EFFECT OF PUBLIC DEBT ON HOUSEHOLD CONSUMPTION EXPENDITURE IN KENYA

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DECLARATION

The project presented herein is my unique work and has not been previously submitted to any institution.

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ACKNOWLEDGMENT

DEDICATION

My project is dedicated to my parents; Alexander Micheni and Silvia Kaari for the sacrifices made to guarantee that I have everything I require and that I never lack.

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LIST OF ABBREVIATIONS

ADF	: Augmented Dickey Fuller
ADRL	: Auto-Regressive Distributed lagged
ASEAN	: Association of Southeast Asian Nations
CBK	: Central Bank of Kenya
ECM	: Error collection model
FDI	: Foreign Direct Investment
FEM	: Fixed Effect Model
FEPI	: Foreign equity portfolio investment
G7	: Group of Seven
GDP	: Gross Domestic Product
HDI	: Human Development Index
IMF	: International Monetary Fund
KNBS	: Kenya National Bureau of Statistic
LSDV	: Least Squares Dummy Variable
OECD	: Organization of Economic Cooperation and Development
OLS	: Ordinary Least Square
PMG	: Pooled Mean Group
SDG	: Sustainable Development Goals
SPSS	: Statistical Package for Social Science Software
UK	: United Kingdom
VAR	: Vector Autoregressive Model
VECM	: vector error collection model
VIF	: Variance Inflation Factor
WCED	: World Commission on Environment and Development
WDI	: World Development Indicators
WEF	: World Economic Forum

ABSTRACT

The purpose of this study was to determine the impact of public debt on Kenya's socioeconomic welfare. As a proxy for socioeconomic wellbeing, household consumption expenditure was utilized. Three theoretical models, namely the Overhang Debt Hypothesis, the Ricardian Equivalence Theory, and the Keynesian macroeconomic theory, serve as the foundation for this study. It utilized a quantitative research strategy based on a non-experimental research design. Data for the study was gathered from secondary sources, such as the IMF, KNBS, and World Bank. Data was analyzed by means of correlation analysis and OLS regression analysis in accordance with validity measures derived from the ADF Stationarity test and additional diagnostic tests. The size of the public debt has been observed to have no statistically significant effect on household spending. Debt servicing had a negative and statistically significant effect on household spending, while exchange rate had a positive and statistically significant effect on household spending. This study found that although public borrowing has a small positive effect on household spending, the effect is statistically insignificant. Even though the statistically significant and negative effect is small, it only occurs when debt service obligations begin to accumulate. The study discourages a government's reliance on debt as a primary source of financing due to the fact that its negative impact is not felt until the debt is repaid.

CHAPTER ONE

INTRODUCTION

1.1 Background information

Since the onset of the COVID-19 pandemic in November 2019, the world debt increased by a staggering $30 trillion and was expected to reach $295 trillion as of June 2021 (Lu, 2020; IMF, 2021). This increase has affected all countries around the world. In the United States, public debt grew to $28 trillion by end of March 2021, surpassing the country's gross domestic product (GDP). Intensive government borrowing saw a 131% rise in public debt in Europe's developed markets namely, the Euro Area and the United Kingdom increased by Q3 2020 (Lu, 2020). Conversely, the global debt-to-GDP ratio has surged to 105% for the global economy and 131% for the developed economies alone (Lu, 2020). Both rates have surpassed World Bank's recommended ratio of 77% beyond which any percentage increase in debt results to a 0.017 percentage points decrease in GDP growth (Lu, 2020). Only two emerging markets namely Russia and China were able to retain a ratio below World Bank's recommendation (Lu, 2020).
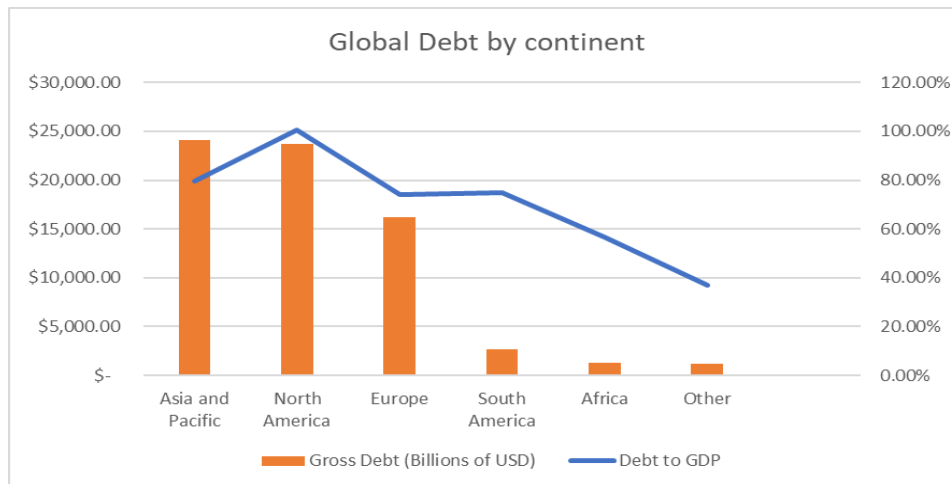
Figure 1.1: Proportion of World Debt by Continent

Source: Desjardins (2019)

Public debt levels in Africa have also been on the rise for the last few years before Covid-19 (The African Report, 2021). Zambia, for instance, reached a debt to GDP ratio of 120% in 2020, which shook the country's solvency and stability when coupled with the slowed economic activity amid the pandemic. The proportion of debt to GDP has also been on the rise among Eastern Africa Countries with an aggregate ratio of 59.2% as showed in Figure 1.2. Kenya is the third most indebted country in the region with 61.6% debt proportion flanking including Eritrea (165%) and Burundi (63.5%). A country like Zambia has seen too much debt threaten its stability and sovereignty (The African Report, 2021). This surge in public debt has been against the recommendation of the International Monetary Fund (IMF), which advises African and Asiatic countries to maintain a ratio of 60% or below for balanced economic performance (Abd Rahman, 2019). Twenty-one out of the fifty-five countries that make up Africa have surpassed this ratio (Faria, 2020).
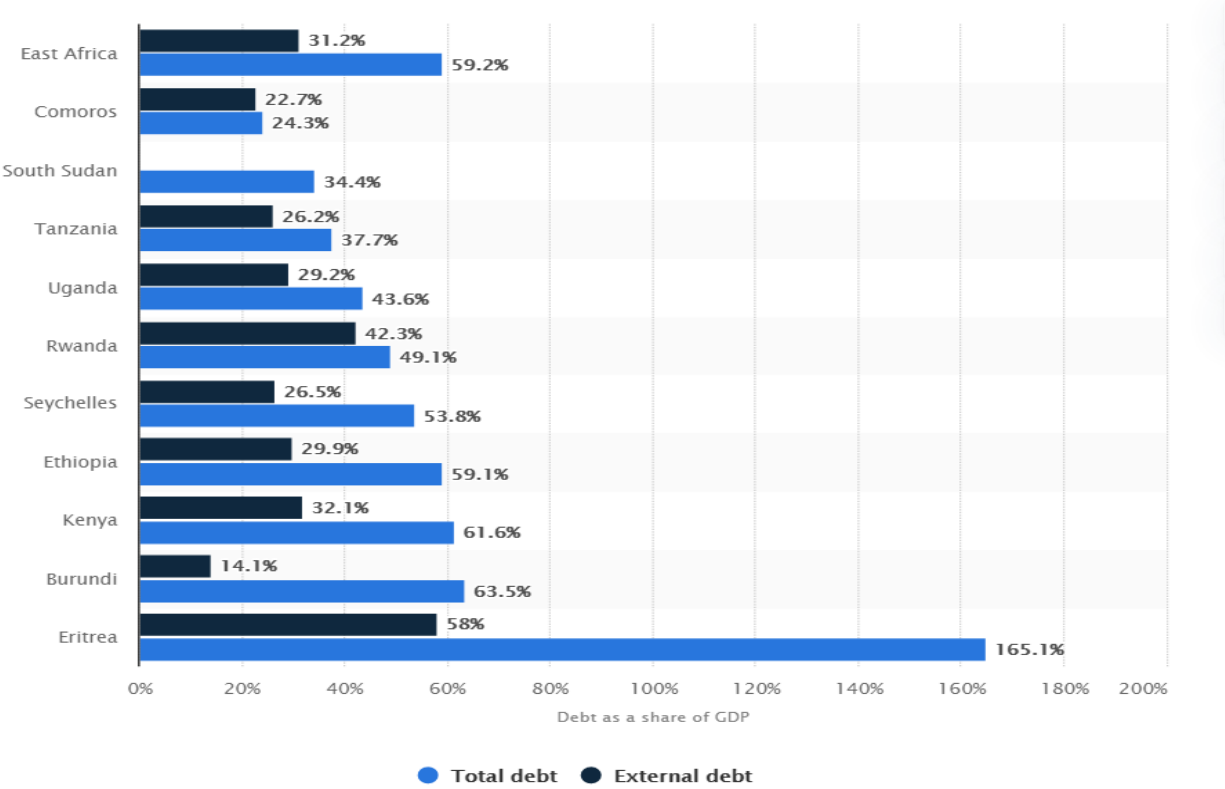
Figure 1.2: Government Debt as Proportion of GDP as of 2019

Source: Faria (2020)

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In comparison to most African countries, Kenya's public debt has been not just persistent but also nearly exponential. Kenya's debt has risen from 'Sh1.89 trillion in 2013' to approximately Sh5.04 trillion in 2018, and is expected to exceed Sh7 trillion in December 2020. (Munda, 2018; Kimathi, 2020; Central Bank, 2021). As a result of this increase, Kenya has committed 'more than half of its tax revenue' to debt repayment, leaving no money for growth (Munda, 2018). Kenya was expected to 'spend sh870.5 billion on debt servicing' in 2018 compared to expected earnings of sh1.76 trillion (Kodongo, 2018). The country's debt-to-GDP ratio rose to 57.1 percent in 2017 from 42.8 percent in 2008 (Central Bank of Kenya, 2018).

1.1.1 Rationale for public debt

Economic growth is among the 17 United Nations (UN) Sustainable Development Goals (SDGs) that must be met by 193 nations by 2030. The goals necessitate countries to engage in critical sectors such as machine learning, technical growth, and human resources as the world economy changes toward the fourth industrial revolution. According to the World Economic Forum, without these vital investments, economic development would be sluggish, and countries would become less competitive as investments were oriented toward traditional industrial methods (2017).

Investing in the vital areas listed above necessitates a large sum of money. As a result, countries that receive fewer investments through domestic or foreign trade may need to rely on public borrowings to finance economic growth. Furthermore, some countries, such as Indonesia and Japan, are periodically hit by a slew of natural disasters, necessitating the establishment of an emergency fund. Even if funds can be raised by domestic and international assistance, they cannot be adequate if the consequences are catastrophic. As a result, taxation is seen as a feasible source of revenue to support emergencies in this case (Ono & Uchida, 2018). Taxation, on the

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other hand, is less popular with policymakers since it has a detrimental impact on economic development (Barro, 1979). As a result, if the country is short on cash, the best practical option for funding government spending and other economic programs is to use public debt. The Ricardian invariance theorem asserts that taxation puts an undue burden on the public by lowering people's purchasing power and raising their cost of living (Barro, 1979).

According to prior studies, depending on the size and goal of debt, public debt can have a good or bad impact on the economy. The debt-to-GDP ratio is widely used to determine how much debt should be lent. On the other side, Reinhart, Reinhart, and Rogoff (2015) proposed that the ratio to not exceed 90% arguing that such a ratio would not affect economic expansion. This ratio is evident in developed, western economies where gdp-to-debt ratio averages 88.2% yet their economies have some of the best living standards in the world (Karadam 2018). The core arguments about GDP-to-Debt ratio is retaining debt level is below a certain threshold facilitates healthy economic development while exceeding the threshold results in slowed growth (Karadam 2018).

1.1.2 Implications of public debt

The severity of Kenya's public debt is compounded by the global pandemic and numerous governments' efforts to use borrowing as the primary method of funding the economy. This has seen the country's debt-to-GDP ratio rise to over 60% as showed in Figure 1.3. Kenya has set out to leverage financing tools such as foreign direct investment and borrowed funds for financing its infrastructure. Beyond financing infrastructural projects, public borrowing in Kenya has also been occasioned by the need to finance budget deficit in the country arising from revenue shortfalls (Tamale & Gathii, 2021). Pertinent amid this debt development is the concern for debt implications on the living standards among the citizenry (Tamale & Gathii, 2021). This concern

is rooted on two issues relating to the government borrowing. First, there has been a gross misapplication of borrowed finances characterized by poor planning and corruption. Second, the borrowing spree in the country has seen debt service obligation continue to rise, reaching 34% of total debt in 2020 as showed in Figure 1.4.
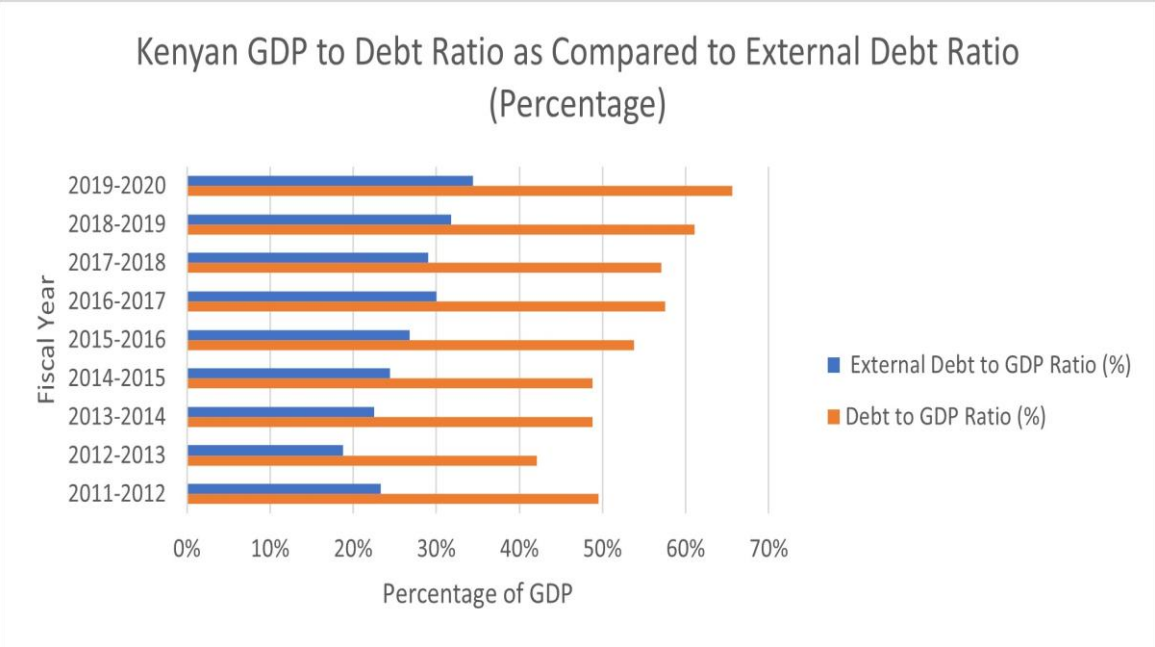
Figure 1.3: Debt-to-GDP ratio for the last ten years

Source: Tamale and Gathii (2021)
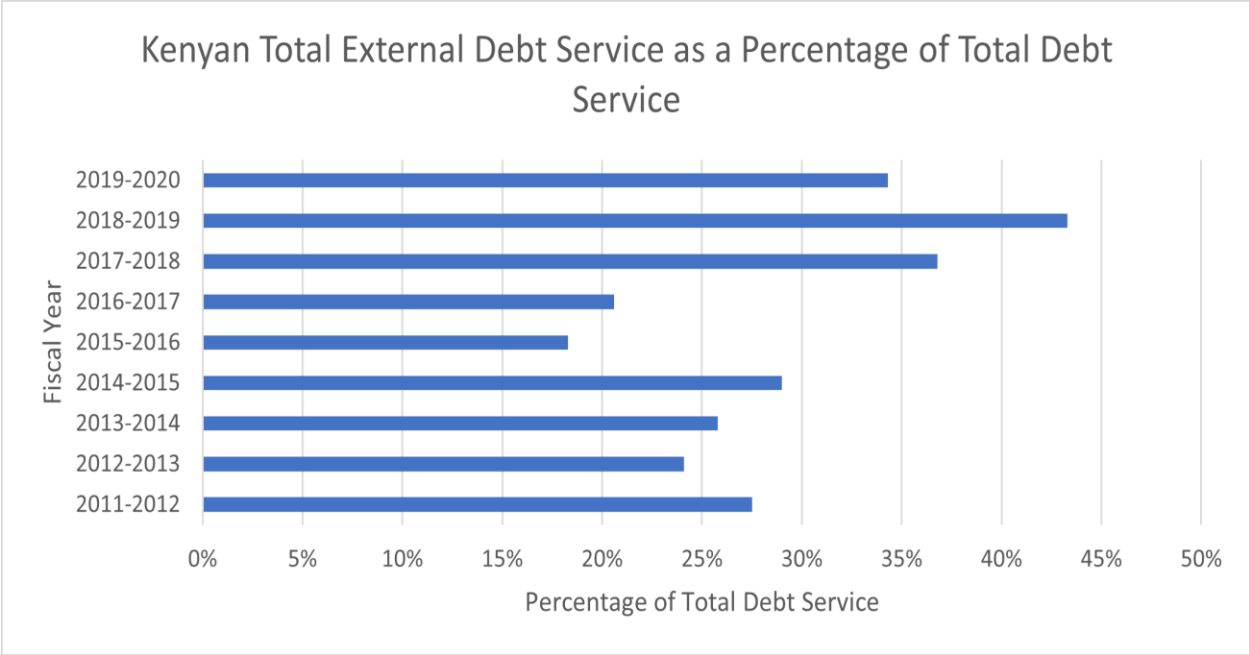
Figure 1.4: Debt-to-GDP ratio for the last ten years

Source: Tamale and Gathii (2021)

Despite Kenya's fast increase in public debt, the trend's influence on macroeconomic stability and development has hardly been examined empirically. Economists are yet to generally agree on whether public debt has a good or negative impact on macroeconomic stability and welfare, a fact that negates use blanket conclusions whenever a country's debt trajectory is on the rise (Rahman et al., 2019; Renjith & Shanmugam, 2018). The basic justification for governmental borrowing, as posited by standard economic models, is to stimulate economic activity in order to improve household welfare. This justification differs when approached from the purview of prominent economic theories namely the neoclassical theory, Ricardian Equivalence, and Keynesian theory that are used when arguing for or against public debt (Lwanga & Mawejje, 2014; Renjith & Shanmugam, 2018).

The Ricardian Equivalence asserts that debt's main purpose is to smooth out revenue shocks, and predicts a neutral connection (Rahman et al., 2019). The Keynesian theory states that public

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debt will increase aggregate demand and fuel economic expansion. The Keynesian approach core principle is that more independent government expenditure, financed by borrowing, will spur economic growth through the multiplier effect (Renjith & Shanmugam, 2015). Debt is negatively associated with economic growth based on the neoclassical theory, since debt generates a fall in government saving or an increase in government dissaving, distorting the natural level of growth. This betterment is coincidental to the 17 goals of the SDGs initiative of the UN. The first four SDGs namely, access to basic human needs, access to food and humanitarian relief, good health and wellbeing, and access to quality education directly constitute economic welfare.

1.1.3 Economic growth and socioeconomic welfare

Kenya has experienced a tremendous growth in its socioeconomic welfare over the last five years specifically expenditure in education and healthcare. For instance, government's expenditure on health and education has also been on the rise as showed in Table 1.1. Recurrent health expenditure has surged from KES 19.5 billion in 2015/16 to KES 50.72 billion in FY 2019/20. Health development expenditure also increased four folds from KES 15.15 billion to KES 65.04 billion in FY 2019/20. Recurrent expenditure in education surged from 298.8 billion in 2015/16 to KES 468.4 billion in 2019/20 while development expenditure in the same sector increased from KES 14.6 billion to KES 28.3 billion in the same period.

Table 1.1: Trends in healthcare and educational expenditure

	Recurrent Expenditure (million)		Development Expenditure (million)	
Fiscal Year	**Health**	**Educational**	**Educational**	**Health**
2015/16	19,504.3	298,768.91	14,608.41	15,150.30
2016/17	29,806.9	302,428.82	23,048.12	26,799.10
2017/18	28,635.3	391,359.77	21,095.18	33,206.00
2018/19	42,472.1	428,200.60	26,879.24	34,211.90
2019/20	50,715.2	468,445.99	28,346.25	65,035.30

Source: KNBS Economic Survey (2020)

Although there have notable changes in educational enrolment since 2015, the change has been minimal as showed in Figure 1.5. Total enrollments in both primary school education increased from 10.09 million in 2015 to 10.54 in 2018 with a slight decline in 2019 based on preliminary data from KNBS. Enrolments in secondary education increased from 2.559 million to 3.26 million up to 2019 as did ECDE enrolments from 3.168 million to 3.391 million in 2018. These statistics suggest an improving welfare situation in the country the cause of which is not exactly defined. Also unclear is whether the changes in socioeconomic welfare in Kenya are proportional to the rapid growth in public debt in the country, both external and domestic debts.
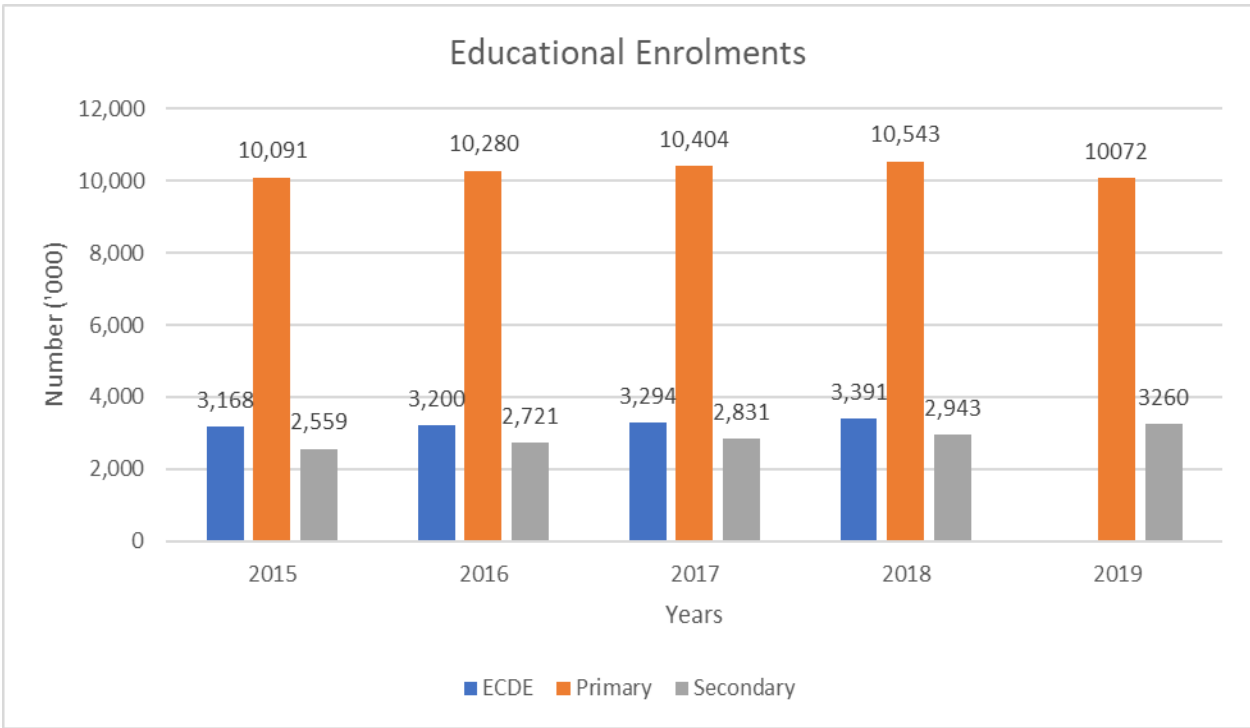
Figure 1.5: Trends in total educational enrolments in Kenya

Source: KNBS Economic Survey (2020)

Economists argue that social welfare should be proportional to a country's level of growth. Thus, sustainable prosperity would be jeopardized if the authorities struggle to provide adequate welfare for the people as the economy grows (Awan, 2015. The link between economic progress

and happiness is long and complicated, especially when it comes to long-term development. Perhaps this is why the World Commission on Environment and Development (WCED) established a link between development and three sustainable indices, decomposed as environment, economics, and social well-being. As a result, the fundamental assumptions behind the idea of economic growth have shifted to sustainable development. This form of development is a process that meets present demands among households without affecting future generations' capacity to achieve their own. The WCED places a strong focus on equity issues, especially the aim of alleviating poverty in communities where most people profit from the opportunities offered by the process of economic development (Neumayer, 2019).

Recent research has compared economic welfare, which is regarded as the ultimate goal of development, to economic growth, which is described as an imperfect proxy for greater overall welfare or as a means to increased economic welfare (Edeme, 2018; Ng & Wills, 2009; Fleurbaey, 2015). The scope and aims of development have increased as a result of this debate, but the important interrelationships between economic growth and welfare remain largely unexplored. Furthermore, the popular desire for immediate punitive action to address the threat of global warming is an unacceptable diversion of resources away from the more serious environmental problems that poor countries face. The resource constraints do not imply growth limits, and the economic damage caused by climate change will be a little part of global output (OECD Council Meeting, 2015). Inadequate access to clean drinking water and sanitation, renewable energy use, carbon dioxide emissions, and natural resource depletion are all indicators that the development-welfare nexus should be emphasized to fulfill the growing requirements of coming generations.

1.2 Problem Statement

Kenya's governmental debt has risen significantly, raising concerns about its long-term viability and impact on the country's residents' socioeconomic well-being. Kenya's debt as a proportion of GDP climbed from 42.8 percent in 2008 to 70 percent in 2020, according to the CBK's data (2021). This ratio is greater than the IMF's recommended threshold of 60%, which has ignited a heated debate on the advantages and disadvantages of continuing to amass debt (Kodongo, 2018). Kenya's debt has expanded faster than its GDP, according to critics of excessive public debt. This trend has undermined the economic benefit that a growing economy should generate (Munda, 2018; Ndii, 2017; Ochieng, 2018).

Notably, few empirical studies have examined the debt's implications on socio-economic welfare in Kenya. Two of the identified papers concerning the implications of public debt in Kenya focused on other macroeconomic variables such as economic growth (Wanjiku, 2018) and macroeconomic stability (Njoroge, 2020). These studies have either found that too much debt only resulted in short-term economic growth while crippling the long-term prospects or that it has destabilized macroeconomic prospects. There is a need to further examine the implications on socioeconomic welfare owing to the direct connection it has on households through expenditure. Household expenditure is expansive, including expenditure on direct consumption, healthcare and education consumption. For logistical and feasibility concerns, the highlighted research problem was examined from the lens of direct consumption expenditure.

1.3 Research Questions

The core research question for this study is "What is the impact of public debt on household consumption expenditure in Kenya?". This question is complemented by the following specific questions.

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    a) What impact does debt volume has on the household consumption expenditure?

    b) What are recommendable policies to control the utility of public debt as a growth tool?

1.4 Research objectives

The overarching goal of this research is to determine the impact of public debt on household consumption expenditure in Kenya. This will be fulfilled through the following research expenditure.

    a) To explore into the impact of public debt on household consumption spending.

    b) To look into recommendable policies to control the utility of public debt as a growth tool.

1.5 Justification of the study

This study was justifiable in three ways. First, it might affect how debt is structured and utilized in Kenya depending on the outcomes of the research. The purpose of debt is to benefit the citizens of a country, either directly or indirectly. There this goal is not achieved, there is a need for policymakers to structure debt to ensure that its benefits taxpayers by improving the quality of their lives. Second, it might be handy in providing evidence-based literature concerning the implications of debt on socio-economic welfare. As previously noted, a substantial amount of extant literature discusses hypotheses regarding the relationship between debt and socioeconomic parameters. This study might help in establishing the relationship for the sake of future studies.

1.6 Organization of the study

This is structured into five distinct chapters. Chapter consists of the introduction and background information relating to this research out of which the underlying problem is explained. Chapter two consists of a review of the existing literature concerning public debt and socioeconomic welfare and further highlight of gaps in knowledge. Chapter three has the methodological

framework that to be used to actualize this study. Chapter four contains the findings of this study in line with the highlighted research objectives. Chapter five consists of the conclusions made concerning the research objectives in addition to arising recommendations and direction for further study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The current chapter includes a summary of the published literature on the study's subject. In addition to the introduction, the chapter is divided into three subsections to improve the flow of ideas and the articulation of the literature gap. Section 2.2 discusses the rationale for public borrowing. Section 2.3 includes a review of the empirical literature with regards to the implications of public debt on economic wellbeing and development, while Section 2.4 discusses the hypotheses relevant to the research subject.

2.2 Theoretical literature

The theoretical literature for this study is anchored on several theories namely the Keynesian theory, debt overhang hypothesis, and Ricardian equivalence.

2.2.1 Debt overhang hypothesis

According to this hypothesis, the stock and operation of public debt influence growth by discouraging private investment or altering the composition of government expenditure. Increased foreign interest payments worsens a nation's fiscal balance, which then reduces public savings unless private savings rise to compensate. As a consequence, interest rates could increase or the quantity of credit available for private investment could be reduced, so impeding economic growth. Debt service reduces the availability of public funds for development and human capital investment, which might inhibit economic expansion (Clements et al., 2005). In addition, the theory contends that government debt can have a nonlinear effect on economic growth, either through capital accumulation or productivity gains. In the future, a nation's debt will exceed its ability to repay, and the anticipated debt servicing costs will deter new domestic

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and foreign investment (Krugman, 1988). Potential investors will be apprehensive that the government will raise taxes to finance the national debt as the economy grows. Consequently, they will be less willing to commit present capital expenditures to optimize future production (Krugman, 1988).

2.2.2 Ricardian Equivalence Theory

Public debt has no relationship with economic development, according to Ricardian equivalence theory (RET) (Lwanga & Mawejje, 2014). According to this idea, public debt is irrelevant because it only serves to balance out an economy's spending or revenue shocks (Renjith & Shanmugam, 2018). Raising current government borrowing means greater future taxes, which have the same present value as the debt. The government's "inter-temporal expenditure constraint and the permanent income hypothesis" are the foundations of Ricardian equivalence theory (Renjith & Shanmugam, 2018, p. 174). This theory's key principle is that it makes no difference whether government costs are covered by debt or taxes. According to Karazijiene (2015), if the government, for example, decreased taxes by a particular amount while increased borrowing by an equal amount, the expenditure would not change. The Ricardian equivalence principle states that the link between the budget shortfall and macroeconomic factors such as growth in GDP is agnostic as Kelikume (2016) concurred.

2.2.3 Keynesian Theory

The economy, according to this view, contains both unemployed people and insufficient money (Lwanga & Mawejje, 2014). Deficit funding rises government expenditure, which increases aggregate demand and the utilization of superfluous capital, resulting in increased national output (Hussain & Haque, 2017). The accumulation of debt, according to Renjith and Shanmugam (2018), drives production growth through the multiplier effect. Debt, according to

the authors, is a transfer of capital from taxpayers to bondholders. Keynesian theory holds that public debt has no detrimental impact on the economic growth and, in some situations, can even help to reverse economic turmoil (Eze & Ogiji, 2016).

2.3 Empirical literature

The effects of public debt have been notably studied in the recent years among economists. Some scholars have set out to examine how public debt affects economic growth while others have set out to explore the implications on economic development. Amid the research, scarce scholarly work has been published concerning the effects on social economic welfare. This review strives to explore current direction in the extant literature to explicate the gap that this study seeks to fill.

Egbetunde (2012) explored the causal relationship between economic development and government debt trend in Nigeria using time series data from 1970 to 2010. The author analyzed the study data using the Granger Causality technique, a Vector Autoregressive Model (VAR), and a co-integration test. The author discovered that public debt and economic growth have a long-term relationship, and that they are positively correlated if the government is transparent with the loan and uses it to build the economy rather than for its personal benefit. The paper provides a methodology for assessing public debt's impact, despite the author's emphasis on macroeconomic indicators rather than socioeconomic ones.

Akhter and Hassan (2012) examined the effect of internal and external debt on economic growth in Bangladesh. The purpose of the study was to evaluate how Bangladesh's public debt burden affects the nation's economic growth. The authors employed the augmented Dickey-Fuller test, the Johansen co-integration test, the error collection model (ECM), and the vector error collection model to evaluate time series from 1980 to 2012. (VECM). There is no convincing statistical evidence that external debt has a negative impact on GDP growth in Bangladesh, and

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there is a substantial positive relationship between investment and total public debt, as well as between government buffers and total public debt. The findings revealed that external borrowing has more impact on the country's economic development compared to domestic debt. Socioeconomic performance is arguably part of economic development in that it infers the quality of life of a society. Despite that, the central point of this study was on comparing effects of external and domestic debt as opposed to measuring the overarching effect of borrowing. Moreover, it did not measure the specific variables that relate to socio economics such as healthcare and education expenditure.

Boris (2014) analyzed the long-run economic progress and the connection between debt, investments, and economic growth in a European context to study the connection between external debt and economic growth. The research purposed to test the relationships among economic growth, public debt and investments and determine their direction of causality. Panel, time series data for over 30 years consisting of 12 European countries from 1980 to 2012 was analyzed. The data was analyzed using fixed effects (LSDV) out of which an inverse relationship between investments and public debt were observed. In Italy and Portugal, a pattern of decreasing investments was noted, an indication that their economic development may be hindered in the future. This study majored on the effects of public debt on investment growth – a macroeconomic variable -, with a limited focus on quality of life that constitutes economic development.

Njiru (2016) analyzed the effect of public debt on economic growth in Kenya. The study was conducted using time series data from 1980 to 2013. The research focused not only on external debt and domestic debt but also on private investments into the country. Time-series secondary data was used and analyzed using public debt and growth models. The study discovered that

increased household debt levels pushed out private investment by raising borrowing costs and causing a lag in private investment. The author went on to say that a higher level of external debt resulted in a debt burden, which had a negative impact on GDP. This study is one of the few that have been published in Kenya to examine the effects of public debt. However, it fell short on examining the effect of public debt beyond the macroeconomic variables used in the research.

In a collection of industrialized and developing countries, Alhazarani (2018) looked at the impact of public debt on a variety of macroeconomic and welfare metrics. The study looked at how government debt affects GDP per capita, domestic, and international investment, and HDI in both G7 and ASEAN countries. The author utilized secondary data between 1995 and 2015. The data was analyzed using the panel data techniques to determine the effect of government debt on economic and wellbeing indicators in the Group of Seven Economies (G7) and Association of Southeast Asian Nations (ASEAN). The Hausman test was used to discover the best method for dealing with unanticipated effects. This study stuck to the trend of much of the published literature concerning the effects of public debt. Much of the attention in the study was paid to the effect on GDP and investments, both of which cannot be considered socioeconomic metrics. HDI was the only socioeconomic wellbeing metric measured in the research and whose outcomes from the analysis were not clear.

Muinga (2018) looked into the connection between external public indebtedness and the economic development in Kenya. Time series data from 1970 to 2010 was employed in the research. The data was analyzed using Ordinary Least Square (OLS) out of which an inverse relationship between economic growth and public external debt was obtained. It revealed that as public debt grows the economic performance deteriorates. The author noted that the effects of external debt were negative in Kenya mainly because the funds were not always applied to

productive sectors. Although the study aimed to study economic development, which infers quality of life (welfare), the analyzed variables leaned towards economic growth.

Ssempala et al. (2019) evaluated the economic impact of Uganda's government debt. The research made use of secondary data from 1980 to 2016. The ARDL model was utilized to examine the data in this study. In the short run, the public debt is detrimental to Uganda's economic growth, while in the long run, it has both beneficial and bad effects. The author continued by stating that total debt service/exports have a destabilizing effect, but gross debt as a proportion of GDP has a stabilizing effect. In addition to measuring the effect on macroeconomic variables, the study presents a framework for separating the short-run and long-run effects of public debt.

Ighodalo et al. (2020) looked at the dynamic relationships between economic growth and external debt in 43 African nations. The study utilized time series data from 2001 to 2018, in addition to secondary data from the International Monetary Fund's World Economic Outlook database (IMF) and the World Bank's World Development Indicators (WDI). From 2001 to 2018, the dynamic links between external debt and economic growth in 43 African countries were examined using the Johansen Co-integration tests and the Generalized Method of Moments (GMM) methodology. The study concluded that public foreign debt has a negative effect on Africa's economic growth. However, the study found that the effect of external debt on economic growth varies over time, indicating that external debt is not always a poor policy instrument for economic development, particularly when used well to support economic activities that contribute to growth.

2.4 Overview of Literature Review

The reviewed literature demonstrated a protracted trend among economics to overtly focus their debt criticism on economic growth only. This trend ignores the idea that governments borrow money to finance their expenditure, which directly expands economic growth from that expenditure. That is, while metrics such as GDP might surge in a post-borrowing scenario, it does not signify the goodness of the prevailing debt. As such, measuring the effect of public debt based on the day-to-day living of taxpayers is a better way of discerning the vitality (or lack of it) of public debt. This study seeks to perform such a measurement by examining the impact of external debt on household consumption expenditure in Kenya employing time-series data.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter covers the research techniques used to carry out this study. It includes the research design, model specification, variable description, data collection, and data analysis techniques.

3.2 Research Design

This study was actualized using an explanatory (causal) research design. This design is utilized in scholarly research to examine the cause-effect relationships between dependent and independent variables (Creswell, 2013). This design is suitable for research seeking to examine the effect of a specific phenomenon on another. Explanatory design is suitable for this research for two reasons. First, the study seeks to examine the effect of one parameter (public debt) on another parameter (household welfare), an aim that suits this research design. Second, explanatory design is best suited in secondary studies in that it examines how changes in a phenomenon affect an existing norm or a process (Poyhart & Vandenberg, 2010). This study utilized data for selected variables from 1980 through 2019, which was collected from secondary sources. There is a notable use of time series data among the studies reviewed in chapter two, a trend that informed this decision. Moreover, this research design had been utilized in related studies such as Ngugi (2016) making it a suitable design choice.

3.3 Conceptual Framework

The methodological direction for this study is conceptually derived from the reviewed theories and the empirical literature. Three approaches to the underlying research problem can be derived from the three theories. One of the perspectives is that Kenya has borrowed heavily over the years, creating a debt burden for itself, which has stifled its ability to provide services to its

people. The effect of this burden is poor quality of life for the people because resources and government revenue are spent on interest payments other than in service delivery. The second perspective is that government borrowing has not affected the way of life of the people, both in quality and cost terms because borrowing has been used to smooth out revenue and spending shocks. That is, debt is spent on areas that do not affect the people directly, and the extrapolated implications of that use have little to no effect on the cost and standard of life of the people. The third perspective is that public debt has improved the quality of lives of the people of Kenya by boosting aggregate demand and national productivity in line with Keynesian theory.

None of these theories makes explicit claims concerning the effect of debt to the socioeconomic welfare of a state. If anything, theories demonstrates that the effects of public debt can vary, and any of the propositions is a possibility. The theories are also flowed in one critical area; they are focused on the manner in which government use borrowed finances. This perspective inherently focuses on debt as an object, quantified and measured by its amount. However, the theories make little or minimal mention about the terms and policies accompanying debt, and their corresponding effects, which can be far reaching. For instance, debt requires regular payments through predetermined interest rates, paid for from government coffers (Setterfield & Kim, 2016). The regular payment that a government sets aside to honor its debt obligations is referred to as debt servicing (Setterfield & Kim, 2016). Notably, this amount is raised from taxes as argued in Jacquemont (2007), which means that debt can influence the revenue a government raises, and the means it raises that amount such as taxation.

Jacquemont (2007) argues that public debt results in an array of socio-economic effects including rising poverty, increase in inequality, and poor living standards. Arguably, cost of living and poverty are concepts that are directly influenced by the amount of money individuals

have at their disposal for their consumption expenditure (Albouy et al., 2016; Rashid et al., 2020). Another highlighted parameter is the exchange rate owing to the currency implications of debt servicing. To that end, several variables namely debt servicing, education expenditure, healthcare expenditure, and household consumption expenditure were used in this study as illustrated in the conceptual framework in Figure 6.

Figure 6: Conceptual Framework

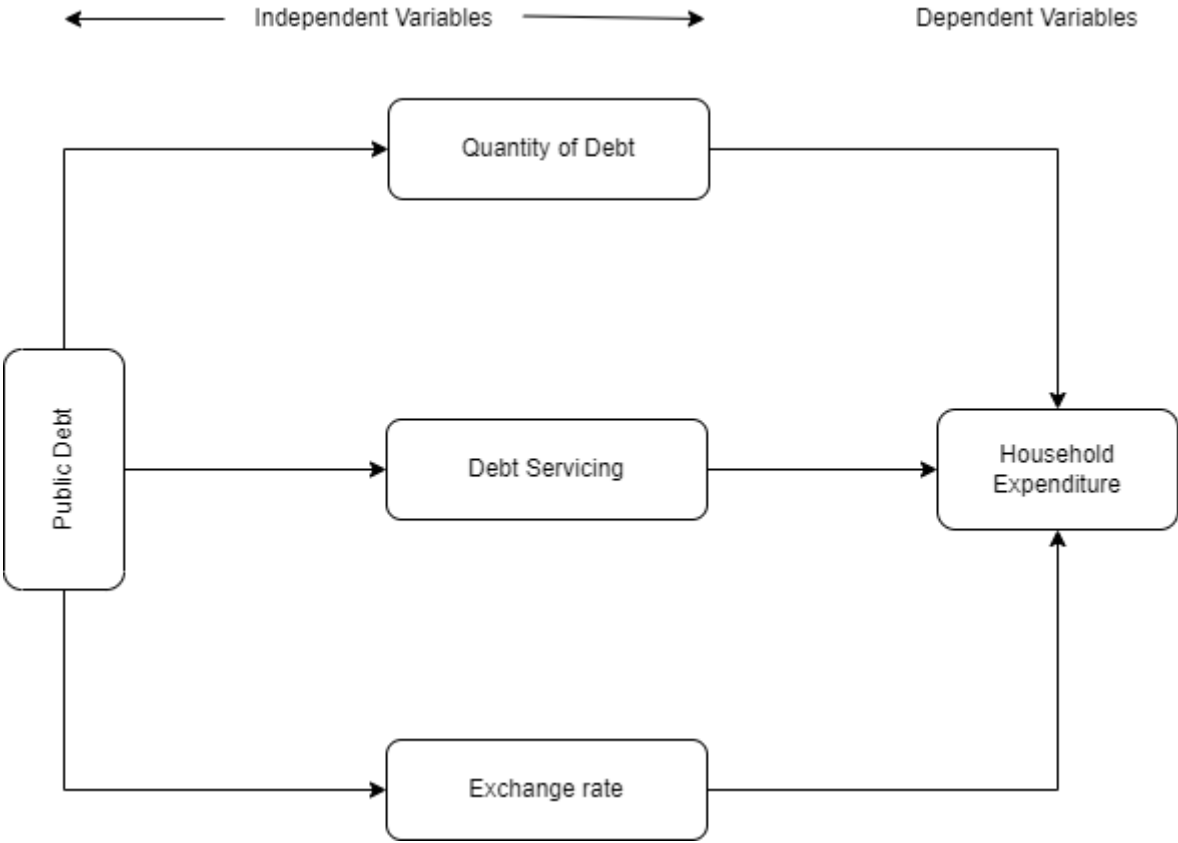**Source:** Author

Figure 6 visualizes a relationship between public debt and the selected welfare variables. The suggestion is that public debt effects on socioeconomic welfare do not occur in isolation but rather are moderated by exchange rate, and debt servicing. These made up the independent variables of the study, which interact to influence household expenditure as the dependent variable.

3.4 Model specification

The highlighted model is derived from the conceptual framework discussed in Figure 6. It was hypothesised that the listed variables corresponded to a linear mathematical model in the format shown in Equation 1. Although the reviewed literature does not explicitly address the underlying research problem, it provides ideas into the approaches the authors used to study related objectives. There is a notable reliance on OLS regression modeling as the authors attempted to examine the effect of one variable on another.

$$Y = \beta + \beta_0 X + \varepsilon \ldots\ldots\ldots\ldots\ldots\ldots.. 1$$

Equation one represents the foundational concept of linear relationships. The equation implies that X and Y are linearly related subject to the β_0 coefficient of X and along the β intercept. In the multivariate scenario like this study, equation 1 can be expanded as showed in equation 2

$$Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ldots\ldots\ldots 2$$

In equation 2, Y represents household consumption expenditure as the proxy for socioeconomic welfare. On other hand, X_1 denotes public debt, X_2 denotes debt servicing, while X_3 denotes exchange rate as the independent variables. Symbols, β, β_n, and ε represent the model intercept, respective coefficients for the independent variables and the error term respectively. Random deviations, miscalculations, or the impact of factors outside the parameters of this research are represented in the model by the model intercept. The highlighted variables measure different economic aspects and in different units as showed in Table 3.1

Table 3.2: Measurement of variables

Variable	Meaning	Unit of Measure	Predicted Sign
Public debt	The amount of money or monetary resources a government borrows	Public debt per capita (in Kenyan shillings)	- Bouchat et al., 2021

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Debt servicing	The amount used in payment for loans taken	Amount of money paid to creditors (in Kenyan shillings)	- Bouchat et al., 2021
Household consumption expenditure	The average amount spent by a household on consumption	Consumption expenditure per capita (in Kenyan shillings)	N/A
Exchange rate	The value for which Kenya's currency is exchange with other currencies	Value of exchange (in Kenyan shillings)	- Mansell & Openshaw, 2010

Source: Author (2021)

It is expected that public debt has a negative effect on social welfare because of the terms associated with debt. Prior to providing a debt to Ecuador in 2004, the IMF demanded of the government to adopt strict structural adjustments that led to reduced expenditure on core government functions such as education (Bouchat et al., 2021). Such an effect arising from public borrowing can be detrimental to the quality of lives of taxpayers as a ripple effect of reduced expenditure on core functions. This view underscores the idea that government expenditure on core services do not exist in isolation. Rather, the effect felt by taxpayers are influenced by other factors such as tax increments and debt servicing expense. A rise in tax inflicts direct pain on taxpayers while the income raised in used to service debt as opposed to funding government services (Mansell & Openshaw, 2010). This narrative is evidence to the potential negative impacts of public debt on people's way of life.

3.5 Data Sources

This study was actualized using time series secondary data. The study's data stemmed from a number of secondary sources, including the Central Bank of Kenya, economic statistics from the Kenya National Bureau of Statistics (KNBS), World Bank publications, IMF statistical bulletins, and UNDP data portals. Data about household welfare -calculated by average food spending- was derived from KNBS economic data, World Bank, and IMF. Data about public debt was be

collected from the Central Bank of Kenya, IMF, and World Bank. Data about educational and health expenditure was collected from the UNDP statistical portal and World Bank databases. Data about debt servicing, exchange rate and taxation were sourced from World Bank data portal.

3.6 Data Analysis

The collected data was cleaned to facilitate credibility and reliability before inferential and descriptive analysis. The data was then evaluated using the EViews analysis software to answer the underlying research aim, which was to investigate the cause-effect relationship between public debt and household welfare. Several tests namely descriptive analysis, stationarity, regression, correlation, and diagnostic test were carried out not only to establish this association.

3.6.1 Descriptive analysis

The descriptive analysis involved an array of measures including central tendency, dispersion, and distribution. The purpose of this test was to give an overview of the data based on tests namely mean, median, skewness, kurtosis, and standard deviation.

3.6.2 Stationery test

$$Y = \beta_\circ + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \dots\dots\dots\dots\dots\dots.. 3$$

Where -

Y = Household Consumption Expenditure
X_1 = Public debt
X_2 = Debt servicing
X_3 = Exchange rate
$\beta_\circ, \dots, \beta_3$: Regression Coefficients
ε : Error term

This study followed a statistical model of the OLS nature to process time-series data for each of the highlighted metrics. There was a need to ensure that the sampled dataset was stationary

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(Hadri & Kurozumi, 2012). Non-stationary time series data produces unreliable results whose eventual models can be misinforming. The unit root was tested using the graphical test and the Augmented Dickey-Fuller (ADF) in line with the model in equation 4.

$$\Delta y_t = \alpha + \delta T + \rho y_{t-1} + \Sigma_{i=1}^{n} \beta_i \Delta y_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots 4$$

Where:

Δ = The change operator

y_t = Variables

T = Time trend

$\alpha, \delta, and\ \beta_i$ = Parameters

ε_t = The error terms

3.5.3 Correlation analysis

Person's correlation was computed to determine the degree and direction of the association between the dependent and independent variables. This type of correlation was preferred because of its time series and continuous nature (Cohen, West & Aiken, 2014).

3.6.4 Regression analysis

This test helped to derive cause-effect relationship between public debt and socioeconomic welfare in line with Equation 2. This paper involved more than one independent variable considering the nature of the underlying research problem. Each of the variables other than public debt formed the dependent variable for the research. To that end, multivariate multiple regression was done to allow for the study to involve more than one outcome variable. The t-test and (p-value) statistics were utilized to determine statistical significance (Rakutti & Mahoney, 2017).

3.6.5 Diagnostic test

The observation of OLS assumptions namely autocorrelation, multicollinearity, and homoscedasticity were examined through diagnostic tests. This test was performed to ensure the model did not result in spurious outcomes (Raskutti & Mahoney, 2017).

CHAPTER FOUR

FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the observations made concerning that aim. Contained in the chapter includes the descriptive statistics, unit root test, correlation analysis, and regression analysis. The chapter also contains hypotheses testing, diagnostic testing, and discussion of the results.

4.2 Descriptive statistics

Descriptive analysis was conducted to provide a statistical overview of the gathered data. The variables for this research included public debt, exchange rate, household consumption expenditure, and total debt service. Data for these variables was selected in time series approach for 50 years since 1970 through 2019. The descriptive analysis entailed three categories of measures namely central tendency, dispersion, and distribution. Central tendency for the dataset was measured through mean and median as showed in Table 4.1. Dispersion of the dataset was measured through standard deviation, minimum, range, and maximum as shown in Table 4.1.

Table 4.3: Descriptive Statistics (Central Tendency and Dispersion)

	Total Public Debt (KES Million)	Exchange Rate (USD value in KES)	Household Consumption Expenditure (per capita) (KES)	Total debt service (KES Million)
Mean	881729.6	47.9	42849.3	44152.8
Standard Error	198493.5	4.9	5086.9	10844.5
Median	384433.7	56.6	41059.0	29345.9
Standard Deviation	1403560.7	34.7	35970.0	76682.0
Range	6045515.5	96.4	119341.0	457943.7
Minimum	3411.0	7.0	3835.9	345.2
Maximum	6048926.5	103.4	123176.9	458288.8
Sum	44086482.1	2395.1	2142465.7	2207639.1
Count	50	50	50	50

Source Data: Author's Data (2022)

Kenya's average cumulative debt was KES 881.7 billion for the 50 years with a summative debt of 44 trillion across the period. The minimum value of this debt was KES 3.4 billion in 1970, climaxing at KES 6 trillion in 2019. The average exchange rate across the 50 years was KES 47.9 for every United States Dollar (USD), with a median of KES 56.6, maximum of KES 103.4, and minimum of KES 7.0. The country's average repayment has been KES 44.2 billion a year, with least repayment being 345.2 million and KES 458.3 billion as the highest yearly payment. The average household consumption expenditure in the 50 years was KES 42,849, with the highest expenditure being KES 123,176 and lowest at KES 3835.

While informative, measures of central tendency can be misguiding in that they do not provide an overview of the changes in a variable across a period (Mishra et al., 2019). This shortcoming makes it imperative to measure dispersion to account for arithmetic differences between data points across time (Mishra et al., 2019). The standard deviation for public debt was KES 1.4 trillion, KES 34.7 for the exchange rate, KES 35,970 for household consumption, and KES 76.68 billion for debt repayment expenditure as shown in Table 4.1.

The study also examined the distribution of the gathered data as recommended by Mishra et al. (2019). This would help determine whether the data were normally distributed, which would then influence the method used in inferential analysis. According to Grech and Calleja (2018), analysing data through parametric methods necessitates normal distribution for a set of data. A dataset is normally distributed when its mean occurs rather frequently than either of its tails (Grech & Calleja, 2018). The study used kurtosis and skewness parameters to measure the distribution of the gathered data as shown in Table 4.2. The decision criterion when using skewness is that a dataset is symmetric (normally distributed) when the absolute value of its skewness is between 0 and 0.5. On the other hand, the dataset is said to be skewed or slightly

skewed when its parameter edges towards 1 (Orcan, 2020). A dataset is said to be normally distributed when its kurtosis parameter is either zero, or close to zero. The dataset is said to be pointy (not normally distributed) when its kurtosis is either three or close (Orcan, 2020).

Table 4.4: Skewness and Kurtosis Statistics

	Total Public Debt	Exchange Rate	Household Consumption Expenditure	Debt service
Kurtosis	0.2	-1.6	-0.6	0.8
Skewness	0.3	0.1	0.4	0.3
Count	50	50	50	50

Source Data: Author's Data (2022)

The skewness for public debt was 0.3, 0.1 for exchange rate, 0.4 for household consumption expenditure, and 0.3 for total debt service. The kurtosis parameter for total public debt was 0.2, 0.6 for household consumption expenditure, and 0.8 for total debt service. However, exchange rate had a relatively pointy kurtosis. Nonetheless, the analysed dataset was considered to have a normal distribution based on the highlighted decision criteria.

4.3 Effect of public debt on household expenditure

4.3.1 Test for stationarity

Stationarity test is important prior to performing regression assessment. This test checks whether core statistical parameters of a dataset such as variance and measures of central tendency are constant across a period (Grech & Calleja, 2018) which guides a statistician to eliminate seasonal variations in a set of data. The unit root test was necessitated by the time series nature of the collected data to ensure that the regression results were not spurious. Two methods namely graphical method and augmented dicky fuller (ADF) test were used to examine the stationary

nature of the gathered data as showed in Figure 4.1 and Table 4.3 respectively. The researcher computed the rate of change of each of the parameters over the 50 years as opposed to measuring each parameter by its stated metric. This decision was informed by the fact that raw metrics are highly susceptible to seasonal and periodic rise and falls, a trend that contravenes the constancy assessed in stationarity (Hadri & Kurozumi, 2012).
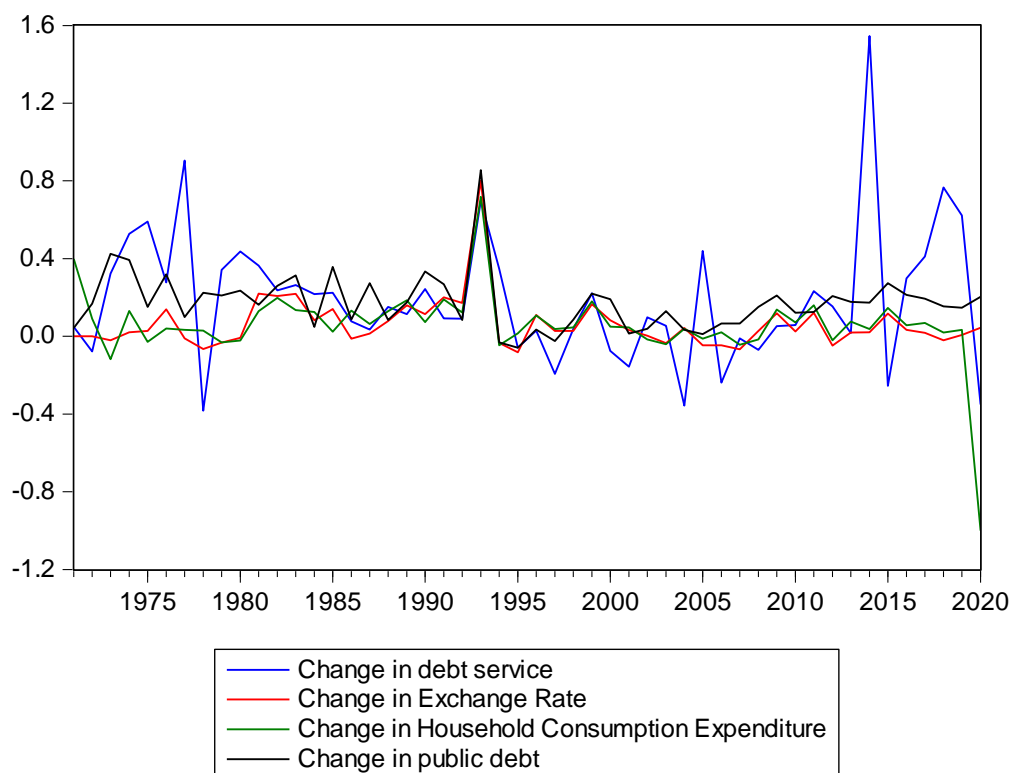
Figure 4.7: Graphical Test for Stationarity

Source Data: Author's Data (2022)

There was no precisely defined seasonality in the dataset based on Figure 4.1. While there were notable cycles in the data, the researcher considered them unpredictable, and non-seasonable in nature. To that effect, the series was considered stationary for all research variables based on visual assessment. A unit root test was conducted using the Augmented Dicky-Fuller test for statistical confirmation of the stationarity. The ADF was computed using the Akaike Info

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Criterion as the lag length. The underlying null hypothesis for this test was that a unit root was present, with a 95% confidence level. The outcomes of the unit root at level and first difference is shown in Table 4.3.

Table 4.5: ADF Test for Stationarity

	At Level		**At First Difference**		
Variable	**t-Statistic**	**Prob**	**t-Statistic**	**Prob**	**Order of integration**
Household Consumption	-4.191	0.0017	-8.638	0.0000	I (0)
Public Debt	-7.002	0.0000	-9.149	0.0000	I (0)
Debt Service	-7.354	0.0000	-6.484	0.0000	I (0)
Exchange Rate	-5.740	0.0000	-7.570	0.0000	I (0)

Source Data: Author's Data (2022)

The decision criterion for testing the hypothesis is that, if the computed probability is less than the alpha level, the null hypothesis is rejected (Grech & Calleja, 2018). To that effect, the critical probability was less than the alpha level for all the variables, both at level and at first difference. As such, the null hypothesis that a unit root was present was rejected for the alternative. In conclusion, the series was stationary at level for the four variables.

4.3.2 Correlation analysis

Correlation analysis was computed to assess the directional association between the dependent and independent variables. This analysis was conducted to determine whether household consumption expenditure had a positive or negative association with each of the predictor variables. The study utilized the Pearson's method for computing correlation based on the parametric nature of the gathered data as tested in Table 4.2. The outcomes of the correlation analysis are demonstrated in Table 4.4.

Table 4.6: Correlation analysis results

Correlations

	Change in Household Consumption Expenditure	Change in public debt	Change in debt service	Change in Exchange Rate
Household Consumption Expenditure	1			
Public Debt	.598[*]	1		
Debt Service	-.620	.271	1	
Exchange Rate	.536[**]	.692[**]	0	1

Source Data: Author's Data (2022)

The decision criterion for correlation analysis is such that, a coefficient of 1 infers perfect correlation. However, a coefficient between 1 and 0.5 denotes strong correlation, between 0.5 and 0.3 denotes moderate correlation, while a coefficient below 0.3 denotes weak association between two variables (Grech & Calleja, 2018). The arithmetic sign appended to the coefficient denotes the direction of the association, whether it is negative or positive (Kafle, 2019). Based on that criterion, the analysis showed a strong correlation between household consumption expenditure and public debt (r=.598), debt service (r=-.620), and exchange rate (r=.536). This would mean that an increase in public debt and exchange rate can result in higher household consumption while an increase debt service burden lowers household spending. The correlation for public debt and exchange rate were statistically significant at the 5% level.

4.3.3 Regression analysis

The need for regression analysis was to examine the cause-effect association between the dependent and independent variables of this research. Household consumption expenditure was regressed as the outcome variable while public debt, exchange rate, and dept service were the predictor variables. This procedure followed the Ordinary Least Squares (OLS) approach owing to its multivariate nature. OLS regression necessitates certain assumptions including zero correlation of the error terms, linear association between the dependent and independent

variables, normal distribution, and homoscedasticity (Kafle, 2019). The model summary of the regression analysis is presented in Table 4.5.

Table 4.7: Coefficient of Determination Statistics

Model Summary[b]							
			Change Statistics				
R	R Square	Adjusted R Square	R Square Change	F Change	df1	df2	Sig. F Change
.568[a]	.323	.278	.323	7.303	3	46	.000

Source Data: Author's Data (2022)

The weight of significance of the predictor variables on the outcome variable was determined through the coefficient of determination. This coefficient elucidates the extent to which the predictor variables can explain changes in the outcome variable (Kafle, 2019). The analysis showed that changes in public debt, debt service, and exchange rate could explain about 28 percent of the changes in household consumption expenditure over the 50 years. Adjusting the R-squared makes the coefficient more stable and less volatile to the changes in the predictor variables (Kafle, 2019). This benefit explains the use of Adjusted R-squared for this interpretation.

The study used the coefficients to guide the conclusion concerning the effect of public debt on socio-economic welfare because it is the decision criterion for regression-based models. Regression coefficients demonstrate the magnitude of the effect that each predictor variable has on the outcome variable (Kafle, 2019). The subsequent interpretation of this magnitude explains how a unit change in the predictor variable causes a change in the outcome variable and the direction of that change. The computed coefficients are demonstrated in Table 4.6.

The study had three hypotheses to guide the interpretation of the outcomes of the regression analysis. The null hypotheses were as follows.

H_1. There is no significant effect of public debt on household consumption expenditure.

H_2. There is no significant effect of debt service on household consumption expenditure.

H_3. There is no significant effect of exchange rate on household consumption expenditure.

The decision criterion for hypothesis testing is such that, where the probability that an assumption can occur is low, the underlying assumption is incorrect. Otherwise, the assumption is assumed to be correct (Kafle, 2019; Pandey, 2020). The basis for rejecting or not rejecting a null hypothesis was on the p-value associated with the key variable.

Table 4.8: Regression analysis coefficients

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5.250	.039		.644	.023
Change in public debt	.253	.230	-.189	-1.099	.278
Change in debt service	-.195	.072	.166	1.313	.006
Change in Exchange Rate	.095	.249	.639	3.802	.000
a. Dependent Variable: Change in Household Consumption Expenditure					

Source Data: Author's Data (2022)

The regression analysis demonstrated that the predictor variables had rather small effects on the outcome variable. The results showed that a unit (shilling) increase in borrowing increases consumer spending by 0.253 units, albeit not statistically significant at 5% level. To that effect, the null hypothesis that there is no significant effect of public debt on household consumption expenditure was not rejected. A unit increase in debt servicing burden decreases consumer spending by 0.195 units, which was statistically significant at 1% level ($p < .01$). To that effect,

the null hypothesis that there is no significant effect of debt servicing on household consumption expenditure was rejected. A unit increase in the exchange rate increases consumer spending by 0.095 units. This observation was statistically significant at 1% (p<.001). As such, the null hypothesis that there is no significant effect of exchange rate on household consumption expenditure was rejected. The intercept showed that there are other factors that could explain up to 5.25 units increase in consumer spending based on the regressed model.

As previously mentioned, this study was guided by a regression model showed in Equation 2.

$$Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 \ \text{....2}$$

Based on the above interpretation, equation 5 was derived as follows.

$$Y = 5.25 + 0.253 X_1 - 0.195 X_2 + 0.095 X_3 \ \text{....5}$$

An analysis of variance (ANOVA) was performed as a basis for examining the statistical significance of the regression model. The ANOVA test necessitates the assumptions that error terms sum up to zero, are normally distributed, and have equal variances (Pandey, 2020). The null hypothesis for this test was that the regression model was not statistically significant. The outcomes of the test are showed in Table 4.7.

Table 4.9: Analysis of variance

Model	Sum of Squares	df	Mean Square	F	Sig.
ANOVA[a]					
Regression	.619	3	.206	7.303	.000[b]
Residual	1.299	46	.028		
Total	1.918	49			

Source Data: Author's Data (2022)

The decision criterion for this test was based on the F-statistic. The rule of thumb is such that the null hypothesis is rejected in the event of an F-statistic higher than 1, and whose significance is less than the critical value of 5%. To the effect of that criterion, the null hypothesis that the regression model was not statistically significant was rejected for the alternative.

The outcomes of this study were partly consistent and partly inconsistent with previously published literature concerning effects of government borrowing on socioeconomic welfare from the lens of household consumption. For instance, Berben and Brosens (2017) found that government debt and private consumption were inversely related, but only in high debt nations. In low debt nations, private consumption was insensitive to public borrowing. The difference with this study is that Kenya falls under the category of high debt countries having surpassed the 60% debt threshold by 10%. Despite that, this study found a positive relation where an increase in public debt brings with it an increase in household consumption, an observation that is inconsistent with Berben and Brosens (2017).

The overarching expectation was that excess and consistent public borrowing in Kenya has led to a rise in household spending. This expectation was rooted in the classical Ricardian equivalence hypothesis, which argues that governments borrow to stabilize economies (Kusairi et al., 2019). This stabilization could be actualized by reducing unemployment or increasing national output. Both goals influence macroeconomic variables such as taxes, increasing disposable income, and aggregate demand (Kusairi et al., 2019). The effect of this stabilization is an increase in private consumption, which is why the hypothesis has been a basis for public borrowing.

However, the findings were consistent with the modern version of the hypothesis, which suggests that increases in government spending arising from debt financing does not necessarily

affect household consumption (as cited in Kusairi et al., 2019). The hypothesis argues that consumers respond rationally to excess borrowing by saving more as they speculate more taxes for repaying the debt. This consistency is not a common thing among scholars examining the macroeconomic implications of public debt. Studies from late twentieth century (Glassman, 1979; Seater & Marion, 1985; Becker, 1995) and slightly before the ramifications of the financial crisis (Reitschuler, 2008) found a positive effect of public debt on household spending. Others such as Reiter (1997) and Gogas et al. (2014) found no effect of debt on household consumption trends.

This study was consistent with related literature concerning implications of debt servicing on household consumption expenditure. Ditimi et al. (2021) concluded that decline in household spending and high cost of living in Nigeria was exacerbated by the rise in debt servicing expenditure in the country, necessitating households to save more. According to Kusairi et al. (2019), whether the debt obligations of a country have an immediate and direct effect on its people varies with the magnitude of the obligation. That is, where a country is not forced to raise taxes to raise the repayment money, households are not directly affected by the debt.

The observation that exchanges rate has a significant effect on household consumption is also supported by published literature such as Chishti et al. (2019), Bahmani-Oskooee and Xi (2012), and Bahmani-Oskooee et al. (2015). However, whether exchange rate affects household spending is subject to the consumption habits of the households of a country as pointed in Bahmani-Oskooee et al. (2015) and supported by Chishti et al. (2019). The negative effect of the former is more pronounced in countries where consumer goods are imported compared to where consumer goods are produced locally. Chishti et al. (2019) found that this situation characterized developing economies and a few developed ones than it did emerging economies.

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Nonetheless, the regressed model showed that there are other factors that could explain significant changes in consumer spending beyond the regressed variables. This study had a significant intercept depicting that household consumption was influenced by other factors beyond the regressed model, an observation that was consistent with published studies. In Kusairi et al. (2019), household consumption was affected both in the short run and long run by an array of macroeconomic factors including capital accumulation (long run), real interest rate (long run), government expenditure (short run), and inflation (long run). Li et al. (2017) also observed that inflation expectations influenced spending patterns among households in China across economic sectors. Soon et al. (2017) further support this observation with their finding that household consumption was influenced by real interest rates in 12 Asian countries.

4.3 Diagnostic Test

The use of the OLS regression framework for the inferential analysis in this study necessitated performing diagnostic tests to ensure that the model met basic assumptions. OLS-fit models have zero autocorrelation, have no multicollinearity, and they are homoscedastic in line with the Gauss-Markov theorem (Zubair & Adenomon, 2021). The outcomes of these tests are highlighted in subsections 4.3.1 through 4.3.3.

4.3.1 Heteroscedasticity Test

This test examines whether the error terms in a model have constant variances (Ker & Tolhurst, 2019). This constancy necessitates a model to have sufficient dataset, without which it is considered unreliable for arriving at meaningful conclusions (Ker & Tolhurst, 2019). The homoscedastic aspects of the regressed data were assessed using Breusch-Pagan-Godfrey (BPG) test as showed in Table 4.8. The null hypothesis for this test was that the error terms had constant variances. This test was performed with a 95% confidence level.

Table 4.10: Homoscedasticity test

F-statistic	1.075697	Prob. F(3,46)	0.3687
Observed R-squared	3.27776	Prob. Chi-Square (3)	0.3508
Scaled explained SS	37.72832	Prob. Chi-Square (3)	0

Source Data: Author's Data (2022)

The rule of thumb for this test is that the null hypothesis is rejected if the probability of the F-statistic or the Observed R-Squared is smaller than the alpha value (Ker & Tolhurst, 2019). The computed p-value for the F-statistic was 0.3687, which exceed the alpha value (.05). To that effect, the null hypothesis that the error terms had a constant variance was not rejected.

4.3.2 Multicollinearity Test

Multicollinearity refers to the correlation between the independent variables of a model (Zubair & Adenomon, 2021). The presence of this correlation in a dataset reduces the reliability of that data in deriving meaningful correlations. The Variance Inflation Factor (VIF) test was used to examine the correlation between the independent variables of this study as shown in Table 4.10.

Table 4.11: Multicollinearity test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.00152	2.691077	NA
CHANGE_IN_PUBLIC_DEBT	0.052943	4.849256	2.015844
CHANGE_IN_DEBT_SERVICE	0.005251	1.40964	1.080258
CHANGE_IN_EXCHANGE_RATE	0.062142	2.345533	1.920543

Source Data: Author's Data (2022)

The decision criterion for this test is that a VIF parameter of 1 denotes zero multicollinearity and weak correlation when the parameter is between 1 and 6. A parameter above 5 denotes moderate

to strong correlation between the independent variables of a dataset (Ker & Tolhurst, 2019). Based on this criterion, the dataset had zero and weak multicollinearity.

4.3.3 Autocorrelation Test

Autocorrelation refers to the correlation of two variables of the same sequence. This test is performed to examine whether a time series and its lagged sequence are mathematically similar (Zubair & Adenomon, 2021). The assumption that the regressed data did not have autocorrelation was tested using Breusch-Godfrey Serial Correlation LM test with the outcomes showed in Table 4.9. The null hypothesis guiding this test was that the data had no serial autocorrelation.

Table 4.12: Autocorrelation test

F-statistic	0.117574	Prob. F (2,44)	0.8894
Obs*R-squared	0.265794	Prob. Chi-Square (2)	0.8756

Source Data: Author's Data (2022)

The rule of thumb is that the null hypothesis is rejected if the computed p-value is smaller than the alpha value. With a probability of .8894 against an alpha of .05, the null hypothesis that the data had no serial autocorrelation was not rejected.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Introduction

This chapter consists of five sections that include study summary, conclusion, and the recommendations made based on the results and discussions herein. The chapter also has suggestions for further research.

5.2 Summary

This study's aim was to establish the public debt's effect on socioeconomic welfare in Kenya. Household consumption expenditure was used as the proxy for socioeconomic welfare given the role it plays as indicator of the wellbeing of a society. A quantitative research approach built on a non-experimental research design was used to actualize this study. Household consumption expenditure was regressed against quantity of public debt, debt servicing expenditure, and real exchange rate against the United States Dollar since 1971 through 2019. The influence of the independent variables on the dependent variable was examined using Pearson's correlation and OLS regression analyses.

Several findings were made from this study. First, there was a moderate and positive correlation between size of public debt and household spending. This correlation was statistically significant at the 5% level of significance. The cause-effect analysis showed that a unit (shilling) increase in borrowing increases consumer spending by 0.253 units (shillings), though at 5%, this observation was not statistically significant. Second, there was a strong but negative correlation between debt servicing obligations and household spending. However, this correlation was statistically not significant at the 5% significance level. The cause-effect analysis showed that a

unit increase in debt servicing expenditure decreases consumer spending by 0.195 units. This observation was statistically significant at 1% level.

Third, there was a strong and positive correlation between household spending and real exchange rate. This correlation was statistically significant at 1% level of significance. The cause-effect analysis showed that increasing the exchange rate by one unit leads to an increase in consumer spending by 0.095 units and was statistically significant at 1% (p<.001). The analysis further showed that the independent and control variables could explain about 28% of the changes in household spending trends across the analysed period. This was also reflected in the intercept of the model, which showed that a substantial amount of the changes in household consumption spending could be attributed to other factors outside the model.

5.3 Conclusion

This study intended to answer the research question of whether public debt, debt servicing burden, and exchange rate impacted household spending as a proxy for socio-economic welfare. On the one hand, this study concluded that while public borrowing has a small positive effect on household spending, the effect is not statistically significant. The study also established that household consumption is negatively affected by debt servicing. This finding was consistent with the conceptual framework which hypothesized that debt financing affect household welfare the repayment finances are raised through taxing the people. The study further showed that exchange rate has a small positive and statistically significant effect on consumer spending. This conclusion is supported by published literature on different fronts, and could be justified both by the fact that household consumption in Kenya is not directly dependent on exchange-influenced imports but rather domestic production.

5.4 Policy recommendations

This study recommends the government to reduce its overreliance on public debt for government financing. Rather, it can strive to increase its revenues from sources that are not directly connected to the consumer such as supporting revenue-generating innovations. The study has showed that debt servicing expenditure has negative and significant effect on household spending, and hence their socioeconomic welfare. A possibility to this scenario is that the government has been raising these finances through introducing new forms of taxes that end up on households' tables. As such, the government should source its debt repayment finances from other areas including expanding the tax base and parastatal revenue. In addition, the government should strive to reduce the connection between consumer goods and import goods. This would help to insulate household consumption from exchange rate shocks and ensure that their cost is not primarily transferred to consumer goods.

5.5 Direction for further studies

Economists might want to expand this study by looking into the following areas: first, there is a need to examine the proportion of consumer goods that are affected by exchange rate to help policy makers shape up national policies. Second, researchers might want to examine the role of inflation in the regression model herein to better understand the factors influencing household spending in Kenya. As noted, this study included only three variables, which notably may not have a large effect on household consumption.

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