DETERMINANTS OF EXTERNAL PUBLIC DEBT SERVICING IN KENYA (1980-2019)

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A RESEARCH PAPER SUBMITTED TO THE SCHOOL OF ECONOMICS IN PARTIAL FULFILMENT OF THE REQUIREMENTS OF THE AWARD A MASTER OF ARTS DEGREE IN ECONOMICS OF THE UNIVERSITY OF NAIROBI

DECEMBER 2020

Declaration

I declare that this is my original work and it has not been presented for a degree award in any other university.

Sign……..Date…….

Stephen K. Kimongo

X50/71873/2008

Supervisor

This paper has been submitted for examination with my approval as a university supervisor.

Sign……..Date…….

Thomas Ongoro, DSC

School of Economics, University of Nairobi

Dedication

I dedicate this project to my children and pray they'll be able to understand the weight of debt servicing issues facing both individuals and their motherland country Kenya.

Acknowledgement

First, I take this profound opportunity to thank the Almighty God for enabling me to accomplish this task.

Secondly, I acknowledge the support from the School of Economics, University of Nairobi, specifically the guidance and advise from the supervisor Dr. Thomas Ongoro and by extension the director Prof. Anthony Wambugu.

Finally, I thank all the research assistants and typists to my work and wish them all the best in their future endeavors.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Acronyms

BOP	Balance of Payment
CBK	Central Bank of Kenya
EIB	European Investment Bank
GDP	Gross Domestic Product
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IMF	International Monetary Fund
KIPPRA	Kenya Institute of Public Policy Research and Analysis
KNBS	Kenya National Bureau of Statistics
LDCs	Least Developed Countries
OLS	Ordinary Least Square
VAR	Vector Autoregressive
VECM	Vector Error Correction Model
WTO	World Trade Organization

Abstract

For the last one decade, Kenya has been facing an upsurge in the public debt which has seen the country plunge into debt crisis. As at the first week of April 2020, Kenya's debt to GDP ratio had reached 70 percent, the highest ratio in the country's history. Consequently, the high debt burden places huge responsibility of debt repayment which is likely to compromise the development agenda. Nevertheless, researchers have paid limited attention on determinants of debt service not only in Kenya but, the world at large. Thus, the study sought to investigate determinants of public debt service in Kenya. The study adopted a debt-servicing capacity framework attributed to works of Klein and Verbeek (1990). The study applied Autoregressive Distributed lad (ARDL) model to investigate determinants of external debt service in the short and long term using data covering 1980-2018. The data was collected from Kenya National Bureau of Statistics (economic surveys and statistical abstract), World Bank, International Monetary Fund, and Transparency International. Results indicate that net capital inflows, government deficit as a percentage of Gross Domestic Product, economic growth rate, interest rate determine external public debt service in both the short and long run periods. In addition, results for exports was found significant in the short run model while both unemployment and corruption were insignificant. The study recommends tightening of macroeconomic policies to reduce external public debt service burden. In addition, the government should create a conducive environment for foreign direct investment and/or encourage capital inflows as a remedy to external public debt service. The govenement should also encourage the creation and adoption of robust export policies that will boost Kenya's export trade.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

While borrowing is inevitable for countries like Kenya which have perennial budgetary deficits, servicing of borrowed loans is very critical. Failure to repay especially external debts could lower the country's credit rating which reduces the ability to access loans or the country is compelled to borrow at more stringent terms such as high interest rate. This might compound the problem even further. Therefore, effective management of government debts including servicing is paramount. While the reasons for government borrowing are clear, there is limited evidence on factors determining debt repayment. An understanding of these factors will help policy makers to formulate effective debt management regulations.

Kenya's debt servicing rates are related to the amount of external public debt owed to her debtors. Higher debt means the country pays more to the lenders. This is the simple principle upon which this research is based. Kenya started servicing of external debts right from independence. The country experienced rapid economic growth between 1963-1973, which was termed as the golden period for Kenya's economic growth (Kiama, 2010). This period recorded Gross Domestic Product (GDP) growth of 6.5%, and the per capita income remained high notwithstanding the ballooning population.

In addition, the country reported healthy balance of payment (BOP) and the rate of inflation was maintained at 3%. There was an average growth of exports of 13% per year. With regard to debt service, the ratio to exports was the lowest in the Kenyan history in early 1970s, and this was not a major concern. In fact, it was lower than the average debt service for African countries which was at 10% in 1972 (KIPPRA, 2013). Nevertheless, the crisis of oil which dates back in 1973/74

brought a new picture. The crises came with adverse effects in the BOPs of most development countries with Kenya as an example. Fiscal surpluses that were common in Kenya disappeared and the country had to increase borrowing to finance budgetary deficits which have now become perennial (KIPPRA, 2013). For instance, the external debt increased by 4.5% in 1973. However, in 1975, this growth in external debt reduce to 2.9% in 1975. The coffee boom of 1976/77 brought in a relief through a sudden increase in exports. This occasion a temporary decline in debt service in 1978. Nevertheless, this celebration was quickly halted following the second face of oil crisis brought about by deteriorated global product market. This lead to almost stagnation of Kenya's exports, and debt service became a challenge as there was a sharp increase in debt-GNP ratio.

The period beginning 1980's witnessed an increase in loan interest rates on the internal scale, which in turn increased debt service charges greatly. Kenya mainly borrows from the International Monetary Fund (IMF), World Bank (WB), and African Development Bank (ADB). The increased debt service charges became an obstacle for development in major developing countries. Majority of these economies experienced weak terms of trade coupled with BOP deficits. In addition, mismanagement of resources in Kenya riddled with rampart corruption became a stumbling block in the country's development agenda (Kohlscheen, 2005).

Public debt situation became worse in Kenya from early 1990's when both the World Bank and the IMF suspended funding to Kenya due to rampart corruption. This was the time when the country experienced Golden bag scandal. Following the suspension, Kenya sank deeper into financial crisis. There was reduced economic activities, export trade was severely affected and yet the country had to honor its international debt obligations.

Kenya's public debt has increased sharply for the last two decades. According to the Kenya annual budget report of 2013/14 Kenya's external stood at Kshs 843.6 billion. Kenya's debt burden has increased drastically in the last 5 years (2015-2019) due to the ambitious infrastructural projects. For instance, as of December 2008, Kenya's public debt increased to Ksh 867 billion comprising of Ksh 413.5 billion in external debts, and by December 2018, external debts stood at 2.568 trillion. According to the Central Bank of Kenya March 2020 bulletin, Kenya's public debt stands at Kshs 6.28 trillion. During the same period, debt service increased from Kshs 154 billion in 2015 to Kshs. 450 billion in principal and interest rate.

1.1.1 Debt Management in Kenya

There exists a legal and institutional framework for debt management in Kenya. These are what governs the servicing of the public external loans as well as domestic loans. These frameworks are governed by various acts such as Cap 422 which regulates external borrowing, Cap 420 for domestic loan regulations, and the CBK act (Cap 491). For instance, the domestic loans act gives the Treasury the responsibility to borrow funds internally on behave of the government. This is done through Treasury bills and bonds and other government facilities. However, the government has to determine borrowing limits because, over borrowing internally can lead to crowding out of private investment in the country.

On the other hand, the act on external loans guides management of external borrowing as well as debt servicing in the country. This is to ensure that the country borrows amounts of money which are reasonable, and for good purpose, and also ensure repayment without compromising economic growth and development of the country (KIPPRA, 2001). The law also sets external loans ceiling above which no further borrowing externally. For instance, by applying this Act, the government through parliament has set external debt ceiling to Kshs. 9 trillion in 2020.

The main objective of debt management is to ensure that the government is able to borrow reasonable amounts of money and invest such funds in productive activities. In addition, to ensure that the government is able to meet its external obligations failure to which it cannot borrow in future. Further, prudent management of public debt ensures that the government can access internal and global financial markets without a hitch. Government borrowings are guided by the limits set by the parliaments. For instance, under Guaranteed loans ACT (Cap 461), the loan limit was Kshs. 80 billion in 1963, and this limit has been revised from time to time, and to date, it stands at Kshs. 9 trillion.

1.1.2 External Debts in Kenya

For the last five decades, Kenya government has been borrowing to finance budgetary deficits that have become so common (Kirui, 2013). Kenya has experienced a steady increase in the public debt over time as indicated by Figure 1.1. At the end of 2019, Kenya's public debt had reached USD 59020 million with USD 2836 million domestic and USD 3066 million external debt (KNBS, 2019).

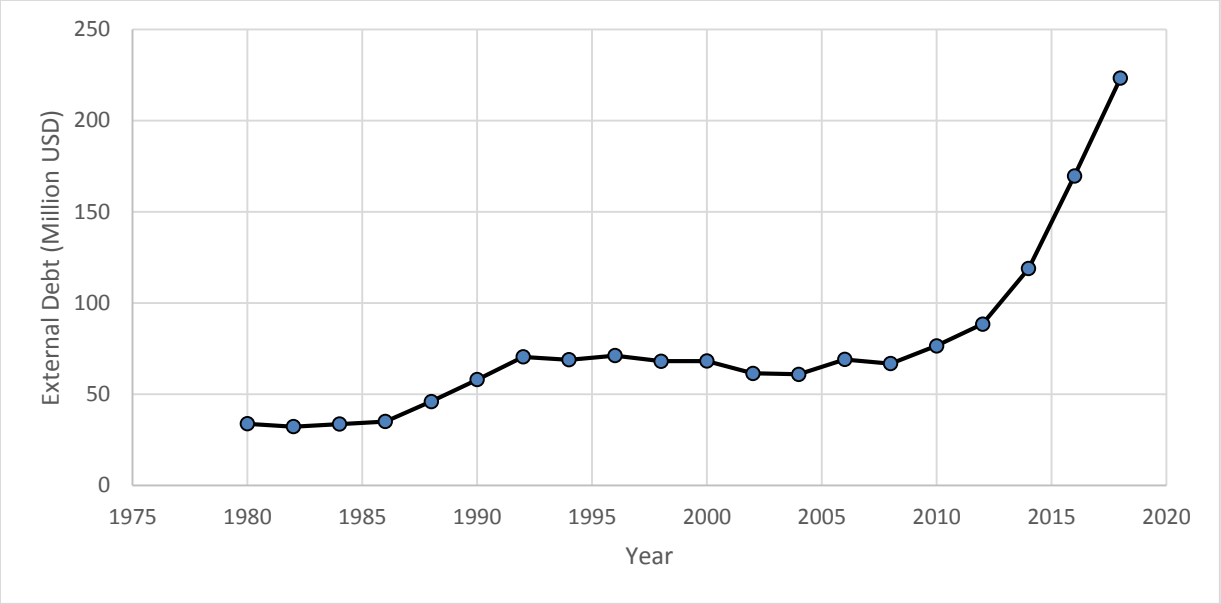

Figure 1.1: Kenya's External Debt (1980-2018)

Source: Economic Surveys (various issues)

In 1980's Kenya's external debt was more constant up to mid-2000 (Figure 1.1). However, from 2005 Kenya's external debts have maintained an upward trend. The current Jubilee government has been borrowing heavily to finance its ambitious infrastructure projects. This has resulted from the pressure to finance the current regime to support the projects geared towards fulfilling the election campaigns. Debt have risen to unsustainable which have even forced the legislature to review debt ceiling to Kshs. 9 trillion. This was to allow the government to borrow even more.

Increased external borrowing has also come with debt serving obligations. According to Figure 1.2, Kenya's debt servicing has also been increasing though, this increase in not comparable to external borrowing.

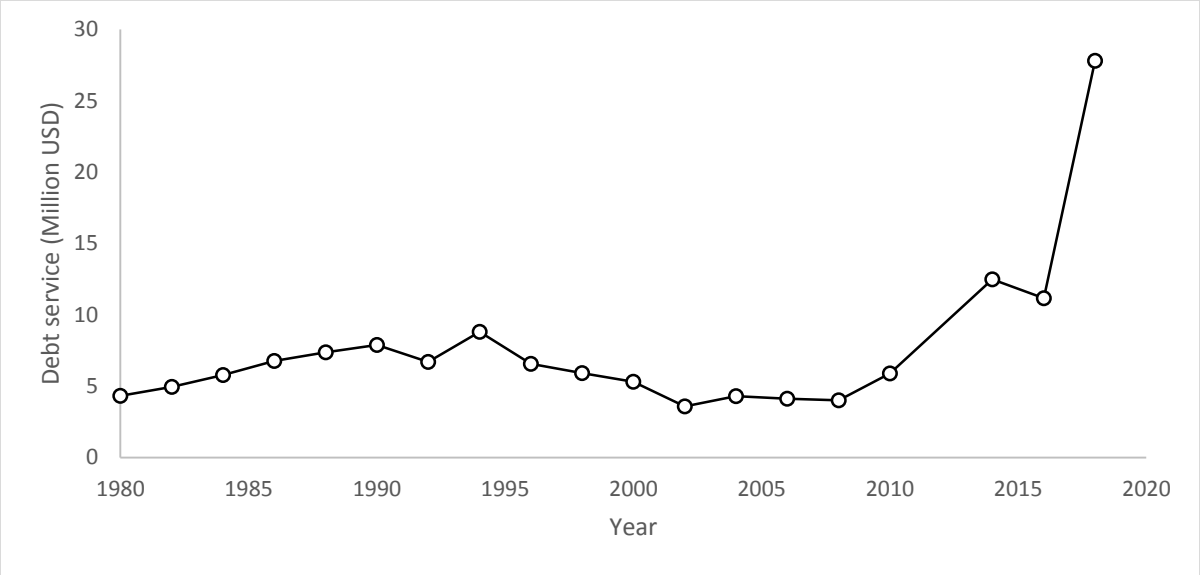

Figure 1.2: Kenya's External Debt Servicing (1980-2018)

Source: Economic Surveys (various issues)

Debt service for Kenya has been fluctuating from time to time especially between 1990's and mid 2000 (Figure 1.2). Currently, there is a remarkable debt servicing.

1.1.3 Factors Determining External Debt Service

Several macroeeconomic factors could explain a country's debt servicing. These factors may include government bugdetary deficits, Corruption Perception Index (CPI), Unemployment, Inflation, GDP growth rate, Real interest rate, exports, and capital inflows. For example, huge budgetary deficits are likely to compel the government to borrow more, and this is likely to lead to more servicng of external debts. Increase in corruption cases can reduce the amount of debt service since more money could be held by corrupt officers and hence leaving limited resources to service external debts. In addition, high rates of uneployment are likely to reduce external debt servicng. Inflation may slow down revenue generation and thus, reduce the amount of resources to be commited to debt servicing. Figure 1.3 indicates trends in budget deficits as a percentage of GDP, Corruption index, unemployment, and inflation. Apart from unemployment which has

largely remained constant between 1980-2018, values of other variables have fluactuated during this period. Budgetary deficits to GDP rate have remained below 5%. CPI curve indicate an increase in the corruption index from the year 2006 as opposed to more than 10 year back. This demonstrates efforts put in place in the fight against corruption.

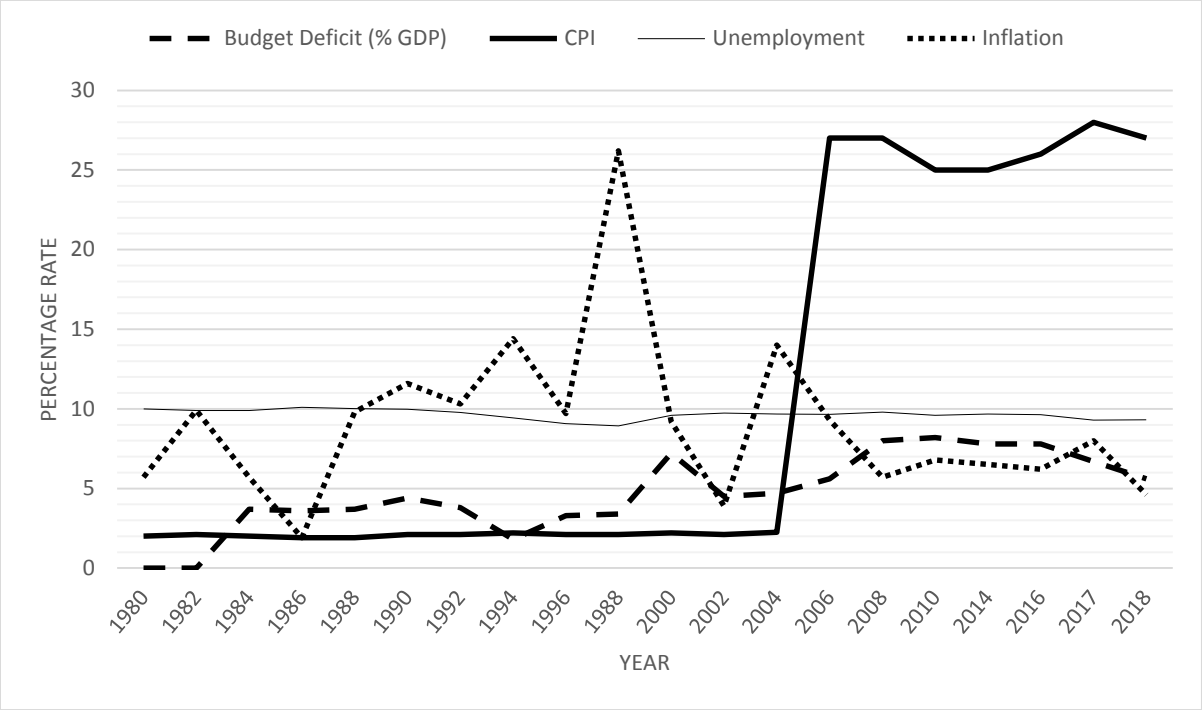

Figure 1.3: Budget deficit, CPI, Unemployment and Inflation (1999-2018)

Source: Economic Surveys (various issues)

Kenya's GDP growth rate had mixed performance with periods of lows and highs. For instance, according to Figure 1.4, the GDP growth rate was lower between 1980 and 2002 and later on picked up the momentum up 2007. In 2008-2009, the dismal performance can be attributed to the post-election violence which erupted following the 2007 general elections. Equally important to notice is that, real interest rate has maintained unpredictable trend during this period.

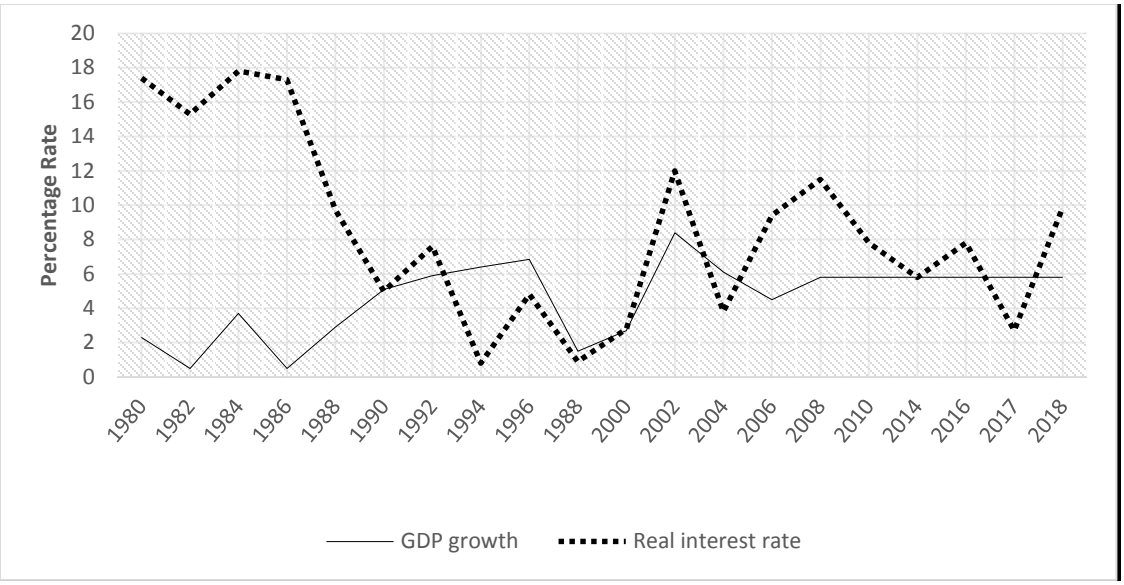

Figure 1.4: GDP growth Rate, and Real Interest rate (1999-2018)

Source: Republic of Kenya Economic Surveys and Statistical abstracts (various issues)

While Net capital inflows have largely fluctuated from 1980 to 2018, Figure 1.5 show that Kenya's exports have been rising with time. For instance, Kenya has witnessed an increase in exports from USD 27.87 million in 1980 to USD 166.73 million in 2018. During the same period, net capital inflows rose from USD 0.51 million to USD 16.25 million though with a lot of fluctuations.

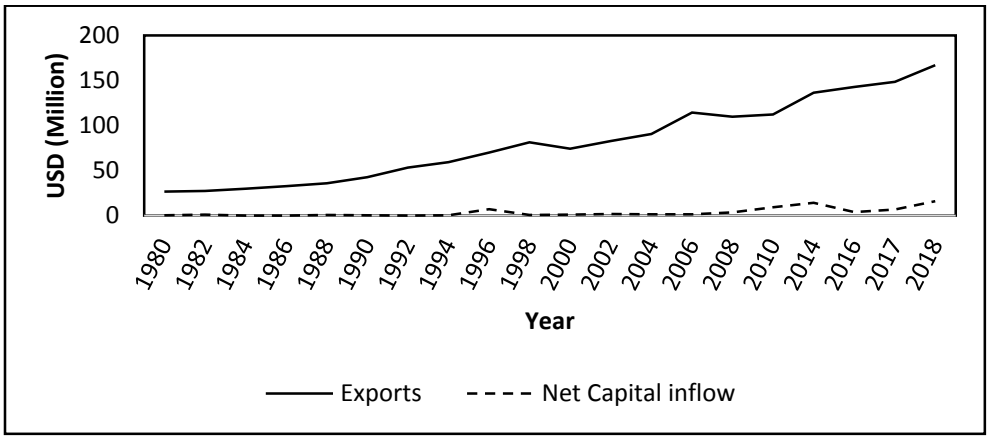

Figure 1.5: Kenya's Exports and Net Capital Inflows (1999-2018)

Source: Economic Surveys (various issues)

1.2 Statement of the Problem

Borrowing externally is inevitable for the majority of developing countries such as Kenya. This can be attributed to various factors like low saving rates, the slow pace of economic growth poor management of the macroeconomic environment. As a result, the government borrows both domestically, and externally to finance perennial budgetary deficits. As at the end of 2019, Kenya's public debt stood at Kshs 5.8 trillion accounting for 62 percent of the GDP (CIA, 2020). The domestic public debt was Kshs. 2.78 trillion while the external public debt was Kshs. 3.02 trillion. This borrowing comes with the obligation of servicing which has always proved to be burdensome in many countries. Payment of huge debt service constrains country's financial resources, and thereby compromising expansion of economic activities, and therefore, economic growth and development.

It is desirable for an economy to have a lower debt service to export ratio for healthy economic growth and development. Currently, Kenya has 10.6 percent of debt service to the export ratio which an increase from 5.3 percentage in 2013 (CIA, 2020). Several factors have been linked to changes in the debt service. Some of these factors include the amount of debt stock, inflation, the level of economic growth, capital flows, and interest on loans, corruption, and exports. Limited evidence on the determinants of debt servicing across the globe exist. Most studies have paid more attention on how debt service influence economic growth and not determinants of debt service. Others have concentrated on the capacity to service external public debt mostly in developing countries. Furthermore, this kind of evidence is scanty in the Kenyan context. Therefore, this study sought to fill these glaring gaps.

1.3 Research Question

What are the determinants of external public debt servicing in Kenya?

1.4 Research Objectives

The general aim of the study was to investigate the determinants of public debt servicing in Kenya.

Specific objectives are:

i. To establish the determinants of public debt servicing in Kenya.

ii. To offer policy recommendations based on study findings.

1.5 Significance of the study

Limited evidence exists on factors explaining repayment of public debts service in Kenya. The current study is expected to shed more light on what factors explain external public debt in Kenya. In addition, findings of the study are also expected to shape the policy framework towards the management of Kenya's public debts. In particular, study results will be used by policymakers in government to come up with policies which could strengthen Kenya's macroeconomics aimed are reducing the budgetary deficit and hence, borrowing.

Findings of the study are also going to be critical to investors in Kenya. Specifically, the knowledge of debt service determinants will be instrumental in formulating good policies for with regard to borrowing and loan repayment.

Furthermore, the results of the study could be used by other researchers to advance the debate on what determines public external debt service.

1.6 Organization of the study

Following the introduction chapter, the remaining chapters are organized as follows: Chapter two analyses literature which is divided into theoretical and empirical. In addition, the chapter ends with the overview of the literature, which explain research gap too. Chapter three explains describes the methodology to be adopted. This includes theoretical framework, empirical model, data and model estimation, and chapter four, details analysed data and discussions. Finally, chapter five presents summary, conclusion and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter details a review of the past studies related on the topic, "determinants of external public servicing. This is subdivided into three sections: section one presents a review of related theories, section two contains a reviews empirical findings ends with summary of the reviewed literature which established research gap.

2.2 Theoretical Literature Review

There are various theories which try to discuss the connection between external debts and other factors affecting the economy at large. For example, debt overhang hypothesis posits that certain levels of external borrowings can affect the economy positively (Krugman (1988). However, beyond certain levels, the economy is likely to be affected negatively due to the burden brought about by debt servicing. Similarly, this theory argues that positive economic growth is likely to reduce debt servicing. The implication of this theory is that counties with high level and sustained economic growth are likely to have lower debt burden.

The take-off theory by Rostow in 1950 held that for an economy to take off, there has to be a substantial amount of investment to be made. For countries with a credit problem, public borrowing becomes a good alternative. On their part, Harrod – Domar (1947) stated that foreign capital injection can be used to enhance the investment rate in developing countries by augmenting domestic savings and without lowering the level of domestic consumption. He advocated for foreign aid in boosting to ensure that Less Developed Countries (LDCs) can sustain themselves

economically. However, the theory is unclear on the role of a public dent in growth. Fei and Ramis (1968), used Hamod-Domar framework to investigate the flow of foreign assets required for a certain level of economic growth. In their analyses they reported that net capital inflows influence the level of a country's debt serving. For instance, more foreign investment in the domestic economy creates more revenues which can be used to repay external debt.

Rostenstain – Rodan (1961) noted that the flow of financial resources to developing countries from the developed world is critical for pushing these countries out of poverty. He was, therefore, giving a justification for foreign aid to developing countries. Though, Rostenstain – Rodan was of the view that any assistance in the form of loans could result in adverse effects on such economies.

Musgrove Rostow theory asserts that in early stages economic fronts public expenditure in the economy should be encouraged. This is because during the early stages of growth there exist market failures. However, the theory has been faulted by one group private sector contribution to development. Wagner theory of organic state argued that the growth of public spending was a natural consequence of economic growth. Wagner has viewed public expenditure as behavior variable that positioning responds to the dictates of the growing economy.

2.3 Empirical Literature Review

Various researchers have tried to explain what determine debt service in several countries across the world. To begin with, Frank and Cline (2010) applied time series methodology to investigate factors explaining debt service in 20 between 1980-2009. This study estimated results using Vector Error Correction Model (VECM) after confirming long-run relationship in the series. They reported that debt-export ration was positively related to debt service. In addition, they found that

GDP was positively related to debt service. The study concluded that increase in exports and economic growth rate was a remedy to external debt burden.

A study by Sargen (2017) used a longitudinal method to predict what factors explained debt servicing. Both domestic and external public debts of 44 economies in both developing and developed countries were investigated. By employing the debt-service model, the study discovered that payments of debts were largely explained by economies amount of exports. In addition, countries with fewer exports had a high probability of default or reschedule debt servicing. Furthermore, using monetary approach, the study reported a positive link between inflation and public debt service. The study therefore, concluded that inflation and exports were key determinants of a country's debt service.

In another study, Ajayi (1995) examined factors affecting external debt service. The study applied panel data methodologies on data for 30 countries between 1980 to 2008. A logit regression was applied in the estimation. Findings indicate that flow of capital to debt service ratio, the growth of exports, imports to reserve ratio, and per capita income had a significant impact on the external debt servicing. Similarly, a study by Mayo and Barrett (1992) applied a logit regression model on longitudinal data for 48 countries and established that GDP growth rate, disbursed external stock to the ratio of exports, reserves to import ratio, and inflation determines debt servicing. In particular, the study established that debt service and GDP were positively related. On the contrary, the study reported a negative effect of inflation to external debt servicing. Furthermore, Benedict et al., (2003) employed discriminant and logit models to examine factors explaining external debt default in 25 countries. The countries involved had either rescheduled repayments of the received

balance of payment assistance in the form of loans. Findings indicate that inflation, growth of reserves, and exports have a significant effect on debt service. However, the study did not disaggregate the debt into domestic and public external debts like the current study.

Mahmud, and Shahida (2012) examined factors determining debt servicing in some selected developing countries across the world. The study focused specifically on the factor driving countries not honour their debt obligations. The authors employed Vector Autoregressive (VAR) regression model to estimate results. Results of the study established that among the key factors explaining public debt servicing are the per capita income, export to GDP ratio, and inflation. In addition, the study found that countries with lower per capita income were more likely to default than those with higher GPD per person. Furthermore, inflation was found to affect external public debt service negatively. Another study conducted within the sub-Saharan region has established real capital inflows was very key in determining an economy's ability to settle her external debt obligations (Iyoha, 1999).

Ngassam (1991) conducted a study on factors influencing debt servicing ability among 45 African countries. The study used panel data methodology where it was established that reserve to import ratio, capital inflows, economic growth rate, and inflation is the key factors influencing the capacity of an economy to service its debts. In addition, the study found that inability to honor external debt obligation, was a major hindrance to country's economic growth.

According to Fedeli et. al (2012), evidence from OECD countries data show a link into long term unemployment and fiscal deficit. Ogonna et.al (2016), while using an auto regressive distributed lag approach, with data from Nigeria (1980 – 2015), indicate that "1% rise in an economy's public

debt leads to approximately 1.6% rise in unemployment". Fiscal policies of the state aimed at employment boost could correct this challenge according to Keynesian economics. In contrast, Monetarist and New Classical economists have differing policy visions. Monetarists acknowledge that the borrowing by the state to finance public expenditure or to tackle unemployment will create crowding-out effect and punish the private investments and employment. Taking a different approach towards the economic effects of public debt, New Classical economists claim that neither fiscal nor monetary policies are efficient.

Hull and Sargen (2011), argues that improvement in the balance of payment through exports is a key determinant of debt servicing in emerging economies. In addition, the study observed that a larger capital inflow of capital is a solution to the debt service burden facing developing countries. The study concluded a country's volume of international trade determines debt service in developing countries. However, the findings of this study could have been biased given that the estimation relied on Ordinary Least Square regression (OLS) which suffers from various challenges such as endogeneity, Multicollinearity and even heteroscedasticity.

Mohammad et.al (2001) examine factors determining debt service in South African countries. The study employed time series methods using data from 1960-1999. The study established various determinants of debt service. They included the level of tax rate, government expenditure, exports and the growth in GDP. While government spending was negatively related to debt service, the study reports that tax rate, exports and GPD were positively related to debt servicing among South African countries. The authors concluded that to avoid debt service burden, the countries are advised to enhance economic activities, and control expenditures.

Dias et al., (2014) investigated factors explaining public debt service. In using VECM, the study established that debt servicing was positively related to credit worthiness. This imply that countries with higher credit rating are likely to service their debts more than uncredited worthy

Several researchers have argued that corruption can affect both public debt stock and debt service. For instance, Tanzi and Davoodi (2002) found that corruption brings about more public expenditures which in turn affects government borrowing which affects debt service. According to Kaufmann (2010) argued that to optimize on rent seeking, officers of the government are likely to be inclined to towards huge capital investment as opposed to labour intensive. Consequently, if government expenditures are financed through by borrowing more, existence of corruption in the government increases debt service.

Kim E. et.al (2017), investigated the factors that influence of corruption on debt service using time series. The study used data from 77 countries covering a period of 1990 – 2014. The study established a negative link between corruption and external debt service. Corruption take away resources that could have been invested to generate more revenue for healthier debt management.

According to Wei (2001) corruption can increase the size of public spending as well as the composition of public spending. The study further noted that corruption can raise the public debt service debt. In the case in a reduction in the tax revenue, Wei explains that the government increases borrowing. This imply that when corruption increases a bigger percentage of the tax revenues would be consumed by corrupt officials, and hence, reduce revenues and more borrowing.

2.4 Overview of Literature

Several studies around the world have been reviewed in terms of theory, methodologies and the results. Generally, this literature indicates that more attention has been given to the relationship between debt service and economic growth and not what determines public debts servicing. There is limitation even on the theories explaining determinants of public debt servicing across the world. In addition, few of the studies related to the current study, have paid more attention to factors explaining debt service with none of the studies in Kenya.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Chapter three comprises of research methods used in the analysis of data. These includes theoretical framework, model specification, and definition of variables. The chapter ends with mode estimation strategy and diagnostic tests.

3.2 Theoretical Framework

The study adopted a debt-servicing capacity framework attributed to works of Klein and Verbeek (1990). The model has been used by various authors to analyze debt sustainability in many countries (see Cohen, 1999). Sustainability models hold that developing countries borrow to enhance physical capital or other assets or to smoothen consumption of goods and services. The models try to show various avenues through which debts affect economic growth over time.

To ensure that the economy is good trajectory, new borrowings in period say, D should be equal to the difference between investment (I), and savings (S) plus interest payment, iD expressed as:

$D = I - S + iD$ …….. (3.1)

Where i is the interest payment on borrowed funds (D)

Taking changes in the D per output for instance, as $d = {}^{D}/_{Q}$ leads to:

$d = \left({}^{I}/_{Q} - {}^{S}/_{Q}\right) + (i - g)s$ …… (3.2)

Where g is the growth in output expressed as? $g = {}^{Q}/_{Q}$

Following Solomon (1977), independent investment and savings equations can be specified. This enables to explain the amount of borrowing to fill the gap, and hence, time path for debt/output

ratio. This will be unbounded if$d > 0$ in each period. Nevertheless, Glick and Kharas (1986) argue that boundedness is needed however, condition for maintaining creditworthiness should exist.

The models are advantageous because they make use of production function to determine the output of determinants of output. Kharas (1984) noted that a country may have unsustainable debt path could exist due to various reasons. For instance, if the beginning value of $d$is high, while the first figures of capital and savings are low, then domestic savings may not be enough to pay interest on the debt.

Klein and Verbeek (1990) view this scenario as unsustainable debt levels. Low level of savings could worsen economic growth and even make it difficult for an economy to repay its loans.

3.3 Empirical Model

The study develops an empirical model based on debt sustainability model framework. External public debt servicing is expressed as a function of various hypothesized variables:

$$ds_t = \alpha_0 + \alpha_1 gdgr_t + \alpha_2 ntcinflows_t + \alpha_3 rintr_t + \alpha_4 corindex_t + \alpha_5 ngovdgdp_t + \alpha_6 expts_t + \alpha_7 infl_t + \alpha_8 unemp_t + a\varepsilon_t$$

……..…….. (3.3)

Where; ds= debt service,

$gdpr$ =GDP growth rate;

$ntcinflows$=net capital inflow;

$rintr$= real interest rate;

$corindex$=corruption index;

$expts$= exports

$ngovdgdp$ =net government deficit to GDP ratio

$infl$=inflation,

$unemp$=unemployment rate,

and

$\alpha_0, \alpha_1 - \alpha_6$= coefficients to be estimated.

The study therefore, regressed debt service on the GDP growth, net capital inflows, real interest rate, net government deficit, corruption index, exports and inflation. A link has been established between GDP and debt servicing. GDP is a measure of a country's potential wealth, productivity and return on investment. When the economy grows, more output could be realized and therefore, used to finance loan repayment. Debt servicing is likely to deprive the economy of resources for investment and hence, contract national income. This means that GDP is likely to have a causality link, negative or positive relationship with debt servicing.

Net capital inflows are likely to affect debt servicing either positively or negatively. This depends on the sign of these flows (positive or negative). More capital inflows, as opposed to outflows, is likely to increase investment and thus, more income and smooth debt servicing. They can also directly service external loans. The rate of interest in the economy is likely to explain debt servicing negatively. Higher interest means higher cost of servicing loans. The same observation is likely to be made with inflation. Inflation is an indicator of the quality of economic governance where a higher level of inflation brings tension or lack of confidence among the business community. Inflation can also have an adverse effect on foreign funds through its influence on the capital count. High corruption in an economy is likely to affect debt servicing. Corruption takes away resources meant for investment to generate revenues used to service debts. A reduction in exports could report a negative effect to debt service.

Government deficit to GDP ratio is a measure of the government's capacity to finance its activities from domestic resources. When the ratio of government deficit to GDP ratio increases, the country is likely to experience challenges in servicing debts.

The rate of unemployment has also been theorized to influence debt service. Unemployment is likely to have a negative effect on debt service. High level of unemployment imply low productivity which could have adverse effect on revenues and hence low debt service.

3.4 Description of Variables

Table 3.1 presents variables, their measurements and expected sign.

Table 13.1: Variables

Variable	Explanation	Measure	Hypothesized sign
ds	Debt service	Amount of debt service in Kshs.	
$gdpr$	Gross Domestic Product growth rate	Change in value of GDP as a percentage of GDP of the previous year	A positive sign is expected (Mayo & Barrette, 1992)
$ntcinflows$	Net capital inflows	This is calculated as the difference between capital inflows and capital outflows	A positive or negative sign is expected (Mahmud & Shahida, 2012)
$rintr$	Real interest rate	This is given	A negative sign is expected (Hull & Sargen, 2011)
$corindex$	corruption index	This is given	A positive sign is expected (Tanzi & Davoodi, 2002)
$unemp$	Unemployment Rate	This is given	A positive sign expected (Ogonna et al.,2016)
$expts$	Exports	Amount of Kenya's exports in Kshs.	A positive sign is expected (Frank & Cline, 2010)
$ngovdgdp$	net government deficit to GDP ratio	This will be measured as a budgetary deficit as a percentage of GDP	A negative sign is expected (Mayo & Barrette, 1992)
$infl$	Inflation	CPI index (given)	A negative or positive sign is expected (Sargen, 2017)

3.5 Estimation Method

Time series methodologies were adopted by the study. Time series enables the researcher to analyses the trend within the distribution and whether there are long-term or short-term relationships. Data analysis will be aided by Stata 14.0 version. Both descriptive and inferential

statistics were produced. Descriptive statistics took the form of means, standard deviation, minimum and maximum variable values as well as Skewness and Kurtosis analyses On the other hand, inferential statistics involved regression analysis. To ascertain the validity of the estimated results, diagnostic tests were conducted on the variables as well as the model.

3.5 Pre-Estimation Tests

3.5.1 Test for Unit Roots

Working with non-stationary time series is challenging in the sense that the study is either likely to overestimate of underestimating such its properties such as the mean, and standard deviation. This could lead to wrong inferences and conclusions. Non- stationary data might bring in spurious regressions (Riman & Eyo, 2008). Thus, before the actual data analysis, it is important to find out whether the series contains unit roots (stochastic trend) or not. In this study, the Augmented Dickey-Fuller (ADF) was used to test the unit-roots. ADF (1981) test the existence of unit roots test. ADF is the most widely used unit root. The unit root test confirmed that the series was cointegrated of zero (I (0) and one (I(1). These implied adoption of Autoregressive Distributed Lag (ARDL) model, and not either VAR or VECM according to Pesaran et al. (2001).

3.5.2 Cointegration Test

The study applied ARDL Bounds Test to Cointegration. This test was conducted because variables are declared stationary at two levels of integration, that is, I (0), and I (1). The test was carried out to find out the presence of cointegration in the model (null hypothesis). This hypothesis is rejected if computed F-statistics is less than the upper bound of critical values at all levels of significance and accepted otherwise.

3.6 Post-Estimation Tests

3.6.1 Autocorrelation

The study employed Langrange Multiplier (LM) test to check for the presence or absence of serial autocorrelation of the model residuals (Montgomery *et al.*, 2001). The test seeks to null hypothesis of no serial correlation in the model. A p-value of greater that 5% leads to acceptance of the null hypothesis.

3.6.3 Heteroscedasticity

The constancy of means and variances over time was checked using Breusch-Pagan-Godfrey. The null hypothesis of the test states that there is heteroscedasticity in the model residuals. This test was centered on Chi-square distribution (Wooldridge, 2006). The null hypothesis is accepted when p-value is greater than 0.05.

3.7 Data type and Sources

This study utilized secondary data from 1980 to 2019, which is published from the Kenyan government and other international agencies. Data on debt service, exports, GDP, inflation, government deficits, capital inflows, and real interest rate was obtained from the Kenya National Bureau of Statistics (KNBS) specifically in economic surveys and statistical abstract, World Bank and International Monetary Fund (IMF). Data on corruption index was be obtained from Transparency International database

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter contains results, discussion and interpretation. The chapter is subdivided into two subsections. Subsection 1 presents findings and discussion of descriptive statistics and subsection 2 comprises of econometric findings including diagnostic test analysis.

4.2 Descriptive Statistics

This subsection describes summary results of all variables considered in the study. The statistics analysed include mean, standard deviation, minimum and maximum values as well as coefficients of kurtosis and Skewness. These are presented in Table 4.1.

Table 4. 1: Descriptive Statistics

Variables	Mean	Std. Deviation	Min	Max	Skewness	Kurtosis
ds	67760.38	39754.63	34047.52	264175	3.4406	16.7731
gdpr	3.952094	2.2639	-.7994	8.4022	-.2659	2.1111
ntcinflows	19586.59	35824.47	37.4709	154462.5	2.6097	9.0849
rintr	7.396812	6.4828	-8.0098	21.0963	0.0816	2.8949
corindex	11.0245	12.0904	1.9	28	.5766	1.3462
unemp	9.6362	.3145	8.93	10.09	-.6204	2.6411
expts	3289736	1.78e+07	147440	1.11e+08	5.9991	37.0026
ngovdgdp	5.2116	1.9670	1.8	8.2	.2136	1.7988
infl	11.9725	8.5694	1.5543	45.9788	1.9753	7.8696

Source: Author's computation using Stata 14

Summary statistics presented in Table 4.1 show that external debt service had a mean of USD 67760.38 million with standard deviation of 39754.63 and this ranged between a minimum of USD 34047.52 million and a maximum of USD 264175 million. With regard to GDP growth rate, the

results indicate that during the period under study (1980-2018), the growth rate of the economy ranged between a minimum of -0.799494 and a maximum of 8.4022 with a mean of about 3.9. This imply that there was a time an economy recorded a negative growth rate.

Net capital inflow (ntcinflows) had a mean of USD 19586.59 million with a standard deviation of 35824.47 while the rate of interest rate (rintr) ranged between a minimum of -8.009867 and a maximum of 21.0963 with a mean of 7.396812.During the same period, Kenya's Corruption Perception index ranged between minimum of 1.9 and a maximum of 28 with standard deviation of 11.0245. This imply that generally, Kenya has scored low with regard to the fight against corruption. The rate of unemployment in Kenya ranged between 8.93 and 10.09 during the period under study with a mean of 9.6362.

Concerning exports, Kenya has recorded an average of USD 3289736 million with standard deviation of USD 1.78 million while during the same period, Kenya's budgetary deficit to GDP ratio (ngovdgdp) ranged between a minimum of 1.8 and a maximum of 8.2 with a mean of 5.2116. Finally, the average inflation in Kenya was 11.9725 with a standard deviation of 8.5694. In addition, during this period Kenya recorded a minimum inflation of 1.5543 and a maximum of 45.9788.

According to coefficient of Skewness, gdpr, rintr, corrindex, unemp, ngovdgdp, and infl variables indicate symmetric in distribution given that the values range between -2 and +2. On the other hand, ds, ntcinflows and expts indicate asymmetric distribution. With regard to Kurtosis,

gdpr, rintr, corrindex, unemp, and ngovdgdp, indicate symmetric distribution with the rest showing asymmetric distribution. This is because, for normal distribution, the coefficient of Kurtosis ranges from -3 and +3. In the next subsection, the study analyses econometric results.

4.2 Econometric Analysis

This subsection presents analysed econometric findings based on the study objectives. Since, the study utilized time series methods, it was imperative to first conduct unit root test to ascertain whether the variables were stationary or not. The study adopted Augmented Dicky Fuller (ADF) to test for stationarity. This was to make sure that no variable with unit root enters estimation because; unit roots in the series could result into spurious regressions. The test was conducted at two stages, namely, with constant only, and constant & trend. The hypothesis of the test states that there is unit root in the series. The hypothesis is rejected when the test statistics in the two steps are significant. If the results are not significant, the variable is differenced and then re-subjected to unit root test again. The results of unit root test are presented in Table 4.2

Table 4.2: ADF Test Results

Series	Order	Exogenous	ADF Test t-statistic (p value)
ds	Level	Constant	2.679 (0.9991)
		Constant & trend	2.237 (1.000)
	First Difference	Constant	-3.122 (0.0250)**
		Constant & trend	-3.584 (0.0312)
$gdpr$	Level	Constant	-3.315 (0.0142)**
		Constant & trend	-3.766 (0.0184)**
$ntcinflows$	Level	Constant	-1.358 (0.6023)
		Constant & trend	-2.770

			(0.2081)
	First Difference	Constant Constant & trend	-6.473 (0.000)*** -6.596 (0.000)***
$rintr$	Level	Constant Constant & trend	-4.255 (0.0005)*** -4.205 (0.0044)***
$corindex$	Level	Constant Constant & trend	-0.632 (0.8636) -2.139 (0.5242)
	First Difference	Constant Constant & trend	-4.470 (0.0002)** -4.411 (0.0021)**
$ngovdgdp$	Level	Constant Constant & trend	-1.706 (0.4279) -2.488 (0.3338)
	First Difference	Constant Constant & trend	-4.701 (0.0001)** -4.556 (0.0012)**
$expts$	Level	Constant Constant & trend	1.911 (0.0085) 0.756 (0.005)
$infl$	Level	Constant Constant & trend	-3.416 (0.0104)** -3.620 (0.0282)**
$unemp$	Level	Constant Constant & trend	-1.714 (0.4239) -1.944 (0.6315)
	First Difference	Constant Constant & trend	-3.496 (0.0081)** -3.392 (0.0525)

Note: *** and ** represent 1% and 5% levels of significance respectively.

Source: Author's computation using Stata 14

Unit root test results are instrumental in deciding which method of estimation to adopt. The results in Table 4.2 show that variables gdpr, rintr, expts and infl were found stationary at level, while ds, ntcinflows, corindex, ngovdgdp and unemp variables became stationary after differencing once. This imply that the series is integrated of order zero, I(0) and one, I(1). Therefore, the suitable model to estimate the external debt service equation is Autoregressive Distributed Lag (ARDL) model following Pesaran et al. (2001). To estimate results using ADRL model, first the study conducted ARDL Bounds Test to Cointegration in the next subsection.

4.2.1 ARDL Bounds Test to Cointegration

This test was conducted because variables were declared stationary at two levels of integration, that is, I (0), and I (1) as shown in Table 4.2. The test was carried out to find out the presence of cointegration in the model (null hypothesis). This hypothesis is rejected if computed F-statistics is less than the upper bound of critical values at all levels of significance and accepted otherwise. When F-statistic value falls between lower and upper bound critical values, then, the results are termed inconclusive. The Results of the test are presented in Table 4.3

Table 2.3: ARDL Bounds Cointegration Test

Level of Significance	Critical value		F-statistic
	Lower bound	Upper bound	
1%	3.15	4.43	23.521
5%	2.45	3.61	
2.5%	2.75	3.99	
10%	2.12	3.23	

Source: Author's computation using Stata 14

Findings of the test (see Table 4.3), indicate that F-statistic value is greater than all the upper bound values at all levels of significance. This imply the existence of cointegration in the model. Thus, both long run and short run relationships are assumed in the model.

4.2.1 Result Estimation

After cointegration test analysis, the study implemented ARDL model to estimate the debt service equation. The findings are presented in Tables 4.4 and 4.5 for short run and long run models respectively.

Table 4.4: Short run ARDL Results

Variable	Coef	Std. Deviation	t-statistic	P-value
Debt Service(lag)	-.5272244	.0881546	-5.98	0.027
Net Capital flows	-1.727596	.1639058	-10.54	0.009
Deficit(%GDP)	-.57	.11	-5.14	0.050
GDP growth	-.144	.015	-9.6	0.012
Real Interest Rate	1875.524	142.7081	13.14	0.006
Exports	-.5410004	.0430642	-12.56	0.006
Inflation	-2337.272	207.3203	-11.27	0.208
Unemployment	20.35991	1725.046	0.01	0.991
Corruption	315.3049	593.6047	0.53	0.599
ECT	-4.421345	.561938	-7.87	0.016

Source: Author's computation using Stata 14

Table 4.5: Long run ARDL Results

Variable	Coef	Std. Deviation	t-statistic	P-value
Net Capital flows	1.065377	.0329777	32.31	0.001
Deficit(%GDP)	6.35	1.043	6.088	0.032
GDP growth	.7565	.0535	14.14	0.008
Real Interest Rate	432.9784	25.93618	16.69	0.004
Exports	.0066508	.003182	2.09	0.172
Inflation	265.6443	29.39524	9.04	0.012
Unemployment	-.01991	.046	0.43	0.991
Corruption	.1249	.3047	0.41	0.599
_cons	-5280.415	5004.391	-1.06	0.402
Obs	40			
Adjusted R^2	0.9989			
Durbin-Watson	2.006			
Mean VIF	1.39			
Heteroscedasticity Test(white test)	38.68 (0.0677)			

Source: Author's computation using Stata 14

4.4.2 Discussion for ARDL Short and Long run models

According to the estimations, the error correction term (ECT) coefficient of -4.421345 and which is significant given the P-value of 0.016< 0.05, indicate existence of long run relationship in the model. Additionally, this term imply that shocks in the Kenya's external public debt service in the present time will be restored at an adjustment speed of about 442.1345 % or less than a year. In other words, it will take less than one year for disequilibrium in the debt public service to converge in the long term. The results for lagged variable of debt service (-.5272244, p-value=0.027) means that Kenya's previous external public debt service explains the current debt service by about 0.52%. The remaining percentage is attributed to other factors. This imply that that past external

public debt services largely determine the current external debt servicing negatively. External debt servicing deprives the economy of funds, which can be invested to generate more revenue, and hence, the economy becomes incapable of debt servicing.

According to the estimated results, net capital inflows determines Kenya's external debt service both in the short run (-1.727596, p-value=0.009<0.05) and in long run (1.065377, p-value=0.001). However, the sign of the coefficients indicate that in the short run, net capital inflow to Kenya has a negative relationship external public debt service but with time (long-turn), net capital inflows has a positive relationship with external public debt service. These finding imply that it capital inflows are invested in the short run and not necessarily used in external debt repayment but in the long-run, part of the revenues generated from such investments are used to repay external debts. Consequently, a country that has more capital inflows is less likely to borrow and hence, less external public debt service burden. Findings of this study are consistent with those Hull and Sargen (2011) who argued that capital inflows are a solution to a country's debt problem. In addition, Ngassam (1991), Ajayi (1995), and (Iyoha, 1999) established made similar observations in their study although it was not clear about the direction of the relationship between external debt service and capital inflows in their respective studies.

Concerning government deficit to GDP ratio, the study has established a negative relationship between the budgetary deficit and external debt service (-0.57) although the level of significance was, lower (10%). However, in the long run, government deficits are positively (6.35) related to external debt service and the results are significant at 5%. These findings imply that increase in government budgetary deficit is a major problem in the long run because. A huge budgetary means more external borrowing and thus, big external debt service.

The GDP growth rate variable was found significant both in the short and in long run given the p-values 0.012 and 0.008 respectively. However, the effect of GDP growth differs across the two periods. The estimated results indicate that GDP growth has a negative effect on external public debt service in the short run (-0.144) while in the long run, there is a positive relationship between the two variables (0.7565). In the short run, the government does not have an elaborate plan to borrow heavily in order to finance development expenditure and hence, the reason why the growth in the GDP is not accompanied by more external public debt servicing. However, in the long run, the government puts in place plans for investment, which requires heavy borrowing and hence, increased external public debt service. This situation could be more pronounced in a situation where borrowed funds are invested in infrastructural projects such as roads, railways that have longer pay back periods. Similarly, studies such as Frank and Cline (2010), Mayo and Barrett (1992), Mohammad et.al (2001) have demonstrated that GDP growth rate has a positive effect on external debt service in different countries around the world.

With regard to real interest rate, the study has established a positive relationship with external public debt service both in the short run and long run periods. This is indicated by the positive coefficients, that is, 1875.524 and 432.9784 for short run and long run respectively. In addition, these coefficients are significant at 5% level. Interest rates represents the cost of borrowing and therefore, a higher rate of interest imply higher debt burden. These findings reveal that real interest rate is a change to Kenya's external public debt service both in the long and short run periods.

The study further reveals that Kenya's exports determines the levels of external public debt service in the short run (-0.541, P=value 0.006). The results for long run equation are not significant. The negative coefficient indicate that an increase in Kenya's export leads to a decline in external public debt service. More exports brings in more revenue in terms of foreign currency which and therefore, enabling the economy to honour its external public debt obligations. In addition, more foreign exchange from the exports could stabilize macroeconomics such as employment, interest rate, exchange rate and lead to steady growth in the economy and hence, limited external borrowing. Similar results were observed by Mohammad et.al (2001) and Hull and Sargen (2011) who argued that enhancement of export trade is a remedy to a country's external debt service challenge.

The results of the study indicate that inflation is a key determinant of Kenya's external debt service. According to the finding, the rate of inflation has a positive relationship with debt service in the long run (265.6443, P-value=0.012). The coefficient is significant at 5% level meaning that an increase in the inflation level exerts more pressure on external debt service. Inflation could affect external debt service in two main ways. First, increase in inflation could raise the level of interest rate in the economy, which imply high borrowing costs. Secondly, high inflation can lead to limited economic activities due to its effect of purchasing power. If this happens, the economy cannot generate sufficient revenues to fund its budget and thus, more borrowing and subsequently, higher external debt burden. Finally, the variables for unemployment and corruption are not significant. This means that the study failed to establish whether corruption and unemployment levels in Kenya determine debt service.

To ascertain the validity of the results, various diagnostic tests were conducted. These included Multicollinearity, heteroscedasticity, autocorrelation and the test for model stability. The Durbin-Watson test value of 2.006 indicates absence of autocorrelation while the mean VIF of 1.39 imply that the model did not suffer from Multicollinearity. With regard to heteroscedasticity, the p-value of 0.0677 indicates that residuals are homoscedastic. Furthermore, plots of CUSUM (Figure 4. 1) statistics of the estimated equation are within the critical bounds of 5% level of significance. This means that the model passed the test for stability.

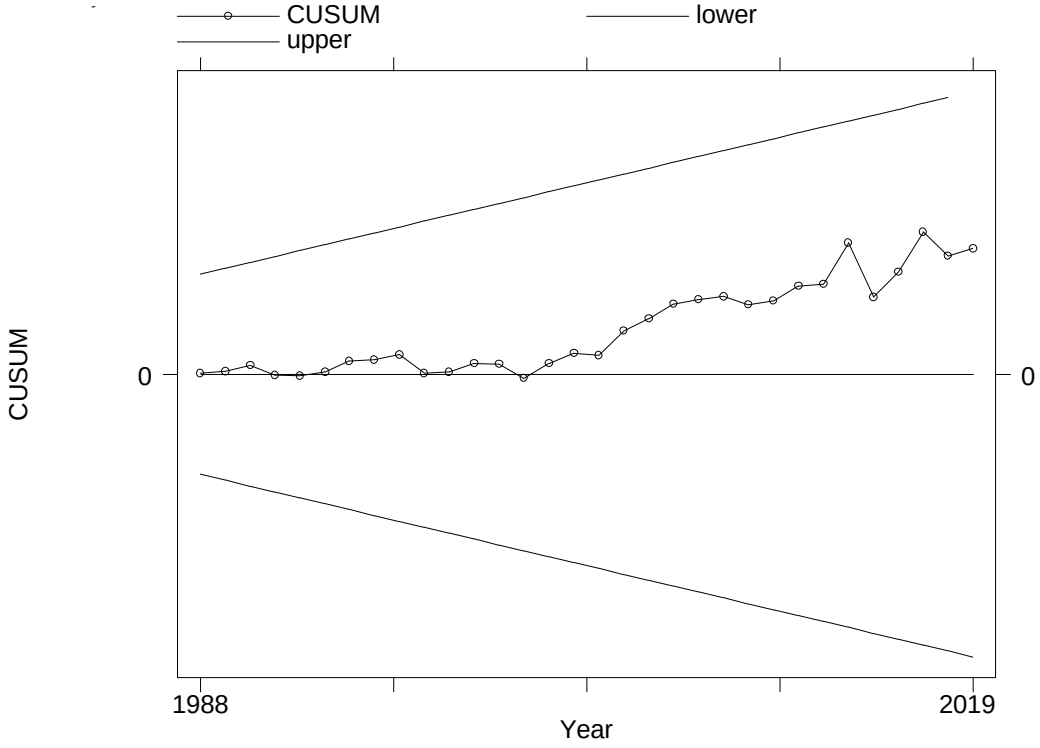

Figure 4.1: External Debt Service Model Plot of CUSUM

Source: Author's computation using Stata 14

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five of the study presents summary conclusion and policy recommendations of the study. The chapter begins with the summary of the study findings and then conclusion. Finally, policy recommendations are suggested.

5.2 Summary

There is no any country in the world that can claim to operate without external public borrowing. Therefore, external debts are necessary and especially for financially constraint countries like Kenya and which experiences perennial budgetary deficits. However, such borrowing comes with obligations for repayment. Kenya has in the past two decade experienced a surge in external debt. As a result, these has come with the responsibility of debt service. Even though the country has huge debt service obligations, there is limited information on the determinants of external debt repayment. The current study sought to address this gap.

The study applied ARDL model on data from 1980 to 2019 amounting to 40 observation to investigate the determinants of Kenya's debt service. The variables investigated include net capital inflows, GDP growth, real interest rate, exports, and government deficit as a percentage of GDP, inflation, unemployment and corruption index. Prior to the model estimation, unit root test was conducted with the aid of ADF to make sure that all variables entering the analysis are stationary. In addition, ARDL Bounds Cointegration Test was carried out and confirmed existence of at least

long run equation in the model. Post-diagnostic test such as autocorrelation, Multicollinearity, and Heteroscedasticity were conducted to ensure validity of the results and hence, inferences.

With regard to the estimated results, net capital inflows determine Kenya's external debt service both in the short and long run periods. In the short run, the relationship between the two variables was negative but they turned positive in the long run. The implication of these findings is that increase in capital inflows increases Kenya's debt obligations as part of these capital comes from overseas credit facilities. Similar results were observed with government deficit as a percentage of GDP. This means that government fiscal deficits with a positive sign on the coefficient is no a key challenge in the long run. This implies that the government borrows a lot in the long term as opposed to short term and hence, huge external debt obligation.

The study has also found GDP growth as a key determinant of Kenya's external debt service. according to the results, the level of economic growth as measured by GDP affects external debt service in short and long terms. The sign of the coefficient turned from negative in the short run to positive in the long run. This imply that, external debt services worsens in the long term when the country borrows more to invest in long term projects. With regard to real interest rate, the study reveals a positive relationship with external debt service in both short and long-term periods. This imply that interest rate has the same effect on external debt service both in the short and long time horizons. Specifically, an increase in the level of real interest rate leads to more external debt service obligations.

Furthermore, the study has established that Kenya's exports determines external debt service. However, this is only in the short run and the results for the long run equation are not significant. The negative sign of the coefficient imply that increase in exports leads to a decline in external

debt service. These findings are supported by Mohammad et.al (2001) and Hull and Sargen (2011) who argued that enhancement of export trade is a cure to a country's external debt service challenge.

Moreover, the results of the study indicate the rate of inflation determines external debt service. The positive coefficient of inflation indicate that an increase in the general prices raises the external debt burden. This is because, inflation has a positive effect on real interest rate and since, interest rate is the price for borrowing, higher levels of inflation could lead to more external debt service obligation. Finally, the study could not register significant results with regard to unemployment and corruption.

5.3 Conclusion

While external borrowing may have positive implications on economic growth and development, external debt service could have negative repercussions. The aim of the study was to investigate the determinants of external public debt service in Kenya. From the findings, this paper makes various conclusions. First, the study concludes that net capital inflows explain external public debt service both in the short and long term. Secondly, the study concludes the GDP growth rate, and Kenya's exports are key determinants of external public debt service. It has been noted that external public debt service increases with increased GDP growth in the long run. Thirdly, the study concludes that the real interest rate and inflation explain debt service.

5.4 Policy Recommendation

From the conclusions, the study makes the following policy recommendations:

1. There is need for the government to tighten macroeconomic policies to ensure stability. Policies targeting to stabilize interest rate, inflation and economic growth could be instrumental in reducing external public debt service.

2. The government should create a conducive environment for foreign direct investment and/or encourage capital inflows as a remedy to external public debt service.
3. Policies to encourage Kenya's export trade should be enhanced to reduce external public debt service.

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