressive Distributed Lag (ARDL) bound testing model was applied to incorporate external debt stock, external debt service and government expenditure as the independent variables and GDP as the output dependent variable. The period 1980-2017 was considered because of a massive time-series data available for public scrutiny. World Bank, Kenya National Bureau of Statistics, Central Bank of Kenya, International Monetary Fund and other relevant secondary sources were used to obtain the data of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Overview

This chapter presents the preview of the global debt crisis, Kenya's external debt situation, theoretical foundation and empirical literature review. The chapter ends with a summary of the literature review, research gap and the conceptual framework aligned to the null hypotheses of the study.

2.1 Global Debt Crisis

The 1980s debt crisis affected adversely South America, the Eastern Bloc and this crisis affected the Asian Tigers such as Russia, Argentina, and Turkey in the 1990s with the meltdown in the economy started in 2007 that shook the global economy mainly the European Union (EU), United Kingdom (UK) and United States (US) (World Bank, 2013). The countries affected by this crisis experienced an increase in both domestic and external debt. This led to high investments than production, which left the borrowers with high debts (domestic & foreign, private & public) when the crisis burst out (IMF, 2012).

According to IMF (2012), developed countries have incurred debt in the past years. For example, as a percentage of GDP, the debt in Organization for Economic Cooperation and Development countries (OECD) was 74.2 percent in 2007 and it was estimated at an average of 112.5 percent, with the lowest ratio being Estonia at 14.5 percent and highest being 224.3 percent in Japan in 2014. As a whole, the debt ratio went up to almost 110 percent in 2012 from 70 percent during the 1990s in OECD Countries (WB, 2013). According to Aghion and Kharoubi (2007), the financial crisis of 2008 changed the debt situation in Europe and promoted an unprecedented and contagious debt crisis.

Between 2007 and 2011, net government debt as a percentage of GDP rose from 51 percent to 70 percent in Eurozone and from 42 percent to 73 percent in the USA, 38 percent to 74 percent in the UK and 82 percent to 130 percent in Japan. Before the beginning of the 20th century, the accumulation of large external debt stock was generally slow and incurred mainly due to wars (IMF, 2010).

During the late 1950s, a large number of countries in sub-Sahara Africa experienced financial crisis characterized by unsustainable fiscal deficits. During this time, however, the current accounts deficit were considered normal and countries were encouraged to borrow externally to finance their deficits and create a conducive environment that attracted foreign investment to boost economic growth. Here, little attention was paid to repayment ability of these countries which led to the debt crisis (Were, 2001). Excess external debt stock has led to slow growth in SSA leading to the weakening of growth and socio-economic development being adversely affected (Omassoma, 2011).

According to Ibrahim (2015), when there is slow growth, it makes debt repayment difficult hence more weakening of the economy. In the early 1980s, the debt crisis rapidly grew due to the global debt crisis. Due to this, there was over-borrowing in most of the developing African nations and the international banks increased their lending during the same period. Besides, the fall of the commodity prices especially petroleum rapidly increased the liability situation in SSA (IMF, 2011). According to Da Costa (1991), countries in SSA experienced the most serious problems in the repayment of external debt even though the magnitude of their indebtedness was small. This is because of their low incomes and the instability of their export earnings.

2.2 Kenya's External Debt Situation

To improve the industrial, agricultural and infrastructural base, Kenya has been relying heavily on external borrowing. The assumption is that economic conditions would improve; and expand economy leading to increased exports, which could yield more foreign exchange to repay the external debts. According to the Government of Kenya (2010) report, the GDP growth in Kenya slowed down to 0.23 percent in 2008 from 6.9 percent in 2007. This was partly associated with post-election violence that affected almost all sectors of the economy during the first quarter of 2008. Like the rest of the world, Kenya experienced an unexpected rise in food and oil prices in 2007 associated with the 2007/2008 financial crisis (Were, 2001).

According to the World Bank report (2017), the total debt in Kenya grew drastically in the years 2015 and 2017. The overall debt increased for example in 2015, the gross debt was 52 percent up from 44 percent in 2013 of GDP and half of the debt owed to external creditors. The commercial component of Kenya's foreign debt increased although most of it was on concessional terms (IMF, 2016). In 2015, the nominal value of external debt was 14.7 billion US Dollars (USD), an equivalent to 27.5 percent of GDP. The external debt in the past few years starting from 2012 trended as follows; 11.89 billion USD in 2012, 13.84 billion USD in 2013, 16.97 billion USD in 2014 and 19.76 billion USD in 2015, 22.33 billion USD in 2016 and 26.42 billion USD in 2017 (WB, 2017). This showed an increasing trend and implied that if the trend continued, it could have some negative effects on Kenya's economic growth due to the increase in debt service costs.

According to the World Bank (2017), the ratio of Kenya's external debt to GDP was 25.9 percent in 2006 and dropped to 24.2 percent in the year 2011. During the same period, GDP growth ranged between 6.5 in the year 2006 and 6.1 in 2011. The trend in

debt service ranged between 1.7 percent and 1.0 percent between 2006 and 2011 respectively and the trend dropped and fluctuated between 1.0 percent and 2.0 percent between 2012 and 2016. In the year 2012, the ratio of external debt increased from 23.7 percent to 31.9 percent in the year 2016 and 35.7 percent in 2017. GDP during this period ranged from between 4.6 percent and 5.9 in 2016 and 4.9 percent in 2017. Besides, GE as a percent GDP during the same period was 109.3 percent in 2006 and 117.2 percent in 2011 and between 2012 and 2017 was 113.3 percent 111.5 percent respectively. From the above trends, it was clear that in terms of the percentage in GDP, external debt increased relatively faster than GDP. The trend was as presented in figure 2.1.

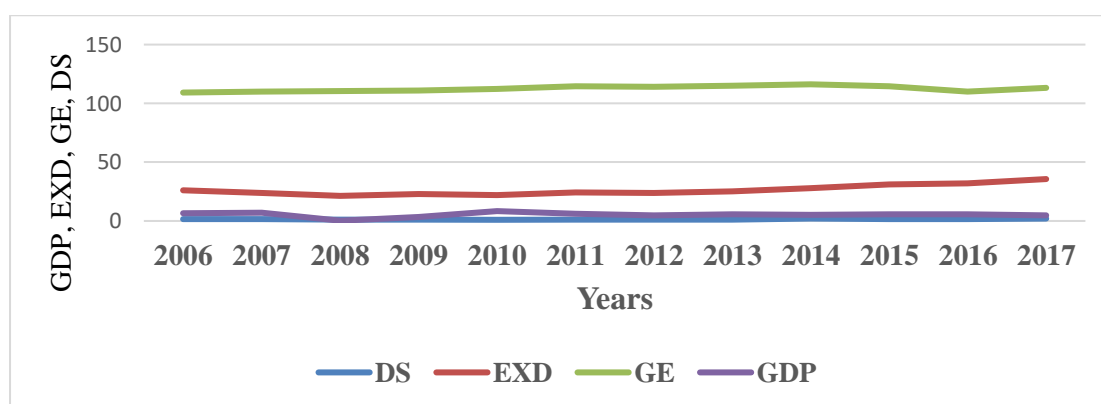


Figure 2.1: Trend analysis of the study variables from 2006 to 2017

Source: Research Data 2020

Figure 2.1 provided an insightful information that Kenya expenditure (about 60%) was financed domestically while about 40% was financed by external debt (World Bank, 2017). Seemingly, most of the spending went to consumption instead of capital projects. According to the World Bank (2017), the trend in external debt increased from US\$10,162.73M in 2011 to US\$26,423.65 M in 2017. Furthermore, the trend increased from 24.2 percent in 2011 to 31.9 percent in 2017. This was 35.7 percent of GDP. This depicted a rapid increase in external debt. Between the same periods, GDP grew by 6.1

percent in 2011, 5.8 percent in 2016 and 4.9 percent in 2017 (World Bank, 2017). This scenario extrapolated because Kenya obtained a semi-concessional loan from China to finance the first phase of the Mombasa-Nairobi of the SGR project and another US\$ 1.5 billion contract for the second phase of SGR that is Nairobi-Naivasha (CBK, 2017) and in 2018 USD 2 billion Eurobond. The rate at which external debt grew was not commensurate with GDP growth. Therefore, it was in light of the trend at which the external debt was increasing that motivated to carry out a study on the effect of external debt and government expenditure on economic growth in Kenya.

2.3 Theoretical Foundations

From the theoretical review, various schools of thought proposed different relationships between external debt, government expenditure and economic growth. The most relevant theories to this study were the Solow growth theory, the dual gap theory, the Keynesians theory, the debt overhang theory and the crowding out theory.

2.3.1 Solow Growth Theory

Solow Robert (1956) came up with a model that showed output per worker as an important variable to growth in labour productivity. In other words, the amount of output on average that a worker could produce in the economy. The model assumes that technology, labour and capital are the inputs used to produce outputs as was represented in equation 2.1.

$$Y = f\{A, K, L\} \dots \dots \dots (2.1)$$

Where: Y is the output: f is a function: A is technology, K is physical capital, L is labour.

The Solow growth theory postulates that there is only one homogeneous good produced and consumed by all countries and that technology is exogenous in the short-run. This

model built on a closed economy using labour and capital as inputs in the production function. This implied that through domestic saving that external debt affects economic growth and that savings were used for investment. Hence, the debt overhang and debt crowding effects were used separately to analyze the effect of external debt on the Solow growth model.

Accordingly, the debt overhang postulates that in debt amortization, there is a need for the government to increase the private sector tax rate to transfer resources to the sector. On the other hand, this reduces private sector investments because the expenditure on infrastructure reduced due to the diversion of the resources to service external debt. In addition, the total investments of both private and public sectors would reduce which shifts both the curves of investment and production function downward in the Solow growth model.

As for the debt crowding out, it was assumed that revenue from exports was utilized to clear outstanding debts and to service future external debts, hence very little was left available for domestic investment. Those countries, which used proceeds from exports for debt repayment, do discourage investment. This slowed down the economic growth and caused a downward effect in the curves of both the investment and production function in the Solow growth model. Based on the above arguments, the study adopted the Solow model due to the expectation that when external debt accumulates it hurts economic growth and that debt servicing harms economic growth due to crowding-out effect. Government Expenditure was incorporated in the model as a form of investment and therefore the above function was as presented in equation 2.2.

$$GDP_t = f(EXD, DS, GE) \dots\dots\dots (2.2)$$

Where: GDP is economic growth, EXD is external debt stock, DS is external debt service, and GE is government expenditure.

This theory was relevant to this study in that external debt borrowed to finance debt deficit, development investments and infrastructure. The neoclassical theory formally brought external debt as a variable to explain growth and opined that internal debt reduced the available capital stock due to the substitution of debt for physical capital. According to endogenous growth models, both fiscal and monetary policies play an important role in determining the potential economic growth.

2.3.2 Keynesian Theory

According to Keynes (1936), the economic growth rate was determined by investments and savings growth. The author argued that if a country's savings is low, then it affected the rate of investments, which consequently affected the rate of economic growth. This, therefore, led to a country with low savings to borrow from external sources to finance its investments.

This theory postulated that there was no actual burden regarding foreign debt. The effect of external debt was always in line with the growth of the economy as long as its application was productive economic activities. The theory recognized the usefulness of external debt compared to the domestic debt in that it could be put into long-term income-generating projects with the caution of repayment in the mind of the government representation. In addition to this, domestic debt owed internally, hence it does not add to a nation's resource base, but external debt is different in that it adds resources to the economy and has to be repaid for some time.

When the government increases its tax to meet the increase in its expenses, an immediate macro-expansionary effect experienced in the economy and this causes a lower multiplier effect as opposed to expenditures financed through external debt. However, external debt has no contractionary effect on macro terms (Savvides, 1992).

This theory was relevant to this study since the country with external debt would concentrate on the payment of debts, which normally have high-interest rates and not on investments, which affect economic growth. Besides, using the right analytical tools and data from reliable sources, the study would confirm the arguments posed in the theory as true in the Kenyan situation.

2.3.3 Debt Overhang Theory

Myers (1977) proposed the theory and stated that both external debt stock and its service costs inhibited growth by preventing private investment or changing the components of government spending. When the payment of interest rates is high, it led to a country's budget deficit increase and if the private savings did not increase to counter the difference between the public and private savings, it caused the interest rates to either increase or crowd out the available credit for private investment. This, in turn, led to a depression of the economy. External debt servicing discourages the investment of the available resources in infrastructure and human capital (Clements, Bhattacharya & Nguyen, 2003). Furthermore, it stated that debt could be non-linear, hence affected growth through capital accumulation or productivity growth.

Based on this theory, there was a possibility that a country's repayments ability would be lower than the debt in future. Investing further internally or externally was discouraged by the expected costs of debt service. In this case, investors would not be willing to produce more due to the fear of future tax (Krugman, 1988). This theory was relevant to the study in that if borrowing was increased it could cause debt overhang effect leading to the government being unable to pay the debt when it falls due.

2.3.4 Crowding Out Effect Theory

Claessens (1996) pointed out that when there is a decrease in available assets for funding investments and macroeconomic activities in a country, it led to a decrease in investments. The theory considered individuals to be planning their consumption decisions over the entire lifecycle. Borrowing increased the current consumption by shifting the tax burden to future generations. This school of thought assumed full employment, which implied that an increase in consumption would decrease savings, which would cause an increase in interest rates in the capital markets to restore the equilibrium. The consequences of the high interest rates, in turn, would be a decline in private investments, increased real exchange rates and high inflation. A situation in which the economy is operating near its capacity such that increased government borrowings to finance budget deficits causes the interest rate to rise and reduces crowd out on private investment (Karagol, 2002). Ultimately, this reduced the economic growth because a higher amount of external borrowed capital goes to servicing of the external borrowings. Crowding out effect mostly occurs when the real interest rates charged are high yet the terms of trade of a highly indebted country become worse although external credit markets may no longer exist.

2.3.5 Dual Gap Theory

The theory postulates that investment is a function of savings because, in the third world countries, internal savings levels are not sufficient to fund the desired investment to make sure that there is development in the economy. Therefore, it was prudent to complement external borrowings. However, the acquisition of finances from external sources would depend on the relationships that existed among the internal savings, investment, and economic growth. The simple guiding principle was that it was advisable to acquire external funds as long as the finances obtained from abroad would

lead to a higher rate of return compared to the borrowing costs (Ajayi & Khan, 2000). This implied that when this guiding principle was adhered to, the country that borrowed would utilize foreign savings to increase its capacity and expand its output. This theory was relevant to this study because Kenya has to borrow to fill the savings-investment gap.

2.3.6 Theoretical Model

This study adopted the Solow growth theory to guide the study. The theoretical model seems appropriate due to the expectation that when there is an accumulation of debt, it could be harmful to economic growth and that debt service cost harms economic growth due to the crowding-out effect. The study incorporated government spending in the model as a form of investment and therefore modelling the Solow function to fit the current study. This study evaluated as to whether the theory could hold even after introducing government expenditure into the prediction model.

2.4 Empirical Literature Review

This part reviewed the relevant empirical studies related to external debt stock, debt service, government expenditure and economic growth.

2.4.1 External Debt Stock and Economic Growth

The IMF (2005) report explained the channels through which external debt and debt relief affected economic growth in Highly Indebted Poor Countries (HIPCs). The study concluded that a considerable decrease in the stock of external debt projected for HIPCs would directly increase the per capita income growth by one percent per annum and the reduction in external debt service could offer an indirect boost to growth through their special effects on investments. Further, the study suggested that if half of all debt

service relief was channelled for such purposes, without raising the budget deficit, then growth might speed up in some HIPC's by an additional 0.5 percent per annum.

In Asian countries, Mustafa and Rifaqat (2012) investigated the impact of external debt accumulation on economic growth in Pakistan. The study used Gross National Product (GNP), human capital, capital formation, total labour force and foreign debt as study variables. The study adopted the extended production function model and found a long-run relationship between external debt and economic growth. This meant that high external debt stock ratio to GDP led to low economic growth rate and therefore it was evident that there was a debt overhang situation in Pakistan. Contrary to this study, Chowdhury (2001) carried out a study on the dual association of foreign debt and economic advancement in two Asian economies and concluded that there was a bi-directional relationship between external debt stock and growth of GDP, while there was no causal relationship between GDP growth and external debt stock. The conflicting results could be due to the different variables used in different models. The current study used a different model, ARDL to estimate the relationship.

Shah and Pervin (2012) examined the effect of external debt stock on economic growth in the short-run and long-run for 1974 to 2010 period in Bangladesh, using Ordinary Least Square (OLS) method. The results indicated that in the short-run, external debt affected GDP positively and therefore there was no evidence of debt overhang so long as external debt stock does not negatively affect economic growth. Nonetheless, there was crowding out effect due to the negative effect of debt service to creditors because of debt stock accumulation, which caused the service payment to increase. These findings conflicted with a study done by Gani (1999) which investigated the burden of external debt in the South Pacific Island countries and concluded that excessive

borrowing was associated with serious difficulties hence a hindrance to economic growth.

In Sub-Saharan African (SSA), Elbadawi, Ndulu & Ndungu (1996) examined the linkages that existed between external debt, investment and growth using non-linear fixed effect panel estimation. The data used was a cross-section of 99 developing countries inclusive of SSA countries using a growth and investment equation model. Their findings were in support of the current debt inflows enhancing economic growth while past accumulated debt inhibiting growth theory. The results gave an evidence of both debt overhang and crowding out effect because excess foreign debt burdens economic growth and investments in developing nations. Investigations by United Nations Economic Commission for Africa (1998) as cited by Iyoha (1999) were in the support of the conclusions made by Elbadawi *et al.* (1996). This study was different because it was country-specific and therefore shaded some light specifically on Kenya as a country.

Using a simultaneous equation model and simulation method to give room for debt and economic growth interactions, Iyoha (1999) examined the debt overhang hypothesis and economic growth in SSA countries. The variables used in this study were GDP, labour force and per capita gross investment. The results showed significant debt overhang effects as well as crowding-out effects. The study argued that large stocks of debt obligations had a detrimental negative effect on private investment in SSA. Besides, the results indicated that huge stocks of debt reduced investment hence lowering the rate of economic growth. This study was similar to the study in that it was testing for the existence of debt overhang but it was different in the sense that the model adopted was different, the variables used were not the same and also it was a panel data study.

Frimpong and Oteng-Abayie (2006) investigated the impact of external debt stock on economic growth in Ghana. The study covered the period 1970 to 1999 using GDP, domestic investment, external debt, debt service, export capacity and FDI as variables. The study adopted a multivariate co-integration approach. This was to examine the existence of debt overhang and crowding out effect. The findings showed that debt inflows positively influenced GDP, affirming the existence of crowding out effect and debt overhang. This study was similar to the current study in that some variables used were the same as those used and it was country-specific. However, was different due to the different models adopted by the two studies.

Sulaiman and Azeez (2012) carried out a study to find out how external debt affected economic growth in Nigeria, using GDP as the dependent variable and external debt as a ratio of exports, inflation and exchange rate as the independent variables for the period 1970 to 2010. OLS method of analysis used and the results indicated that there was a positive contribution of external debt stock to the economy of Nigeria. This study was different due to the model and variables adopted by the researcher. Ogege and Ekpudu (2010) utilized the time series data for the period 1970 to 2007 to examine how the debt burden affected Nigeria's economy. The results showed a negative relationship between external debt stock and GDP, meaning that an increase in debt stock would lead to a reduction in the growth rate of the Nigerian economy.

Babu, Kiprop, Kailio and Gisore, (2014) investigated how economic growth was affected by external debt in East African Countries (EAC). The study used annual data for the period spanning 1970 to 2010 and employed the Solow growth model augmented for debt. The study variables were terms of trade, openness and external debt. The findings suggested that external debt stock adversely affected the per capita

growth in EACs. The study was different in terms of regional contextual, use a time series data, different variables and model adopted.

Were (2001), investigated the impact of external debt on economic growth in Kenya, using time series data for the period 1970-1995. The variables for the model were the real GDP growth rate; the stock of external debt to GDP, stock of external debt to GDP lagged by one period, debt service, foreign financing, and private investment, Terms of Trade, human capital development, inflation, real exchange rate and investment and confirmed a debt overhang situation in Kenya. The current study borrowed a lot from this study due to the sample, however, differed in terms of the variables adopted, the model and the period of study.

Mbah, Umunna and Agu (2016) undertook a study on the impact of external debt on economic growth in Nigeria using ARDL approach for the period 1970-2013. This was to find the existence of a long-run relationship among the variable, employed GDP, the ratio of external debt to GDP, the ratio of debt service to GDP, the ratio of national expenditure to GDP and real exchange rate as the study variables. The findings of this study were that there existed a long-run relationship between the variables and that there was debt overhang and crowding-out effects in Nigeria.

2.4.2 External Debt Service and Economic Growth

Akram (2011) investigated the impact of debt on the economic growth of Pakistan for the period 1972 to 2009, using an Autoregressive Distributed Lag (ARDL) technique in estimating the model. The variables used in this study were GDP per capita, investment, external debt, domestic debt, openness and debt service. The empirical results indicated that there was a debt overhang situation in Pakistan, which concurred with other studies by Malik, Hayat and Hayat (2010) which reaffirmed that debt service and cost of borrowings adversely associated with economic advancement. This study

was similar to this the study at hand in that, a similar model was employed in testing the variables but was different in terms of the variables adopted and geographical context.

Frimpong and Oteng-Abayie (2006) in an attempt to establish the existence of debt overhang and crowding-out effects in Ghana for the period 1970 to 2010 carried out a study to find out how the external debt affected economic growth. The variables in their study were a domestic investment, external debt, debt service, export capacity and FDI and adopted a multivariate co-integration approach. The findings show that GDP positively related to debt inflows and negatively with debt servicing hence the existence of crowding out effect and debt overhang found through the negative impact of the domestic investment. This study was similar to the current study in that some variables used were the same as those used and it was country-specific. However, it differed due to the different models adopted by the two studies.

Polly (2009) carried out a study on the impact of debt on investment and economic growth using a time series data for the period covering 1970 to 2007 and adopted the reduced form growth model. The findings of this study showed that since 1982 the important indicators were above the critical levels. The empirical results indicated that the significant variable affecting the growth of GDP in Kenya was debt service ratio and that there was a negative relationship between investment and external debt stock as a percent GDP and debt service. Chowdhury (2001) investigated the relationship between indebtedness and economic growth using a Vector Autoregressive model (VAR). The finding showed that debt servicing as a percentage of export earnings or GDP affected the growth rate of GDP per capita adversely. In contrast, a study was done by Swamy (2015) observed a positive effect of debt services on economic growth

and associated this positive finding with trade openness, final consumption, expenditure and gross fixed capital formation.

Zaman and Arslan (2014) estimation results revealed that external debt services had a positive relationship with economic growth of Pakistan. Given that, external debts services do have positive effects on economic growth, but the problem occurs when countries have to repay these in future. The crowding-out effect of external debt rose from higher debt service which increased interest cost and the budget deficit, hence reducing savings and led to increased interest rates or competition for credit and therefore crowded out private investments and dampening economic growth (Clements *et al.*, 2003). The principal loan repayment and the interest servicing made debts accrued. External indebtedness became a ceaseless poverty aggravation mechanism in developing economies (Nakitami & Herera, 2007).

2.4.3 Government Expenditure and Economic Growth

Musgrave (1999) researched the growth of expenditure and the conclusion was that expenditure growth rate was very high at the beginning. This was due to the government providing the essential infrastructural facilities and these projects were mostly capital intensive, hence a steady increase in government. When the government spends in transport, power, water and education, the necessities that can push the economy from the initial stage of economic development, makes the government increase the amount of expenditure over time leading to an equitable society.

Alexander (1990), using a sample of 13 OECD nations panel, carried out a study for 1959 to 1984 period. The results depicted that when there was a growth in government spending it led to a significant negative effect on economic growth. Elsewhere, Devarajan and Vinay (1993) used a panel data of 14 advanced nations, undertook a

study covering the 1970 to 1990 period. The OLS model adopted the explanatory variables, which were various types of expenditure, which included health, education and transport. The findings were that health, transport and communication had a significant positive effect on economic growth whereas defence affected economic growth negatively.

Mitchel (2005) examined the effect of government expenditure on economic growth in advanced nations. Regardless of the model and the methodology employed, the conclusion was that large and growing governments were not favourable for performance. Further, the argument was that government downsizing would increase its incomes and led to the improvement of the competitiveness of Americans.

Gregorious and Ghosh (2007) used the heterogeneous panel data to carry out a study on how government expenditure affected economic growth. The outcome showed that higher economic growth was experienced by those nations with high government expenditure. To find out the direction and strength of the relationship between investment and economic growth, Olorunfemi (2008) carried out a study in Nigeria utilizing the time series data for 1975 to 2004 period. The observation was that there was a positive impact of expenditure on economic growth. Also, between gross fixed capital and GDP, there was no link. The study alleged that from the disaggregated analysis, the results indicated that only 37.1 percent of spending was of capital nature compared to 62.9 percent recurrent.

Wahab (2011) carried out a study on the effect of aggregate and disaggregate government expenditure on economic growth using a worldwide sample and the study used data from 97 developing countries for the aggregate government spending for the period covering 1960 to 2004 and the data used for the disaggregate government spending was for 1980-2000 period for only 32 countries. Symmetric and asymmetric

specifications were used and a positive output growth associated with aggregate government spending especially in the below-trend period was found. In addition, the findings suggested that government consumption spending had no significant output growth effects while government investment spending had positive output growth effect, particularly when its growth fell below its trend growth but the reverse experienced if government investment spending growth exceeded its trend-growth.

Hasnul (2015) undertook a study on the effect of government expenditure on the economic growth of Malaysia using OLS Econometric method. The variables for the study were GDP as the dependent variable, physical capital, labour force, openness and government expenditure as the independent variables. The study found that on overall government expenditure harmed the economic growth of Malaysia, but operating expenditure, education, defence and healthcare expenditures had no significant effect on economic growth. From the study, only expenditures depicted a negative effect on economic growth.

Attari and Javed (2013) explored the relationship between expenditure and economic growth in Pakistan using the time series data during the period 1980-2010. The study disaggregated government expenditure into the government current expenditure and government development expenditure. The result showed that the coefficient of government current expenditure was statistically insignificant, but the coefficient of government development expenditure was statistically significant. It showed that government expenditures yield positive externalities and linkages.

Nurudeen and Usman (2010) study adopted both the Keynesian and endogenous growth models and the finding from this study was that total capital expenditure, total recurrent expenditures, and government expenditure on education hurt economic growth. On the contrary, rising government expenditure on transport and communication increased

economic growth. Building on the same endogenous growth model with Nurudeen and Usman (2010), Hsieh and Lai (1994) determined the nature of the relationship between government expenditure and economic growth in G-7 countries, USA, UK, Canada, France, Germany, Italy, and Japan. The empirical result suggested that the relationship between government spending and growth vary significantly across time. They found no robust evidence of the positive effect of government spending on growth, neither have they found a robust negative effect. In conclusion, spending contributed a small proportion to the growth of an economy.

Wahab (2011) carried out a study to find out the effect of government spending on economic growth. The findings were that government spending had positive output growth effects particularly in periods of its below-trend growth. On contrary, Butkiewicz and Yanikkaya, (2011) studied the impact of government expenditures on economic growth that emphasized on how government effectiveness influenced the efficiency of government spending using Seemingly-Unrelated Regression technique. The result showed that total expenditures had a negative growth effect suggesting that developing nations should limit their governments' consumption spending and invest in infrastructure to stimulate economic growth.

2.4.4 Summary of Literature Review and Research Gap

The theoretical aspects of the study highlighted the theories that support the effects of external debt on economic growth. The main five theories were; Solow growth theory, dual-gap theory, Keynesians theory, debt -overhang theory and the crowding-out-effect theory. These theories have different views on the effect of external debt on economic growth. Therefore, this study fills the theoretical gap.

The literature reviewed showed that the linkage between economic growth and debt was unclear. Some studies reported positive relationships (Sulaiman & Azeez 2012; Mustafa & Rifaqat, 2012; Akram, 2011; Were, 2001; and Gani, 1999) while others reported negative relationships (Babu *et al.*, 2014; Aminu *et al.*, 2013; Shah & Pervin, 2012; Ogege & Ekpudu, 2010; Polly 2009; Frimpong & Oteng- Abayie, 2006; and Elbadawi *et al.*, 1996). Sulaiman and Azeez (2012) found a positive relationship between debt and economic growth while Shah and Pervin (2012) concluded that external debt service negatively affected economic growth but external debt had a positive effect. It is worthwhile to note that the outcomes of the findings could be due to the non-uniformity of the independent variables used in different studies and the contexts applied differently. Nevertheless, it was certain that external debt greatly affected the economic growth of a nation.

From the literature reviewed, different explanatory variables led to different outcomes in the study of economic growth and external debt. Despite several studies done, none of those reviewed was on Kenyan context. Either most of the similar studies done in Kenya were not documented and therefore not traceable. From the above studies, there was evidence that no uniformity of results that explained how external debt affected economic growth because some studies obtained positive relationships, others obtained negative relationships and others reported mixed results. The expectation was that when external debt increase, economic growth should also grow. There existed a research gap on the effect of external debt on economic growth and that were no consistent findings, hence this study filled the research gap.

2.5 Conceptual Framework and Hypotheses

The conceptual framework shows the relationship between the dependent and independent variables. The diagrammatical conceptual model was as presented in figure 2.1

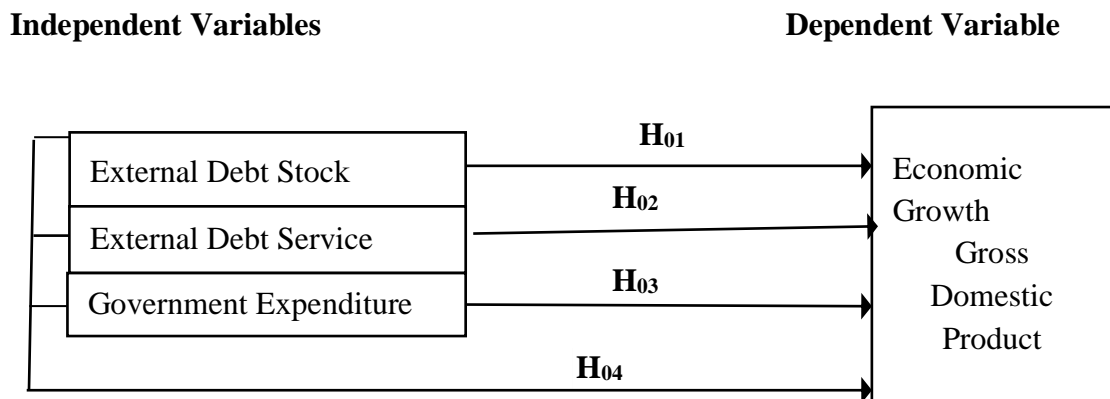


Figure 2.2: Conceptual Model

Source: Author 2020

In Figure 2.2, the arrows showed the direction of the hypothesis. The first objective of the study investigated the effect of external debt stock on economic growth. The arrow marked H_{01} tested the first hypothesis. The second objective was to evaluate the effect of external debt services on economic growth. The arrow marked H_{02} tested the second hypothesis. The third objective established the effect of government expenditure on economic growth. The arrow marked H_{03} tested the third hypothesis. The fourth objective established both long-run and short-run relationship between external debts, external debt service, government expenditure and economic growth. The arrow marked H_{04} tested of the null hypothesis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Overview

This chapter presented the intended methodology adopted in the study. The chapter comprised of the research design, the area of the study, data type and sources, data analysis, model specification and the diagnostic tests of the study.

3.1 Research Design

Research design refers to a blueprint, framework or arrangement used to obtain explanations to a research problem. It is a way of collecting and analyzing data in such a manner that is suitable for research purposes (Creswell & John, 2003). Building on the existing theoretical and empirical literature, the study employed a causal research design. The concern in causal relationship analysis is about how one variable could affect or change another variable (Cooper & Schindler, 2006). This is because it determines the cause-effect relationship between the dependent variable and the independent variables, that is, external debt stock, external debt service, government expenditure and economic growth respectively in this study.

3.2 Area of Study

The study focused on the effect of external debt and government expenditure on economic growth in Kenya. Kenya is one of the Sub-Saharan African countries experiencing high levels of external debt due to insufficient internal finance sources for development projects. In addition, there is evidence of low economic growth rates characterized by high unemployment rates, inadequate infrastructure and low standards of living. This, therefore, justifies as to why Kenya was the geographical area of the

study. Up to now, there is no clear information in Kenya about how external debt contributes towards economic growth; hence, there was a need to carry out this study.

3.3 Data Type and Sources

In order to analyze the effect of external debt stock, external debt service and government expenditure on economic growth in Kenya, the study used a data collection sheet to collect secondary data as the analysis tool. The study used annual secondary data for thirty-eight (38) years for the variables of interest from 1980 to 2017 period. The data for the study variables were sourced from a database held by World Bank, Central Bank of Kenya (CBK) and Government of Kenya publications. The researcher used secondary data sources because the variables adopted were macroeconomic in nature and the availability of these data from the secondary sources.

3.4 Data Analysis

Data analysis is the application of descriptive and inferential statistical procedures to understand the gathered data consistency (Zikmund, Babin, Carr, & Griffin, 2013). The study employed both descriptive and inferential statistics. Descriptive statistics involved the presentation of the study variables in form of tables, graphical charts and trends, while inferential statistics entails testing the hypotheses of the study. The analysis was on balanced time-series data for 38 years with the aid of E-Views software. The variables adopted were GDP growth to represent economic growth taken as the dependent variable, while external debt stock, external debt service and government expenditure constituted the independent variables. Correlation analysis assessed the magnitude of the relationship among the independent variables and the dependent variable while regression analysis carried out to understand whether economic growth could be predicted based on external debt stock, external debt service and government expenditure. Regression analysis models were used to establish the relationships using

a 2-tailed test at both 95 percent ($\alpha = 0.05$) and 99 percent ($\alpha = 0.01$) confidence level. The empirical analysis of this study was on the Autoregressive Distributed Lag (ARDL) technique, developed by Pesaran, Shin and Smith, (2001).

3.5 Diagnostic Tests

The regression assumptions need to be maintained to ensure reliability and validity in the estimation of coefficients and inferences statistics (Hoffmann, 2011). These assumptions include data normality, autocorrelation and heteroscedasticity, stationarity and model specification.

3.5.1 Data Normality

Normality is one of the OLS basic requirements, which assume that error terms have an asymmetric distribution. Violation of this requirement may lead to a flawed hypothesis testing due to exaggerated test statistics. Non-normality occurs when the data distribution is not bell-shaped. Bowman and Shenton initially proposed Jarque-Bera (1975) normality test. To investigate whether the data variables followed a normal distribution the study adopted the Jarque-Bera (JB) test, Jarque and Bera (1980). When using this test, a null hypothesis of normal distribution was tested against the alternative of non-normal distributions (Gujarati, 2004). This was hypothesized as; $H_0: JB = 0$ (normally distributed) and $H_1: JB \neq 0$ (not normally distributed). This was illustrated by equation 3.1

$$JB = n [S^2/6 + (K-3)^2/24] \dots \dots \dots (3.1)$$

Where ; n number of observations, S sample Skewness and K sample Kurtosis.

In other words, it is perfectly symmetrical around the mean with the value of excess kurtosis of three (3). Skewness is a measure of symmetry in a distribution whereas

kurtosis tells you how much data is in the tails and gives an idea about how peaked the distribution is. If the data comes from a normal distribution, the Jarque-Bera statistic asymptotically has a chi-squared distribution with two degrees of freedom, so the statistic can be used to test the hypothesis that the data are from a normal distribution.

3.5.2 Serial Autocorrelation

According to Gujarati (2004), serial correlation (autocorrelation) affects time series data and occurs when covariance between error terms is zero, $(\text{cov}(\epsilon_i, \epsilon_j) = 0, \text{ for } i \neq j)$ or follows an autocorrelated pattern. Autocorrelation refers to the correlation of a time series with its past and future values. The study used Breusch-Godfrey Lagrange Multiplier (LM) test, with the null hypothesis (H_0): no serial correlation, reject the null hypothesis if the p-value is less than 5 percent level of significance but the null hypothesis accepted if the p-value is greater than 5 percent level of significance.

In a regression model, a variable is endogenous when there is a correlation between the independent variable and the error terms. Endogeneity arises due to measurement errors, auto-regression with auto-correlated errors, simultaneity and omission of variables. To check for autocorrelation the study used a Durbin-Watson test, which uses studentized residual. Further, to complement the Durbin-Watson test, the study used the Breusch-Godfrey (1978) Lagrange Multiplier (LM) analysis. The rule of thumb is that Durbin-Watson (d) statistic falling between zero (0) and four (4) is acceptable. The d values around two (2) indicate no serial correlation in the error terms, whereas d values less than 2 suggest positive serial correlation and values greater than 2 suggest imply a negative serial correlation. Therefore, d greater than 1.5 and less than 2.5 would be acceptable.

3.5.3 Heteroscedasticity Test

For a linear regression model to hold, it requires that the variance of the regression model should be constant. Heteroscedasticity is realized when the error terms do not have constant variance (Gujarati, 2004). This study used a modified Breusch –Pagan test to test for the presence of heteroscedasticity, Breusch and Pagan (1979). Generally, the null hypothesis is H_0 : the variance of the error term is constant (homoscedastic) against the alternative hypothesis H_1 : the variance of the error term is not constant (heteroscedasticity).

3.5.4 Multicollinearity Test

Multicollinearity problem occurs when independent variables relate with each other and easily predictable from each other. This may show higher error term for each coefficients causing the regression equation to be responsive to trivial changes in data (Woolridge, 2002). Variance inflation factor (VIF), a reciprocal of tolerance ($1/1-R^2$) was used to measure how much the variance of an estimated regression coefficient could increase if the explanatory variables are correlated. A VIF value of less than 10 is acceptable (Hair, Anderson, Tatham & Black (1995). As a rule of thumb, if the VIF of a variable exceeds 10, which will happen if R^2 exceeds 0.90, that variable is said to be highly collinear (Gujarati, 2004).

3.6 Data Stationarity

In econometrics, unit root tests assess as to whether a time series variable is non-stationary or stationary using an autoregressive (AR) model. Non-stationary data, as a rule, is unpredictable hence cannot be modelled; the results obtained by non-stationary time series may be spurious (Gujarati, 2004). It is a standard practice to begin the analysis by examining the time series properties of the data to establish the stationarity

or non-stationarity of the data. Therefore, to obtain consistent and reliable results, the transformation of the non-stationarity data is necessary (Gujarati, 2004). The study used the Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) to test for stationarity of the time series data as discussed below.

3.6.1 Augmented-Dickey Fuller Test

To check for unit roots, this study used Augmented- Dickey Fuller (ADF) test. According to Mustafa and Rifaqat (2012), there are three different specifications in ADF namely; that which excludes the trend and the intercept, the one that excludes the trend but includes the intercept and lastly that includes both the trend and the intercept. This study adopted the last specification, which includes both intercept and trend. The null hypothesis was that the unit root exists against the alternative hypothesis of stationarity. The presentation of the model was as in equation 3.2

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^m \Delta Y_{t-1} + \epsilon_t \dots\dots\dots (3.2)$$

Where; Δ is first difference operator, Y is time series variable under study, α is a constant, t is time trend, $\beta_1 \dots \beta_2$ are the coefficients on the time trends, m is lag order of the autoregressive process and ϵ_t is a white noise error term.

The actual procedure is to compute the tau statistics, τ . If the absolute value of the computed tau statistic is greater than the ADF critical values, the hypothesis that there is a unit root is rejected, thus the time series is stationary (Gujarati, 2004) and vice versa. The decision criteria are that if the $t^* > \text{ADF critical value}$, then do not reject the null hypothesis, that is, unit root exists whereas if the $t^* < \text{ADF critical value}$, then reject the null hypothesis, meaning that unit root does not exist and the data is stationary (Nkoro & Uko, 2016).

3.6.2 Phillips and Perron Unit Root Test

According to Gujarati (2004), in the Dickey Fuller (DF) test, the key assumption is that the error terms μ_t are uniformly and freely distributed. To take care of the possibility of autocorrelation in the error term, the ADF test adjusts the DF test by adding the lagged difference terms of the explained variables. Phillips and Perron's test makes use of the distribution-free statistic to take care of autocorrelation in the error terms without adding the lagged difference terms. The presentation was as;

$$Z_{\tau\mu} = \tau_\mu(S_u/S_T) - 0.5(S^2_{T1} - S^2_u) \times T \{ S^2_{T1} \sum_{t=2}^T (Y_{t-1} - \bar{Y}_{-t})^{-1/2} \dots\dots\dots (3.3)$$

Where; $S^2_{T1} = T^{-1} \sum_{t=1}^T \mu^2_t + 2T^{-1} \sum_{j=1}^t \omega_{jt} \sum_{t=j+1}^T \mu_t \mu_{t-j}$, S^2_u is the sample variance of the residuals μ_t and the weights $\omega_{jt} = \{1-j/(t+1)\}$ ensure that the estimate of the variance is positive.

3.7 Lag Length Selection Criteria

Lag length selection involved the determination of the optimum number of lags that is necessary and appropriate before estimating an econometric ARDL model. This is because using more lags consumes degrees of freedom while using too few lags introduces correlation and multicollinearity (Gujarati, 2004). It was important to select an appropriate lag length; too few lags may result in rejecting the null hypothesis when it is true, while too many lags may reduce the power of the test (Harris & Sollis, 2003).

According to Gujarati (2004), conducting the lag length selection is to get the maximum number of lags for each variable. There are several criteria for selecting the lag lengths for the model. In this study, the selection criteria used were; Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC), Hannan Quinn Information Criterion (HQIC) and Final Prediction Error (FPE). According to Nkoro and Uko (2016), AIC or BIC with the smallest estimates is preferable for choosing the model's

lags. Hence, they aim at minimizing the residual sum of squares and minimizing the loss of degrees of freedom of the data (Gujarati, 2004).

3.8 Model Specification

The empirical analysis of this study was based on the Autoregressive Distributed Lag (ARDL) technique, which was developed by Pesaran *et al.*, (2001). This model was appropriate for the choice of the study because of the following advantages; first, according to Pesaran and Shin (1996), this model is applicable irrespective of whether the regressors are of the order 1(0) or 1(1) and are mutually cointegrated. Secondly, the model is more efficient to capture the long-run relationship of data in small samples (Pesaran & Shin, 1996) and lastly, there is no need to carry out a preliminary test of integration of the model's variables.

Sala-I-Martin (1997) claimed that economic theories are not enough to unravel exact factors determining growth, hence methodologies used by empirical growth researchers involves trying the variables that seem to be potential determinants of growth. The author further suggested a cross-sectional regression model in the form;

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + \epsilon \dots \dots \dots (3.4)$$

Where; Y represents a vector of economic growth rates, X_1, \dots, X_n represent Vectors of explanatory variables which can vary from one researcher to another, β_1, \dots, β_n represent the coefficients of the chosen variables of the study, α is a constant and ϵ is the error term. However, Solow Growth Model forms the basis for this study, which is in the form;

$$Y = f(A, K, L) \dots \dots \dots (3.5)$$

Where; Y is output, f is a function, A is technology, K is physical capital, L is labour.

Adopting the above model, the current study presented it in a general form as;

$$GDP_t = f(EXD, DS, GE) \dots \dots \dots (3.6)$$

Where; GDP_t : the proxy of economic growth at time t , EXD ; external debt stock as a ratio of GNI, DS ; external debt servicing as a ratio of GNI, GE ; government expenditure as a ratio of GDP and t ; is time, f ; is a function vector. This can be presented in a specific form as below;

$$Y_t = \alpha_0 + \alpha_1 EXD_t + \alpha_2 DS_t + \alpha_3 GE_t + \varepsilon_t \dots \dots \dots (3.7)$$

Where: Y_0 represents GDP a proxy for economic growth, EXD , DS , and GE remain as in eq. 3.5. ε is the error, α_0 is a constant, $\alpha_1 \dots \dots \alpha_3$ are the coefficients and t represents time.

To counter the problems associated with the other forms of cointegration, this study adopted autoregressive distributed lag (ARDL) approach, developed by (Pesaran *et al.*, 2001) which does not involve pre-testing variables, thereby obviating uncertainty. In other words, the ARDL approach to testing for the existence of a relationship between variables in levels is applicable irrespective of whether the underlying regressors are purely $I(0)$, purely $I(1)$ or mutually cointegrated. The statistic underlying the procedure is the Wald or F-statistic in a generalized Dickey-Fuller type regression. The pre-testing is particularly problematic in the unit root cointegration literature, in instances where the power of the unit root test is commonly very low and there is a shift in the distribution function of the test statistic as additional roots of X , the process tends towards unity, pre-testing is problematic (Pesaran and Shin, 1996). Pesaran (2001) tested the significance of the lagged levels of the variables under consideration in a conditional unrestricted equilibrium correction model.

Some of the merits of ARDL are; first, this method of cointegration analysis is not biased and is efficient as it performs well in small samples, also both the short-run and the long-run components of the model can be estimated simultaneously hence the

omitted and autocorrelation problems are solved. Besides, this method can differentiate between the regressors and the regressands. Moreover, the ARDL procedure employs only a single reduced form equation (Pesaran *et al.*, 2001). Compared to the other cointegration procedures that are Engle-Granger two-step (Engle & Granger, 1987), Johansen Maximum Likelihood (Johansen & Juselius, 1990) Phillips and Hansen (Phillips & Hansen, 1990) amongst other prominent cointegration tests are solely suitable for strictly I(1) stationary variables and estimate the long-run relationships within a context of a system of equations. On the contrary, the ARDL model is not applicable where there is more than one level relationship, (Pesaran *et al.*, 2001). Therefore, to achieve the targeted objectives of the study, the model of economic growth equation was estimated using the ARDL model of economic technique, which was specified as follows;

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^p \alpha_1 \Delta GDP_{t-i} + \sum_{i=1}^p \alpha_2 \Delta EXD_{t-i} + \sum_{i=1}^p \alpha_3 \Delta DS_{t-i} + \sum_{i=1}^p \alpha_4 \Delta GE_{t-i} + \delta_1 GDP_{t-1} + \delta_2 EXD_{t-1} + \delta_3 DS_{t-1} + \delta_4 GE_{t-1} + \varepsilon_t \dots \dots \dots (3.7)$$

Where; *GDP* is proxy for economic growth, *EXD* is external debt stock, *DS* is external debt servicing, *GE* is government expenditure, ε is error term and *t* is time (year). Δ represents the first difference of a variable, α_0 is a constant, $\alpha_1 \dots \alpha_4$ represent the short-run coefficients (error correction dynamic), $\delta_1 \dots \dots \dots \delta_4$ corresponds to the long-run relationship and ρ is a maximum lag order.

There are two stages for implementing the ARDL approach to find out the presence of long-run relationships between the studies variables. To analyze the significance of the lagged variables, the F-test statistic was computed. Two sets of appropriate critical values for different numbers of variables are provided by (Pesaran & Shin, 1996) and

(Nayaran, 2005). This model has an intercept, trend or both intercept and trend. One set assumes that all the ARDL model variables are of order I(0) while the other assumes that all the variables are of order I(1). If for a given significant level, the F-statistic is above the upper-bound critical value, then it is concluded that there is a non-spurious long-run level relationship with the dependent variable but if it lies below the lower-bound critical value, then it is concluded that there is no long-run level relationship with the dependent variable. The result is inconclusive if it lies between the upper and the lower limit (Nayaran, 2005).

Generally, the null and the alternative forms of the F- test statistic was as follows; $H_0: \delta_1 = \delta_2 = \delta_3 = \delta_4 = 0$, meaning that there is no long-run relationship between the variables, while $H_1: \delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq 0$, means there is a long-run relationship between the variables. Secondly, if the cointegration between variables is identified, a further analysis of long-run and short-run (error correction) relationship between the variables have to be undertaken. The error correction representation of the series was specified as follows:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^p \alpha_1 \Delta GDP_t + \sum_{i=1}^p \alpha_2 \Delta EXD_{t-1} + \sum_{i=1}^p \alpha_3 \Delta DS_{t-1} + \sum_{i=1}^p \alpha_4 \Delta GE_{t-1} + \delta_1 GDP_{t-1} + \delta_2 EXD_{t-1} + \delta_3 DS_{t-1} + \delta_4 GE_{t-1} + \varepsilon_t + \xi ECM_{t-1} \dots \dots \dots (3.8)$$

Where ECM_{t-1} is the error correction term, which is used to capture the long-run relationship and it reflects the attempts for the correction of the deviations from the long-run path. Its coefficient is interpreted as the speed of adjustment or the amount of disequilibrium transmitted each period to economic growth. The rest of the variables remain as explained earlier in equation (3.6).

3.8.1 Model Suitability Assessment

In research data analysis, the inferential statistics quality control is vital for the interpretation of output to be viable as well as to increase data validity. The cumulative sum (CUSUM) of the recursive residuals, which is a sequential analysis method pioneered by Page in 1954 was used in the model stability analysis. The technique monitors change detection to facilitate a corrective measure. The concept entails computing for a statistic called CUSUM for each time under the null hypothesis that the statistic is from a distribution called the CUSUM distribution. If for instance, the calculated CUSUM statistics appear to be too large to have been drawn from the CUSUM distribution, the examiner rejects the null hypothesis of model stability (Brown, Durbin & Evans, 1975).

3.9 Granger Causality Test

Causation in any meaningful world does not imply a correlation, but According to Granger (1969), the question of whether X causes Y is to find out how much of the past values of Y can explain the current Y and to find out whether the explanation can be improved by adding past values of X. In this study, it was predicted that external debt stock, debt service and government expenditure predicted economic growth. Similarly, economic growth as well as influenced external debt stock, external debt service and government expenditure. If this was the case then the model suffered from simultaneous bias. This study conducted the causality test to find out the direction of causation. The procedure the study followed was to test for Granger causality of economic growth, external debt stock, external debt service and government expenditure variables. this was done by running a linear equation with GDP as the dependent variable and external debt stock, external debt service as the independent variables, and then the F-test was done for the joint significance of the variables.

3.10 Description and Measurement of Study Variables

Variables description is a process of allocating symbols to variables to allow measurability (Sekaran, 2010). In this study, the dependent variable was the economic growth, proxied by the change in GDP. The independent variables were external debt service and government expenditure. The first two were proxied as a percentage of GNI while the latter by GDP. The summary was presented as shown in table 3.1.

Table 3.1: Description and Measurement of Study Variables

Variable	Description of Variables	Measurement	Expected Output
Economic growth (GPD)	The additional productive potential of an economy, which results in the economy's capability of producing more amounts of goods and services over a given period of one year.	Annual percentage change in country's GDP with inflation adjustment $\frac{GDP_t - GDP_{t-1}}{GDP_{t-1}}$ (Muhanji & Ojah, 2011)	Dependent variable
External debt stock (EXD)	It is the proportion of the debt stock borrowed from foreign lenders and represents the outstanding amount of actual or current liabilities that require a certain payment of principal plus interest attached to it in future.	Annual external debt stock (EXD) as a percentage of annual Gross Net Income (GNI) $\frac{EXD}{GNI} \%$ (Hassan & Akhter (2012)	Negative
External debt service (DS)	It is the total amount of currency needed at a particular period to repay both the principal amount of external debt plus the interest thereon.	Annual external debt service cost as a percentage of annual gross net income (GNI) $\frac{DS}{GNI} \%$ (Hassan & Akhter, 2012)	Negative
Government expenditure (GE)	This refers to the sum of private consumption, government consumption, and gross capital formation, which is a form of investment.	Annual government spending as a percentage of GDP $\frac{GE}{GDP} \%$ (Salih, 2012)	Positive

Sources: Research Data 2020

CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Overview

This section presents the results of diagnostic tests, descriptive statistics, correlation analysis, time series plots, data stationarity checks, lag selection criteria, and ARDL model estimation.

4.1 Diagnostic Tests Results

In this study, the following diagnostic tests were carried out; test for normality using Jarque-Bera (JB) test, serial correlation presence using Breusch-Godfrey Lagrange Multiplier (LM) test and heteroscedasticity using Breusch-Pagan-Godfrey test.

4.1.1 Normality Test Results

The study tested whether the data used in this research followed a normal distribution. In statistics, a normal distribution has a skew of zero. The Jarque-Bera results were as presented in figure 4.1.

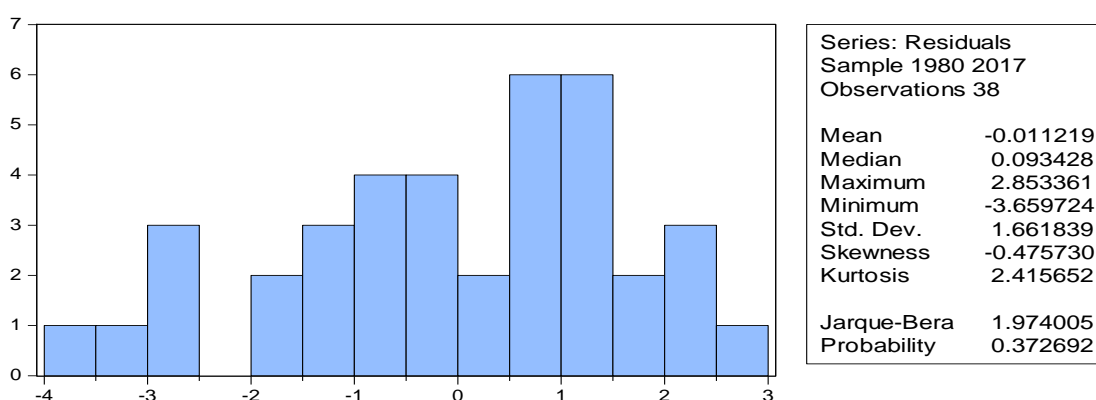


Figure 4.1: Normal distribution Tests Results

Source: Research data 2020

From table 4.1, the null hypothesis for testing normality was that data were normally distributed; $H_0: JB (p > 0.05)$ against the alternative hypothesis that the data is not normally distributed $H_1: JB (p < 0.05)$. Figure 4.1 showed that the data used in this

study followed a normal distribution since its mean was around zero and the skewness of -0.47573. The kurtosis was 2.415652, which was approximately three, and that JB statistic was 1.974 and its probability was 0.372692. Based on the Jarque-Bera test results significance, the null hypothesis that the data was normally distributed was accepted. The acceptance of the null hypothesis meant that the data followed a normal distribution.

4.1.2 Serial Correlation Test Results

Autocorrelation refers to a situation whereby two or more consecutive errors are related. It is a common problem in the time series data. Breusch-Godfrey Serial Correlation Lagrange Multiplier Test was used to test for autocorrelation. These results are as presented in table 4.1.

Table 4.1: Breusch-Godfrey Serial Correlation LM Test

F-statistic	2.048211	Prob. F(4,29)	0.1137
Obs*R-squared	8.370643	Prob. Chi-Square(4)	0.0789
Variable	Coefficient	Std. Error	t-Statistic
C	3.961400	42.30983	0.093628
External Debt Stock	0.581470	1.756292	0.331078
Debt Service	-0.767757	2.569042	-0.298850
Government Expenditure	-1.043804	8.317778	-0.125491
RESID(-1)	0.474786	0.183183	2.591866
RESID(-2)	-0.125423	0.214672	-0.584253
RESID(-3)	0.016780	0.208571	0.080453
RESID(-4)	-0.170512	0.191587	-0.890000
R-squared	0.220280	Mean dependent var	-1.30E-15
Adjusted R-squared	0.005185	S.D. dependent var	1.967643
S.E. of regression	1.962535	Akaike info criterion	4.389745
Sum squared resid	111.6948	Schwarz criterion	4.777595
Log-likelihood	-74.40516	Hannan-Quinn criterion	4.527739
F-statistic	1.024105	Durbin-Watson stat	1.923498
Prob (F-statistic)	0.113741		

Source: Research Data 2020

From table 4.1 it was evident that the observed R squared probability value is 0.079, which was greater than 5 percent level of significance ($p > .05$) and therefore led to the acceptance of the null hypothesis of no serial correlation. This implied that there was

no serial correlation between the explanatory variables. According to Durbin and Watson (1950), the value of Durbin-Watson Statistic that is between 0-2 indicates there is a positive serial correlation, while values between 2 and 4 indicate a negative serial correlation. The acceptable threshold values between 1.5 and 2.5, which imply no serial correlation. From figure 4.1, the Durbin-Watson statistic of 1.923 lied within the acceptable range of between 1.5 and 2.5, and as such, the study concluded that there was no serial correlation among the study variables. Thus, the research data was fit for prediction.

4.1.3 Heteroscedasticity Test Results

The study assessed heteroscedasticity using Breusch-Pagan-Godfrey. The null hypothesis is that the error terms are homoscedastic against the alternative of heteroscedasticity. It tested whether the variance of the errors from regression was dependent on the values of the independent variables. The Breusch-Pagan-Godfrey results were as presented in table 4.2.

Table 4.2 Heteroscedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.204346	Prob. F(4,33)	0.9342
Obs*R-squared	0.918479	Prob. Chi-Square(4)	0.9219
Scaled explained SS	0.529000	Prob. Chi-Square(4)	0.9706
Variable	Coefficient	Std. Error	t-Statistic Prob.
External Debt Stock	-1.508422	4.304821	-0.350403 0.7283
Debt Service	2.269319	6.216224	0.365064 0.7174
Government Expenditure	-1.085687	20.23945	-0.053642 0.9575
R-squared	0.024171	Mean dependent var	3.769735
Adjusted R-squared	-0.094112	S.D. dependent var	4.721494
S.E. of regression	4.938673	Akaike info criterion	6.154150
Sum squared resid	804.8863	Schwarz criterion	6.369622
Log likelihood	-111.9288	Hannan-Quinn criter.	6.230813
F-statistic	0.204346	Durbin-Watson stat	2.220678
Prob(F-statistic)	0.934178		

Source: Research Data 2020

From the result presented in table 4.7, the probability of F-statistic = 0.9342, that p-value for the observed R squared is 0.9219. These p-values are greater than 0.05 level of significance. This implies that the null hypothesis was accepted and concluded that the variance was homogeneous (homoscedasticity).

4.1.4 Multicollinearity Test Results

To assess multicollinearity between independent variables, the variance inflation factor (VIF) values were generated. There are two kinds of VIF; centred VIF from the original equation with the regressor and a constant; and uncentered VIF from the original equation with only one regressor and no constant. Both showed how a variation of a coefficient estimate of the regressor inflates due to collinearity with other regressors. The results were shown in Table 4.3

Table 4.3: Variance Inflation Factors

Sample: 1980 2017: Included observations: 37			
Variable	Coefficient Variance	Uncentered VIF	Centred VIF
Gross Domestic Product(-1)	0.027259	4.816973	1.263863
External Debt Stock	0.001131	34.72178	6.821138
Debt Service	0.072002	28.06521	8.727668
Government expenditure	0.016019	1644.918	4.158165
Constant	209.9567	1849.511	NA

Source: Research Data 2020

Table 4.3 indicated that all the explanatory variables had no multicollinearity problems because the centred VIF coefficients were greater than one (1), the accepted threshold of 10 percent (.10) and less than ten (10). For instance, EXD (VIF = 6.8211), DS (VIF = 8.7276) and GE (VIF = 4.158165) indicated variance coefficient inflation less than 10, which was within the accepted threshold (Gujarati, 2004; Hair *et al.*, 1995). Thus, based on these results, there was no proof of multicollinearity.

4.1.5 Model Stability Assessment Results

The study used a visual examination of recursive parameter estimates to evaluate the stability of the data model using CUSUM. The CUSUM test results were as shown in figure 4.2.

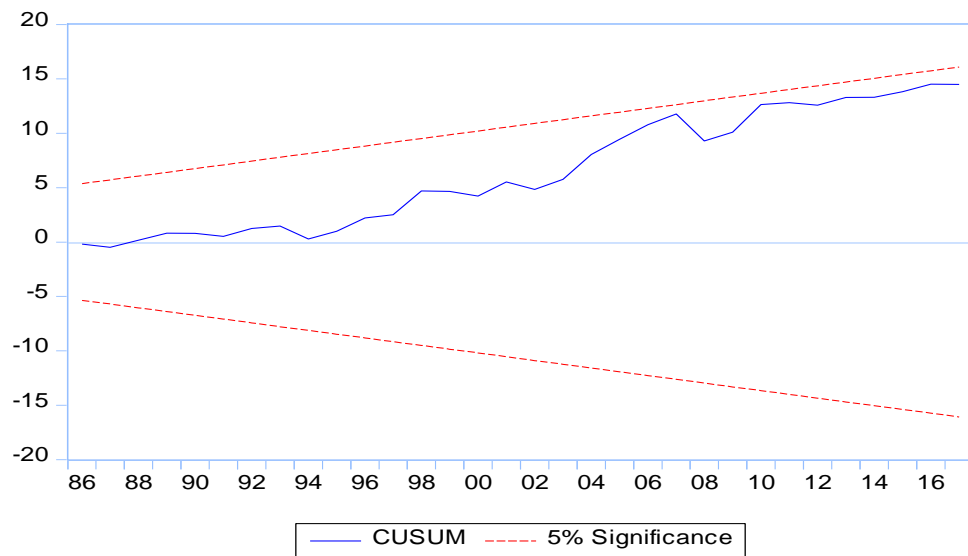


Figure 4.2 Model Stability Test —CUSUM Test:

Source: Research Data 2020

Figure 4.2 showed that the cumulative sum of squares was generally within the CUSUM of 5 percent significance of the red dotted lines, which suggested that the residual variances were not out-of-control and thus the data was stable. Based on the results the study failed to reject the null hypothesis of model stability, which implied that the variables' data was all-stable and were suitable for successful prediction.

4.1.6 Univariate Time Series Plots Results

In econometric models, it is prudent to have plots of each time series data sets to have a visual inspection. The graphical representation for the gross domestic product was as shown in figure 4.3.

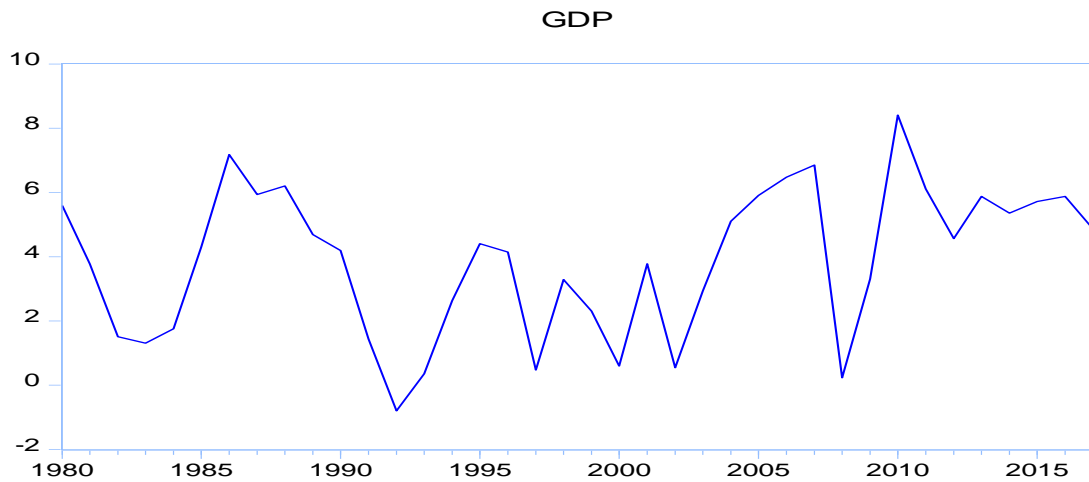


Figure 4.3: Time Series Plot for Gross Domestic Product

Source: Research Data 2020.

Figure 4.3 demonstrated that in the late 1980s and early 1990s, gross domestic product growth was trending downwards, in fact, below zero (negative).

The study generated a graphical representation of external debt stock as was shown in Figure 4.4.

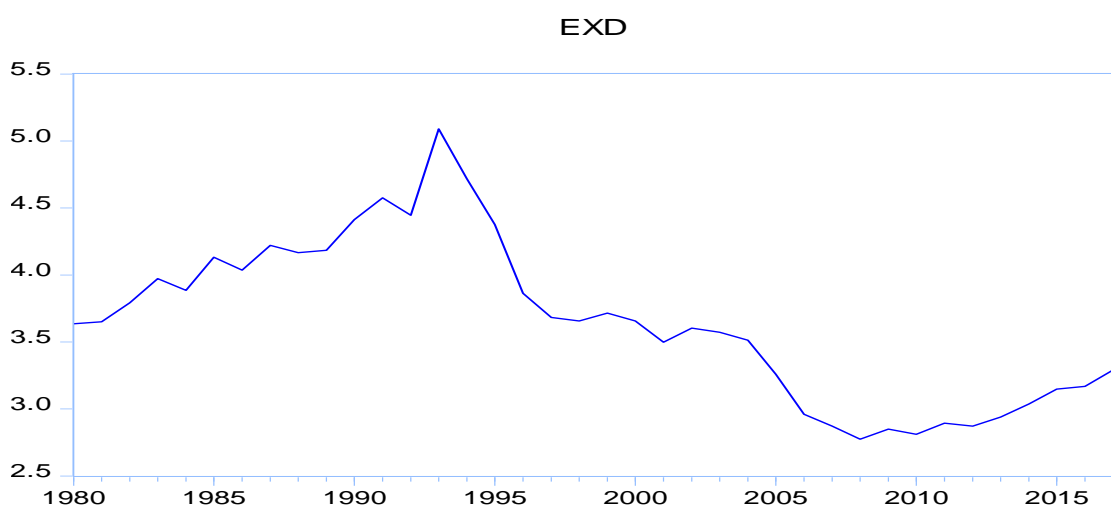


Figure 4.4: Time Series Plot for External Debt Stock

Source: Research Data 2020

Figure 4.4 demonstrated a trend of the study variables during the study period. External debt stock data was trending upwards in the 1980s and then started trending downwards

again in early 1990s, then started going up from 2010. This showed that the data was trending with drift.

The study generated a graphical representation of external debt services as was shown in Figure 4.5.

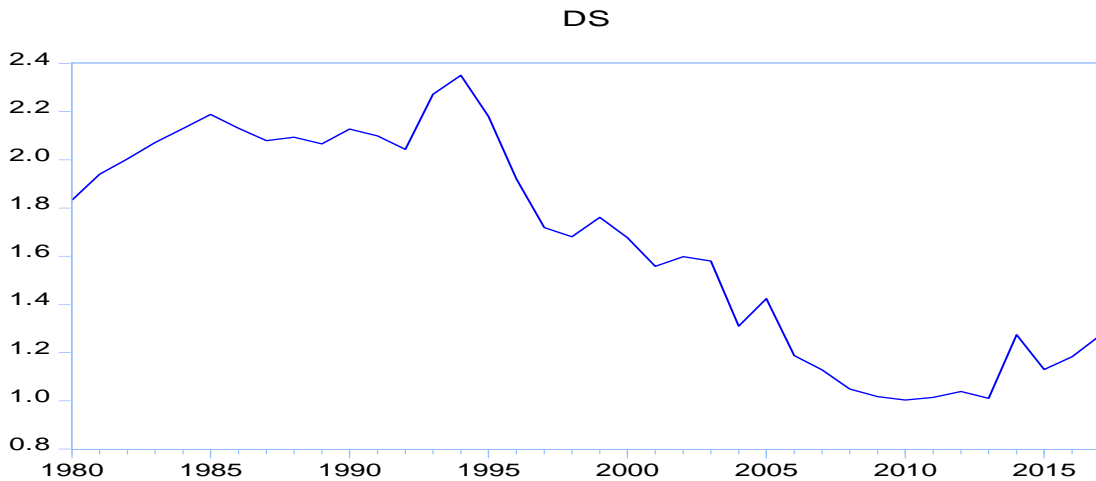


Figure 4.5: Time Series Plot for External Debt Services

Source: Research Data 2020

Figure 4.5 demonstrated a trend of the study variables during the study period. This figure demonstrated that debt service was trending upwards in the 1990s then started trending downwards again from the mid-1990s. External debt service exhibited a trend with drift.

The study generated a graphical representation of Government Expenditure as was shown in Figure 4.6

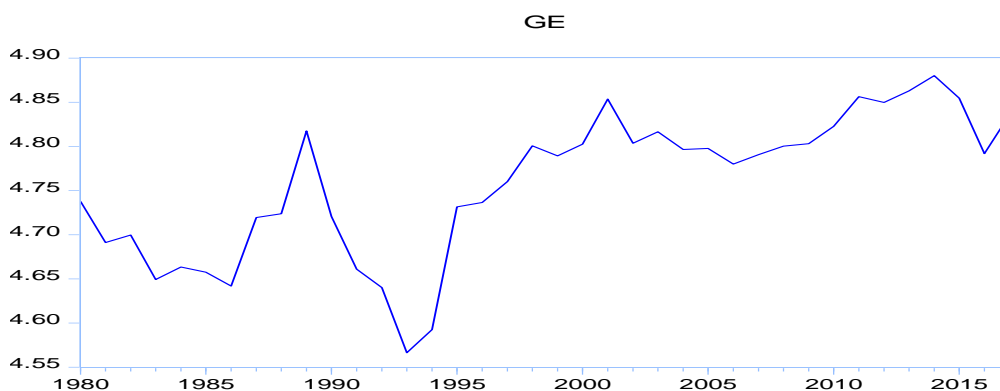


Figure 4.6: Time Series Plots for Government Expenditure

Source: Research Data 2020

From figure 4.6, it was evident that government expenditure exhibited no trend in that at some point, the data was trending upwards while very low at some points. The data was trending very low in the years between 1990 and 1995, and then started trending upwards but with fluctuations.

Further analysis revealed that in figures 4.3-4.6, the curves indicated the nature of the data generating process (DGP). The figures demonstrated a trend of the study variables over the study period. All data in DGP exhibit three types of graphs, which according to the stochastic process all happens by chance. That is, a time-series data set normally exhibits drift, trend or trending with drift, while an exponential trend exhibits constant proportional growth (Hamilton, 1994).

4.2 Data Stationarity Test Results

To assess the stability of the time series data sets, unit-roots presence tests were employed. Presence of unit root implies that the mean and variance are not constant rather changes over time and therefore estimation using non-stationary data (with unit root) leads to meaningless regression estimates (Gujarati, 2004). The study applied two unit root tests; Augmented-Dickey-Fuller (ADF) and Philip-Perron (PP) unit root tests and their results were as presented in table 4.4 and 4.5 respectively.

4.2.1 Augmented-Dickey-Fuller Unit Root Test Results

Table 4.4: Augmented Dickey-Fuller Unit Root Tests (5% level of significance)

Variable	ADF	t-statistic	Lag	P value	Remarks
Gross Domestic Product	3.82	3.54	0.57	0.0263	ADF>t, p<0.05; stationary 1(0)
External Debt Stock	2.2	3.54	0.20	0.4751	ADF<t, p>0.05; nonstationary
Debt Service	2.83	3.54	0.27	0.1937	ADF<t, p>0.05; nonstationary
Government Expenditure	3.90	3.54	0.764	0.0230	ADF>t, p<0.05; stationary 1(0)
Test at First Difference					
Variable	ADF	t-statistic	Lag	P value	Remarks
External Debt Stock	6.039	3.54	1.05	0.0001	ADF>t, p<0.05; stationary 1(1)
Debt Service	4.516	3.54	0.94	0.003	ADF>t, p<0.05; stationary 1(1)

* MacKinnon (1996) one-sided p-values. The null hypothesis (H_0): Data has a unit root. The alternative hypothesis (H_a): Data has no unit root.

Source: Research Data 2020

Table 4.4 shows that GDP and GE data were stable or stationary at levels $I(0)$, which implies that data has no unit root or they are stationary, hence the null hypothesis was rejected and the alternative accepted. However the external debt stock (EXD) and the debts service (DS) had a unit root at levels, but they became stationary after first differencing. This implies that they were integrated of order one $I(1)$.

4.2.1 Phillips-Perron Unit Root Tests Results

The Philips-Perron unit root test was used to improve on the finite sample properties and to accommodate more modelling framework (Greene, 2008).

Table 4.5: Phillips Perron Unit Root Tests Test (5% level of significance)

Variable	PP	t-stat	Lag coef	P value	Remarks
Gross Domestic Product	3.89	3.54	0.56	0.0224	PP>t, p<0.05; stationary $I(0)$
External Debt Stock	2.22	3.54	0.21	0.4733	PP<t, p>0.05; nonstationary
Debt Service	2.68	3.54	0.23	0.2499	PP<t, p>0.05; nonstationary
Government Expenditure	3.18	3.54	0.406	0.1023	PP<t, p>0.05; nonstationary
Test at First Difference					
External Debt Stock	6.039	3.54	1.054	0.0001	PP>t, p<0.05; stationary $I(1)$
Debt Service	4.154	3.54	0.727	0.0122	PP>t, p<0.05; stationary $I(1)$
Government expenditure	6.1	3.54	1.06	0.0001	PP>t, p<0.05; stationary $I(1)$

* MacKinnon (1996) one-sided p-values

Source: Research Data 2020

The power of the ADF test is very low. The ADF test is unable to distinguish clearly between non-stationary and stationary series with a higher degree of autocorrelation and is quite sensitive to breaks. Therefore, the Phillips-Perron test was used to overcome this limitation. The results presented in Table 4.5 indicated that the gross domestic product growth data were stationary at levels implying that the null hypothesis was rejected and the alternative accepted for the two variables. However, external debt stock and debt service data were not stationary at levels, but they become stationary after first difference. Based on these results, the study sufficiently proved that the data set met the basic criteria that allowed for the adoption ARDL model.

4.3 Optimum Lag Length Selection Results

Different lags can critically influence the substantive interpretation of the estimates, especially when the differences are large enough. An asterisk (*) indicates the minimum and appropriately selected lag from each column criterion as shown in table 4.6.

Table 4.6: VAR Lag Order Selection Criteria

Endogenous variables: Gross Domestic Product, External debt Stock, Debt Service, Government Expenditure; Sample: 1980 2017 : Observations: 34

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-41.53837	NA	1.06e-05	2.737551	2.962016	2.814100
1	27.60398	113.8815*	8.07e-07*	0.140942	1.487731*	0,600236*
2	45.17289	23.76970	1.38e-06	0.578065	3.047178	1.420103
3	73.07237	29.54063	1.55e-06	0.407507	3.998944	1.632290
4	118.2137	34.51983	8.91e-07	-0.777276*	3.936484	0.830251

* indicates lag order selected by the criterion; LR: sequentially modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

Source: Research Data 2020

From the results in table 4.6, LR, FPE, SC and HQ indicated that ARDL should be estimated at lag one (lag = 1) but AIC indicates that it should be estimated at lag four (lag = 4) as indicated by (*). According to Gujarati (2004), the criterion that has the smallest value would be chosen for model estimation to have more degrees of freedom. Therefore based on the AIC criterion this study estimated the model at lag 4.

4.4 Paired Causality Statistics

The study conducted the causality test to know the direction of causation. The procedure the study followed was to test for Granger causality of economic growth, external debt stock, external debt service and government expenditure variables. The Granger Causality test as was shown in table 4.7.

Table 4.7 Pairwise Granger Causality Tests

Sample: 1980 2017; Lags: 4				
Null Hypothesis:	Obs	F-Statistic	Prob.	Decision Verdict
EXD does not Granger Cause GDP	34	2.05459	0.1172	Fail to reject; No causality
GDP does not Granger Cause EXD		1.63080	0.1977	Fail to reject; No causality
DS does not Granger Cause GDP	34	1.66585	0.1893	Fail to reject; No causality
GDP does not Granger Cause DS		2.93930	0.0404	Rejected; Unidirectional
GE does not Granger Cause GDP	34	0.48309	0.7479	Fail to reject; No causality
GDP does not Granger Cause GE		0.77518	0.5517	Fail to reject; No causality
DS does not Granger Cause EXD	34	3.83359	0.0146	Rejected; Bidirectional
EXD does not Granger Cause DS		4.37147	0.0081	Rejected; Bidirectional
GE does not Granger Cause EXD	34	0.06007	0.9929	Fail to reject; No causality
EXD does not Granger Cause GE		2.38614	0.03782	Rejected; Unidirectional
GE does not Granger Cause DS	34	2.10268	0.1105	Fail to reject; No causality
DS does not Granger Cause GE		3.56868	0.0196	Rejected; Unidirectional

Source: Research Data 2020

Table 4.7 presented the pairwise Granger Causality Test and indicated that external debt stock and external debt services cause each other, that is, there was bidirectional causality between EXD and DS no causality between GDP and external debt stock. Both DS and EXD cause government expenditure (GE).

This observation was supported by Chowdhury (2001) study on the dual association of foreign debt and economic advancement, which concluded that there was a bidirectional relationship between external debt stock and growth in GDP. Similarly, Egbetunde (2012) and Rahman, Basher & Dey (2012) found that there existed a bidirectional relationship between external debt and economic growth. Shah and Pervin (2012) examined the short-run effect of external debt stock on economic growth in Bangladesh, the results indicated that in the short-run, external debt affected GDP positively, and nonetheless, crowding out effect was experienced due to the negative effect of debt service to creditors due to debt stock accumulation, which caused the service payment to increase. These findings conflicted with a study done by Gani (1999) which investigated the burden of external debt in the South Pacific Island

Countries and concluded that excessive borrowing was associated with serious difficulties hence it was a hindrance to economic growth.

4.5 Descriptive Statistics Results

To visualize the data collected and make a meaningful presentation, descriptive statistics were generated for each variable. These include maximum and minimum, mean, and standard deviation, skewness and kurtosis along with Jarque-Bera to guide on normality. According to Jarque and Bera, (1987), as a rule of thumb, the skewness should be between negative two (-2) and positive two (+2) and kurtosis should lie between negative three (-3) and positive three (+3) for any data to be normal. The descriptive results were as shown in table 4.8

Table 4.8: Descriptive Statistics Results

	Gross Domestic Product	External Debt Stock	External Debt Service	Government Expenditure
Mean	3.873442	52.79133	5.538236	107.7918
Maximum	8.405699	131.8996	12.98728	116.2188
Minimum	-0.799494	21.35702	1.007870	95.21637
Std. Dev.	2.300130	26.17725	3.710897	5.433823
Skewness	-0.263970	0.940598	0.222972	-0.523625
Kurtosis	2.115011	3.616870	1.658324	2.334192
Jarque-Bera	1.681383	6.205756	3.165022	2.438389
Probability	0.431412	0.044920	0.205459	0.295468
Sum	147.1908	2006.070	210.4530	4096.087
Sum Sq. Dev.	195.7522	25354.20	509.5180	1092.478
Observations	38	38	38	38

Sources: Research Data 2020

The results presented in Table 4.8 were the summary of descriptive statistics for the study variables. The statistics showed that growth in Gross Domestic Product, external debt stock debt service and government expenditure had means of 3.9 ± 2 , 52.8 ± 26 , 5.5 ± 3.7 and 107.8 ± 5.4 respectively. Furthermore, growth in gross domestic product and government expenditure data set were negatively skewed, an indication that the majority of observed variables data were to the left of the mean than expected in a

normal distribution. External debt stock, debt service and government expenditure were positively skewed, showing that most of the data set fell to the right of the mean. Importantly, all the skewness coefficients were within the accepted range of positive two (+2) and negative two (-2). Besides, kurtosis statistics revealed that external debt stock data exhibited a kurtosis marginally greater than three and all study variables had positive kurtosis coefficients, an indication of relatively peaked distributions than their expected normal distributions. Table 4.8 results provided an insightful information regarding the time series data for the study period. The results revealed that on average approximately 54 percent $(52.8 + 5.5) / 107.8$ of total government expenditure (GE =107.8) was being used for payment of the external debt stock principal amount (52.8) and external debt servicing or interest payment thereon (5.5). This showed that the remaining less than a half 46 percent $(1-0.54)$ of the total expenditure was available for productive economic development.

4.6 Correlation Analysis Results

To understand the relationship between variables, the study employed correlation analysis. This provided the direction and the strength of the linkages between two variables in a single value ranging from correlation coefficient (r) of negative one (-1) to a positive one (1). The correlation results matrix was as provided in Table 4.9.

Table 4.9: Correlations Analysis Matrix Results

Variables	GDP	EXD	DS	GE
Gross Domestic Product (GDP)	1			
External Debt Stock (EXD)	-0.406678*	1		
External Debt Service (DS)	-0.337188*	0.917576**	1	
Government Expenditure (GE)	0.382661*	-0.815975**	-0.865521**	1

*. Correlation is significant at the 0.05 level (2-tailed).

Source: Research Data 2020

Table 4.9 showed that Gross Domestic Product growth rate related negatively with both external debt stock ($r = -0.407$, $p < .05$) and debt service ($r = -.337$, $p < .05$) with significance, while it related positively with government expenditure ($r = 0.38$, $p < .05$). Importantly, all the variables correlation coefficients were statistically significant ($p < .05$). The negative results implied that as the government borrows more and more, external debt stock along with repayment of the interest suppresses the growth in gross domestic product. In other words, as debt increases, the GDP growth decreases. Further, the positive relationship showed that as government expenditure increased, gross domestic product growth increased also, that is, they moved in the same directions. The univariate time series plots further gave a demonstration of the same.

4.7 Hypotheses Tests Results

The main objective of the study was to establish the effect of external debt on economic growth in Kenya. This was addressed through testing the following four null hypotheses: first, the null hypothesis (H_{01}) stated that external debt stock has no significant effect on economic growth in Kenya. The second null hypothesis (H_{02}) stated that debt service has no significant effect on economic growth in Kenya. The third null hypothesis (H_{03}) stated that government expenditure has no significant effect on economic growth in Kenya. Finally, the fourth null hypothesis (H_{04}) stated that external debt stock, external service and government expenditure jointly have no significant long-run relationship with economic growth in Kenya. The Autoregressive distributed lag (ARDL) approach was used to estimate the model as shown in table 4.10.

Table 4.10: Autoregressive Distributed lag Regression Results

Sample (adjusted): 1984 – 2017

Observations: 34 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	P-values
Gross Domestic Product L ₁	0.193204	0.184006	1.049991	0.3162
L₂	-0.308291	0.198540	-1.552791	0.1488
External Debt Stock L ₀	4.698747	3.003057	1.564655	0.1460
L ₁	-3.074624	3.357904	-0.915638	0.3795
L ₂	-0.264700	4.093437	-0.064664	0.9496
L ₃	13.22928	4.410061	2.999796	0.0121
L₄	-7.530565	2.758313	-2.730134	0.0196
External Debt Service L ₀	-11.34514	5.098758	-2.225079	0.0479
L ₁	3.923499	5.475587	0.716544	0.4886
L ₂	-3.071607	6.434928	-0.477334	0.6425
L₃	-13.57871	6.095768	-2.227563	0.0477
Government Expenditure L ₀	-0.893904	14.39051	-0.062118	0.9516
L ₁	-40.03599	13.84992	-2.890702	0.0147
L ₂	-1.042547	11.42783	-0.091229	0.9290
L ₃	-15.43782	11.75743	-1.313027	0.2159
L₄	26.96519	11.47284	2.350350	0.0385
Constant	446.1818	130.1460	3.428317	0.0056
R-squared	0.848788	Mean dependent var		3.970875
Adjusted R-squared	0.546363	S.D. dependent var		2.337361
S.E. of regression	1.574272	Akaike info criterion		3.969939
Sum squared resid	27.26166	Schwarz criterion		5.002477
Log likelihood	-44.48897	Hannan-Quinn criter.		4.322064
F-statistic	2.806612	Durbin-Watson stat		2.291043
Prob(F-statistic)	0.039836			

Sample (adjusted): 1984 – 2017: Observations: 34 after adjustments, Lag zero (L₀), lag one (L₁), lag two (L₂), lag three(L₃), lag four (L₄)**Sources: Research Data 2020**

Table 4.10 shows the overall model fit value for R-squared as 0.848788, which implied that the explanatory variables (debt stock, debt service & government expenditure) jointly explain 85 percent of the variation in gross domestic product growth. The results indicated that all explanatory variables could be used for estimation at no lag, lag 1, lag 2, lag 3 and lag 4. Since the results presented earlier in table 4.5 on the selection criterion, to maintain or have more degrees of freedom, the study estimated the ARDL (2, 4, 3, and 4) model to test for the null-hypotheses.

The first null hypothesis (H_{01}) stated that external debt stock has no significant effect on economic growth in Kenya. From table 4.8, the regression results showed that external debt stock had a negative beta coefficient value ($\beta = -7.530565$) and a p-value of 0.0196 ($p < .05$). Based on these results, the study rejects the first null hypothesis (H_{01}) and found that there was a statistically significant relationship between external debt stock and gross domestic product. This implied that with an increase in external debt stock the economic growth would be suppressed as indicated by the negative relationship. In other words, a unit changes in Kenya's external debt stock leads to a 7.35 units decrease in economic growth. This finding concurred with other studies (Elbadawi *et al.*, 1996; IMF, 2005; Were, 2001; Ogege & Ekpudu, 2010; Mustafa & Rifaqat, 2012; Babu *et al.*, 2014; and Mbah *et al.*, 2016) which reported negative significant relationships between external debt stock and economic growth. However, the findings contrast with other studies (Chowdhury, 2001; Frimpong & Oteng-Abayie, 2006; Shah & Pervin, 2012; and Sulaiman & Azeez, 2012) which found a significant positive relationship between external debt stock and economic growth. To explain the cause of the differences in the results of the current study and those results, which obtained positive relationships, is that different studies adopt different variables and also they are based on different contexts and theoretical underpinnings which may not have similar characteristics with the current study.

The second hypothesis (H_{02}) stated that external debt service has no significant effect on economic growth in Kenya. Table 4.8, results showed that debt service had a negative coefficient ($\beta = -13.57871$) and p-values of 0.0477 ($p < .05$). These results indicated that there was enough evidence to reject the second null hypothesis (H_{02}) and the study found that external debt service had a statistically significant influence on economic growth in Kenya. The relationship was negative and statistically significant

which implied that a unit increase in Kenya's external debt service would lead to a decrease in economic growth by 13.58 units *ceteris paribus*. This negative effect may be attributed to the fact that money borrowed would have to be paid which in essence reduces investment and other productive areas such as infrastructure and equally increases unemployment in the economy as earlier noted that payment of debts and servicing accounts for more than half of government expenditure. This finding concurred with other studies (Chowdhury, 2001; Frimpong & Oteng-Abayie 2006; Polly, 2009; Malik *et al.*, 2010 and Akram, 2011) which found a negative relationship. These results were in contrary to those studies by Swamy (2015), Zaman and Arslan (2014), Clements *et al.*, (2003), Nakitami, and Herera (2007) which found positive relationships between external debt service and economic growth. The differences in the results of the different authors were the possibility of debt relief in other countries, which led to a reduction in the debt burden in terms of debt servicing

The third hypothesis (H_{03}) stated that government expenditure has no significant effect on economic growth in Kenya. From table 4.8, the results showed that government expenditure had a positive coefficient of ($\beta = 26.96519$) and p-values of 0.0385 ($p < .05$). This showed that there was a statistically significant positive relationship between government expenditure and growth in gross domestic product. Based on these results, the study rejected the third null hypothesis (H_{03}) and found that government expenditure significantly affected economic growth in Kenya. This implied that there was a direct positive relationship between government expenditure and economic growth. That is a unit increase in government expenditure, led to a positive increase in economic growth by 26 units. This finding was in agreement with other studies, which contented with a positive relationship between government expenditure and economic growth (Devarajan & Vinay, 1993; Musgrave, 1999; Gregorious & Ghosh, 2007; Olorunfemi,

2008; and Wahab, 2011). Nevertheless, the finding was in contrast with results findings of other studies, which suggested a negative relationship between government expenditure and economic growth (Alexander, 1990; Mitchell, 2005; and Hasnul, 2015).

4.8 ARDL Long Run Form and Bounds Test Results

The fourth hypothesis (H_{04}) examined whether there was a significant long-run relationship between the external debt stock, external debt service, government expenditure and economic growth in Kenya. To investigate the relationship, an ARDL long run form and bounds tests were carried out. This entailed evaluation of the short-run and long-run equilibrium among variables. The thumb rule is that if for a given significant level, the F-statistic is above the upper-bound critical value, it is concluded that there is a non-spurious long-run level relationship with the dependent variable but the conclusion of no long-run level relationship is arrived at when the F-statistic lies below the lower-bound critical value. The result is inconclusive if it lies between the upper and the lower limit (Nayaran, 2005). The ARDL long-run form and bounds tests results are presented in Table 4.11. From table 4.11, the critical values at a 5 percent level of significance upper and lower bounds were 4.036 and 5.304, while the F statistic was 6.558462. Based on these results, the F-statistic was above the upper-bound critical value and the study concluded therefore that there was a non-spurious long-run level relationship among the independent and dependent variables. Therefore, the hypothesis test result provided enough evidence to reject the fourth null hypothesis (H_{04}). The rejection of the null hypotheses meant that there was a significant long-run relationship between the dependent and the independent variables in this study.

Table 4.11: ARDL Long Run Form and Bounds Test Results

Levels Equations				
Unrestricted Constants and Unrestricted Trends				
Variables	Coefficients	S.E	t	p-values
External Debt Stock	6.329681	6.1156	1.035	.3229
Debt Service	-21.58752	12.4381	-1.736	.1105
Government Expenditure	-75.66710	22.02144	-3.436	.0056
F-Bounds Test Null Hypothesis: No Levels Relationship				
Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	6.558462	10%	3.374	4.512
k	4	5%	4.036	5.304
Actual Sample Size	34	1%	5.604	7.172
t-Bounds Test Null Hypothesis: No Levels Relationship				
Test Statistic	Value	Significance	I(0)	I(1)
t-statistic	-4.878487	10%	-3.13	-4.04
		5%	-3.41	-4.36
		1%	-3.96	-4.96

Source: Research Data 2020

From table 4.11; the long-run model corresponding to ARDL (2, 4, 3, 4) for the relationship between external debt stock, external debt service and government expenditure on economic growth shows that external debt stock had a positive but statistically insignificant coefficient implying that in the long run, external debt stock had a positive effect on economic growth in Kenya. Debt service coefficient had a negative but insignificant with economic growth and government expenditure a negative and significant effect on economic growth in Kenya.

This finding was in support of a study by Frimpong and Oteng-Abayie (2006), whose findings showed that GDP positively relates to debt inflows and negatively with debt servicing hence the existence of crowding out effect and debt overhang found through the negative impact of the domestic investment. Nevertheless, contrary to an earlier study on Asian countries by Mustafa and Rifaqat (2012), which investigated the impact of external debt accumulation on economic growth in Pakistan. The study adopted the extended production function model and found a long-run relationship between external debt and economic growth.

4.9 Error Correction Model (ECM) Estimator Tests Results

Given the evidence of a long-run relationship among the variables as shown by table 4.11, the study further carried out the Error Correction Model (ECM) test to find out the short-run effect relationship among the variables as was shown in table 4.12.

Table 4.12 Error Correction Model Results

Selected Model: ARDL (2, 4, 3, 4): Sample: 1980 2017: Observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	446.1818	66.74209	6.685165	0.0000
D(GDP(-1))	0.308291	0.142084	2.169782	0.0528
D(EXD)	-4.698747	2.356454	1.993991	0.0715
D(EXD(-1))	-5.434020	2.977689	-1.824912	0.0953
D(EXD(-2))	-5.698720	2.600662	-2.191258	0.0509
D(EXD(-3))	7.530565	2.104900	3.577634	0.0043
D(DS)	-11.34514	4.255365	-2.666079	0.0219
D(DS(-1))	16.65031	5.332061	3.122679	0.0097
D(DS(-2))	-13.57871	4.256210	3.190328	0.0086
D(GE)	-0.893904	9.429514	-0.094798	0.9262
D(GE(-1))	43.44556	10.01997	4.335896	0.0012
D(GE(-2))	42.40301	10.59265	4.003059	0.0021
D(GE(-3))	26.96519	7.925768	3.402218	0.0059
Coint Eq (-1)*	-1.115087	0.166753	-6.687061	0.0000
R-squared	0.855407	Mean dependent var		0.104514
Adjusted R-squared	0.681894	S.D. dependent var		2.390259
S.E. of regression	1.348126	Akaike info criterion		3.734645
Sum squared resid	27.26166	Schwarz criterion		4.587611
Log likelihood	-44.48897	Hannan-Quinn criter.		4.025531
F-statistic	4.929953	Durbin-Watson stat		2.291043
Prob(F-statistic)	0.001560			

Source: Research Data 2020

The fourth null hypothesis (H_{04}) hypothesis of the study stated that there is no significant long-run relationship between the dependent and the independent variables. The short-run relationship between the dependent and the independent variables was explored using Error Correction (ECM), which explained the speed of adjustment in restoring the equilibrium in the dynamic model with a negative sign.

From table 4.12, the short-run coefficients of the study variables indicated that external debt stock had a positive and significant coefficient with a value of 7.531 and a p-value of 0.0043 ($p < .05$). This shows that there is a statistically significant positive relationship between external debt stock and economic growth in the short run. This implied that in the short-run a 1 percent increase in external debt stock leads to 7.531 increase in economic growth. This implied that external debt improves economic growth in Kenya in the short-run to mean that freshly borrowed debt affects the economy positively but accumulated debt does not have a major impact on the growth. The results of the study corroborate the studies by Shah and Pervin (2012) on the effect of external debt stock on economic growth in the short-run and long-run for 1974 to 2010 period in Bangladesh. The results indicated that in the short-run, external debt impacts GDP positively and therefore there was no evidence of debt overhang so long as external debt stock does not negatively affect economic growth. Nonetheless, crowding out effect is experienced due to the negative effect of debt service to creditors due to debt stock accumulation, which causes the service payment to increase. On the contrary, Mustafa & Rifaqat (2012) study on the investigation of the impact of external debt accumulation on economic growth in Pakistan found a negative long-run relationship between external debt and economic growth. This means that high external debt stock ratio to GDP leads to the low economic growth rate. The finding concurred with other studies such as Iyoha (1999), Elbadawi *et al.* (1996) and Akram (2011).

The coefficient of the second independent variable; debt service also reveals a negative sign with a coefficient of -13.579 and a p-value of 0.0086 (>0.05) hence it was significant. This implied that a 1 percent increase in debt service leads to 13.578 decreases in economic growth. The implication of this is that debt service payments reduce output growth directly by reducing productivity. The findings of this study concur with the studies by; (Chowdhury, 2001; Frimpong & Oteng-Abayie 2006; Polly, 2009; Malik *et al.*, 2010 and Akram, 2011) which found a negative relationship. These results are in contrary to those studies by; Swamy (2015), Zaman and Arslan (2014), Clements *et al.*, (2003), and Nakitami & Herera, (2007) that found positive relationships between external debt service and economic growth.

In addition, the coefficient of the third independent variable in the study is positive as it was in the expectation. The value of the coefficient of GE is 26.9519 with a p-value of 0.0059 (<0.05) hence it was significant. This implies that in the short-run, a 1 percent increase in GE leads to 26.9519 increase in economic growth. This reveals that in Kenya GE is favourable to economic growth in the short-run.

Furthermore, the results also indicated that the goodness of fit for the short-run model was satisfactory as supported by R squared of 0.86. This showed that the short-run effects of the independent variables explained about 86 percent of the change in economic growth and the remaining 14 percent explained by the error term. The coefficient of most importance in the short-run analysis was that of the ECM. In this study, ECM was negative (-1.115087) and statistically significant ($p = .000$) at 5 percent level of significance. The estimated value of the coefficient of ECM implied that about 112 percent of the disequilibrium in GDP was offset by the short-run adjustment within the same period implying that the speed of adjustment was very high. Therefore, based on the results of this study, the fourth null hypothesis was rejected and the alternative

accepted. Therefore, this was an indication of a short-run relationship between the dependent and the independent variables as supported by Lutkepohl, 2005 study. Shah and Pervin (2012) examined the effect of external debt stock on economic growth in the short-run and long-run for 1974 to 2010 period and observed that in short-run, external debt impacted Gross Domestic Product positively and therefore there was no evidence of debt overhang so long as external debt stock does not negatively affect economic growth.

CHAPTER FIVE
SUMMARY OF FINDINGS, CONCLUSIONS AND POLICY
RECOMMENDATIONS

5.0 Overview

This section of the study presents a summary of the findings, conclusions and policy implications as well as suggestions for further research were covered.

5.1 Summary of the Findings

The main purpose of this study was to determine the effect of external debt and government expenditure on economic growth in Kenya, using data set for thirty-eight years (38), for the period 1980 to 2017 using ARDL approach. Descriptive statistics were carried out to check for outliers and have an overview look of the study variables. Augmented-Dickey-Fuller and Phillips-Perron unit tests were used to check for the presence of unit root. Some variables were stationary at levels and others were non-stationary but after first difference, they became integrated, therefore the variables in this study were integrated of order zero $I(0)$ and order one $I(1)$. The ARDL model was estimated at four lags as suggested by Akaike Information (AIC) criterion.

The ARDL regression results showed that the coefficients of the external debt stock showed a negative significant impact on economic growth ($\beta = -7.5305$, $p = 0.0196$). The results were further supported by the error correction model test, which found a statistically significant long-run relationship between external debt stock and economic growth ($\beta = -7.530$, $p = .0043$). However, this was not supported by the paired statistics, which showed that GDP did not granger caused EXD and vice-versa ($\beta = 26.96519$, $p = 0.0385$).

Secondly, the coefficient for external debt service showed a negative significant impact on economic growth ($\beta = -13.5781$, $p = .0477$). The results were further supported by the error correction model test, which found a statistically significant long-run relationship between external debt services and economic growth ($\beta = -13.57871$, $p = .0086$). In addition, the results were supported by the paired statistics which showed a unidirectional causality that GDP granger caused DS significantly ($F = 2.93$, $p = .0404$).

Thirdly, the coefficient of government expenditure had a statistically significant positive effect on economic growth in Kenya ($\beta = 26.96519$, $p = 0.0385$). The study also found that there was a long-run relationship between the independent variables and economic growth. The F-Bound tests value was 6.558462, while at 5 percent level of significance lower and upper the critical values were 4.036 lower bound (1(0)) and 5.304 upper bound 1(1)). In addition, there was a positive relationship between external debt stock and economic growth similar to government expenditure but debt service was negatively related to economic growth. In the long-run, external debt stock was positively related to economic growth, debt service and government expenditure had negative relationships with economic growth.

5.3 Conclusions

In conclusion, the first null hypothesis that external debt stock had no significant effect on economic growth in Kenya was rejected. The study found that external debt stock had a statistically significant negative effect on economic growth. The results were further supported by the error correction model test, which found a statistically significant long-run relationship between the two but not supported by the paired statistics, which showed that Gross Domestic Product does not granger cause External Debt Stock and vice-versa.

The second null hypothesis, which stated that external debt service had no significant effect on economic growth in Kenya, was also rejected because this variable had a negative and statistically significant effect on economic growth in Kenya. The results were further supported by the error correction model test, which found a statistically significant long-run relationship between the two. In addition, the results were supported by the paired statistics, which showed a unidirectional causality that GDP granger causes DS significantly.

The third hypothesis stated that government expenditure had no significant effect on economic growth in Kenya. The study found that Kenya's government expenditure had a positive statistically significant effect on economic growth. The results were supported by the error correction model test, which found a statistically significant long-run relationship between the two. However, the results had no support from the paired statistics, which shows no causality between the two variables. The results were supported by the error correction model test, which found a statistically significant long-run relationship between the two. However, the results had no support from the paired statistics, which shows no causality between the two variables.

The fourth hypothesis for this study stated that there was no long-run relationship between the dependent and the independent variables. Similarly, this hypothesis was rejected and the alternative accepted due to the evidence from the regression results, which revealed that there was a long-run relationship between these variables as shown by the F-test statistic, which was greater than the upper bound of the critical value at 5 percent level of significance.

Besides, the study found that the error correction term was negative and significant implying there was a long-run relationship. The short-run and long-run coefficients

indicated that in the long-run external debt stock had a positive but not significant effect on economic growth but debt service and government expenditure had negative effects while in the short-run, external debt stock and government expenditure had positive effects but debt service harmed economic growth.

5.4 Contribution of the Study

In general, the study would be important to the government in understanding the impact external debt would have, if not put into those projects, which are development enhancing in the country. Furthermore, the accumulation of external debt stock may not be favourable to economic growth due to the need for repayment, which leads to a negative effect. In addition, the study would fill the knowledge gap existing in the empirical and theoretical literature related to external borrowing and economic growth. The findings of this study contribute to knowledge on the effect of external debt on economic growth. In addition, it has several implications on the policymakers and practitioners of economics and the theory of economic growth. This section of the study focused on the contribution of the study to existing knowledge, policy and practice and theory.

The findings of this study add to the existing knowledge on the effect of external debt on economic growth. The findings that both external debt and debt service had negative coefficients and significant effects on economic growth and that government expenditure have a positive significant effect form part of the additional knowledge on the effect of external debt on economic growth. Besides, this study forms part of the empirical literature for the academicians of economics. The study findings are of value to the policymakers in Kenya in that it will help them to make proper policies on the allocation of the externally borrowed funds to ensure that it is allocated into growth-enhancing projects to aid in the economic growth of the country. In addition, the

findings of the study that in the long run external debt stock has a positive but insignificant effect, external debt service has a negative effect and government expenditure should be of great interest to the policymakers.

This study was guided by the Solow growth Theory. This study contributes to this theory through the results of the external debt stock and external debt service, which both harm economic growth, implying that borrowed funds, servicing of the same plus its interest hurts economic growth in Kenya, and therefore the findings of this study are in support of the theory.

5.5 Policy Recommendations

The findings of this study add to the existing body of knowledge on external debt stock, external debt service, government expenditure and economic growth. The spurring contribution of the study is that the independent variables jointly predict economic growth precisely. The finding that external debt stock and debt service relates negatively with economic growth is an exciting observation, despite enough empirical evidence that all developing nations have to borrow externally.

The existence of a negative relationship between external debt stock and economic growth and the negative relationship between debt service and economic growth in Kenya should be of major concern for the Kenyan government. The study recommends that external borrowing needs to be contained to prevent the debt overhang problem since debt overhang leads to high interest rates and crowding out of the private sector from investment.

Furthermore, due to the positive effect of government expenditure on economic growth, the study recommended that the government must direct its spending to the productive sectors that will enhance the economy, such as increasing expenditure on rural

development, infrastructure, and education and agriculture sectors. The government should allocate resources to the area of physical infrastructural development to stimulate economic growth as envisaged in vision 2030 blueprint. This is because additional expenditure on capital projects contributes significantly to economic growth by increasing marginal productivity.

5.6 Suggestions for Further Research

Other than the effects of external debt stock, external debt services and government spending on economic growth, there is a need to investigate other effects of external debt on private investment in Kenya necessary for economic growth. There is also a need to undertake more studies in other developing countries, the EAC or COMESA countries to compare and corroborate the results of this study.

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APPENDIX

Appendix I: The Data used in the Study

Year	External Debt Services (DS)%	External Debt Stock (EXD)%	Government Expenditure (GE)%	Gross Domestic Product (GDP) growth %
1980	6.154031163	48.08467757	106.3361118	5.591976207
1981	7.304507989	48.61775157	103.2378741	3.773544197
1982	8.043379724	54.52025869	103.7962755	1.506478254
1983	8.896563807	62.6776755	100.4910029	1.309050242
1984	9.664834395	58.64600802	101.4177086	1.755216977
1985	10.4832552	70.5628286	101.0274611	4.30056182
1986	9.676933123	65.77000638	100.0098757	7.177555391
1987	8.989735558	75.20142743	105.1114781	5.937107446
1988	9.184141047	72.33410126	105.3968276	6.20318382
1989	8.817584297	73.25847594	111.8037651	4.690348768
1990	9.637027563	85.96928112	105.1961972	4.192050974
1991	9.248776956	95.82888558	101.2562364	1.438346791
1992	8.533036847	87.82322299	99.90736255	-0.79949396
1993	11.7209037	131.8995974	95.21636696	0.353197256
1994	12.98727893	104.9897858	96.86455653	2.632784519
1995	10.36458332	83.761807	105.9244183	4.406216526
1996	7.087052179	57.64590378	106.2539426	4.146839267
1997	5.074197416	49.94770177	107.8566764	0.47490192
1998	4.74557514	48.87203414	110.6366864	3.290213723
1999	5.459477611	51.29301364	109.8547411	2.305388596
2000	4.714499483	48.89036731	110.7591544	0.599695392
2001	3.781371929	42.81088137	114.3335611	3.779906496
2002	4.08142625	46.80596224	110.8306861	0.54685953
2003	3.943691084	45.57108842	111.7326482	2.932475546
2004	2.246711012	43.35280054	110.3472494	5.104299776
2005	2.886688654	34.62991823	110.4292853	5.906666082
2006	1.673041701	25.94367725	109.2123643	6.472494299
2007	1.435897171	23.69542463	109.9412508	6.850729771
2008	1.152162104	21.35701579	110.6142507	0.232282746
2009	1.051119972	23.12055745	110.7983831	3.306939815
2010	1.007870217	22.20081764	112.1647286	8.405699224
2011	1.042682978	24.21891972	114.523186	6.10826372
2012	1.119028388	23.69869263	114.0667095	4.563209131
2013	1.030586176	25.38873035	114.9907799	5.878680567
2014	2.06821651	28.01161323	116.2188121	5.357125643
2015	1.441022783	31.21135691	114.4034766	5.718507134
2016	1.652976056	31.80730588	110.0244295	5.878949299
2017	2.0511169	35.65084303	113.1008356	4.862538221

Source: IMF, WB, CBK.