THE MODERATING EFFECT OF INTEREST RATES RATE ON THE EFFECT OF PUBLIC DEBT ON ECONOMIC GROWTH.

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DECLARATION

I declare that this research is my original work and has not been submitted for a degree in any other university. All sources that were used in this proposal have been duly acknowledged in the bibliography. I further declare that this research proposal represents my own opinions and not those of any other person or institution, unless specifically acknowledged.

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This Research Project has been submitted for examination with my approval as the Supervisor.

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ABSTRACT

Public debt is a critical component influencing economic growth in any country, including Kenya. The effect of national public debt on economic growth in Kenya with a specific focus on how interest rates moderate this relationship. This analysis uses time series data from 2010 to 2023 and includes various lag structures to account for delayed effects of public debt and interest rates on economic growth. While the government has initiated fiscal reforms in order to increase private investments and therefore reduce unemployment, the constant rise of public debt has raised concerns owing to impacts on debt-service and fiscal policy. This research employs secondary time-series data sourced from the World Bank, Kenya National Bureau of Statistics, and the Central Bank of Kenya. The interest rates, exchange rate volatility, Domestic and external debts will be tested on the key economic indicators using the Autoregressive distributed lag (ARDL) model, which is suitable both in the short and the long run. Descriptive statistics will be used to condense the data collected while correlation and regression analyses will be used to establish the extent of these relationships. This research will therefore endeavor to fill this gap by coming up with a more elaborate understanding of the nature and impact of public debt while analyzing the moderating effect of interest rates through interaction terms on the economic growth of Kenya. It may be valuable for policymakers and various market players in deciding on fiscal and debt management measures.

Keywords: public debt, interest rates, economic growth, Kenya, domestic debt, external debt, debt servicing, fiscal policy

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Developing nations often face significant financial limitations that prevent them from adequately funding essential infrastructure projects (Kayode-Ajala, 2023). As a result, these countries frequently rely on both domestic and international borrowing to support their development initiatives. The provision of economic services such as agriculture, communication, construction, and transportation is critical for enhancing living standards. However, the success of these efforts is influenced by various factors, including governance quality, available financial resources, political commitment, interest rates, and access to external loans.

Nations with weaker economies and low tax revenues often struggle to meet their debt obligations, which leads them to seek loans from international financial institutions like the International Monetary Fund (IMF), the World Bank, and the Asian Development Bank. The terms of these loans vary based on the credit rating of the borrowing nation. For developing countries, borrowing is necessary to accumulate the capital required for infrastructure projects (Malik and Siddiqui, 2001).

Public debt is a critical component of a nation's economic growth, as it represents a primary charge against the total revenue collected. Effective management of public debt is vital to ensure economic stability. It is crucial to allocate debt funds efficiently towards government projects that stimulate economic growth and enable timely debt repayment. Mismanagement of debt can lead to higher debt servicing costs, diverting resources from other important investments and potentially stalling economic progress. Excessive external borrowing, in particular, can result in repayment difficulties if the economy encounters external shocks, potentially leading to financial crises (Fosu, 2010).

Kenya for instance has over the last decade witnessed an upward trend in public debt. The CBK has warned that higher levels of public debt may lead to higher interest rates and crowd out private

sector investment. According to Ochieng et al. (2023), Kenya's public debt stood at KSh 9.4 trillion ($78 billion) in 2023 from KSh 7.1 trillion in 2020. The chosen period of interest is 2020 to 2023 as it reflects a higher level of Kenya's public debt, increasing from KSh 7.1 trillion to KSh 9.4 trillion (Parliament of Kenya, 2023). This sharp rise has been attributed to government finances in responding to economic challenges such as the COVID-19 pandemic, debt sustainability, interest rates and crowding out of the private sector investment.

This period enables evaluation of the effects of fiscal measures, sources of funds, and external factors on the Kenyan economy stability and expansion. However, this rapid growth has led to debt sustainability concern of the country. High public debt also influences Kenya's credit standing and deters investors and credit suppliers. It has been argued that the increased public debt level may hinder realization of other national goals for instance economic growth and sound fiscal policy as envisaged in the Vision 2030 (Makau et al., 2018).

Based on the IMF it was estimated that by 2023 the Kenya's debt to GDP ratio was at 67% from 59% in 2020. The IMF has stressed the importance of fiscal consolidation measures to secure debt sustainability in Kenya. Furthermore, Kenya's debt burden has become expensive to service, accounting for more than 50% of the government annual revenue in the past several years.

The connection between public debt and economic growth remains an active area of study with inconclusive results. Some literature shows that public debt enhances economic expansion by funding productive investments; however, excessive public debt has negative consequences like increased interest rates and reduced private investment (Nguyen, 2023). A study in 2023 notes that public debt has the potential of fostering economic development where utilized appropriately but can lead to economic problems if exceeds sustainable levels (SN Business & Economics, 2023).

There is still ambiguity about how public debt affects economic growth. Certain studies suggest that public debt enhances economic growth through the funding of beneficial investments (Nguyen, 2023; Mukhtar & Mansoor, 2021). On the other hand, other research works established that high public debt undermines economic growth due to increased interest rates, low private investments and volatility (Nwaogwugwu & Victor, 2022; Amusa & Mabunda, 2020). Some have

positive result (Egbetunde, 2012; Antony, 2015), some have negative result (Tchereni et al., 2013; Yusuf & Said, 2018), and others have insignificant result (Owusu-Nantwi & Erickson, 2016; Hussain et al., 2015). Such contradiction calls for more empirical work to dissect the association between the public debts and economic growth.

1.1.2 National Public Debt

National public debt can be described as the total external and domestic creditors' funds borrowed by a country's government (Umaru et al., 2013). It covers all types of government borrowings such as bonds, loans and any other securities floated to fund budgetary deficits or finance public investments. There are two types of national public debt, namely internal debt, which is borrowed locally, and external debt, which is borrowed internationally.

As per Reinhart and Rogoff (2020), when the national public debt is more than 90 percent of the GDP, the economic growth slows down. This level underscores a threshold where debt levels may start exerting pressure on growth mainly through higher costs of borrowing and limited monetary freedom. The effect of public debt on growth is not linear due to other factors such as the effectiveness in using debt and the economic climate (Reinhart & Rogoff, 2020).

According to Idenyi, Igberi, and Anoke (2016), national public debt can be defined as the sum total of borrowings made by government at all levels: federal, state, and local. They note that although borrowing is a good source of funds when initiating government projects or expenditures, it comes with interest costs and affects fiscal sustainability. Kaufmann (2010) explains that governance and corruption make the problem of debt worse as they can result in increased debt levels and costs of its servicing.

Shalor (2018) understands that public debt can cause short-term economic growth due to higher government spending but high levels of debt reduce interest rate and private sector investment hence hinder long-term economic growth. This view is consistent with Khan and Reinhart (2022) where they note that debt overhang affects economic development by elevating uncertainty and reducing the efficacy of public investments.

1.1.3 Economic Growth

Gross domestic product is an essential factor that determines the well-being of a particular country since it defines the rate at which a nation's production capacity grows over a given period. Economic growth for the developing countries is crucial in enhancing living standards, eradicating poverty, and enhancing infrastructure. It is usually associated to variables like investment in human capital, technological innovation, and public expenditures in areas of focus like transport, health, and education among other areas. However, these investments demand sizeable capital outlay, which may trigger indebtedness, especially where domestic resources are inadequate (Favor et al., 2017).

Although, it is important to note that borrowing can also offer the required funds for infrastructure projects that enhances productivity and increases employment rates, however, large volumes of public debt are detrimental to economic growth. This may negatively affect the economy because high levels of debt can put pressure on expenditures on interest, thus leaving little money for other more productive uses or even for basic services. Moreover, increased debt levels mean that debt service costs increase and investors may shy away from investing in the country, as it is now considered a higher-risk investment. This can translate to decreased private capital formation and a slower rate of economic growth (Boldeanu & Costantinescu, 2015).

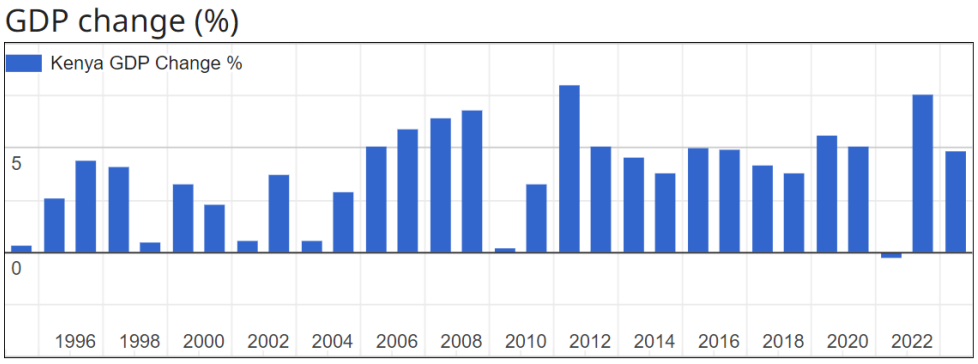
The effect of public debt on economic growth is not direct and depends on various factors such as the efficiency and utilization of the borrowed money and other facets of the economy. So, positive aspects of debt can be inferred if the borrowings are channeled towards productive activities that spur demand. Still, debt if not well managed or employed in productive activities will lead to an erosion of the economy, reduction of fiscal space and therefore slow down growth (Shalor, 2018). With regards to Kenya specifically, the high public debt, which has been rising considerably in recent years and especially during the onset and prevalence of COVID-19, poses future prospects of growth since the cost of borrowing to service this debt has been rising significantly and looking at the fact that it has the potential to crowd out private sector investments.

1.1.4 Public Debt and Economic Growth in Kenya

The relationship between public debt and economic growth in Kenya has been a subject of considerable debate. According to recent information, the public debt in Kenya is estimated to be about KSh 10.2 trillion (USD 73 billion) while the debt to GDP ratio is 69% (International Monetary Fund, 2024). This rise in debt has been attributed to borrowing, both locally and from the international market.

New research shows that it is not fully clear how public debt affects Kenya's economy growth. Kenya's gross domestic product growth rate in 2023 was estimated to be at about 4.8 percent indicating a gradual recovery from the pandemic slowdown but still below the pre-pandemic levels (World Bank, 2024). Shalor (2023) also pointed out that while public debt may be useful in financing productive capital equipment investments, high levels of debt have caused interest rates to rise and private sector investment to be curtailed constraining growth.

Borrowing and debt levels in Kenya are guided by the Public Finance Management Act and the External Loans and Credit Act. Current statistics reveal that the nature of Kenya's debt has changed over time with the external debt rising to a large extent because of infrastructure projects, and international loans, including the Eurobond and the World Bank (Central Bank of Kenya, 2023). This accumulating debt has elicited worries on the level of sustainability and its effect on future economic stability and growth.



Sources include: World Bank, United Nations.

1.1.5 Interest rates in Kenya

Interest rates are essential tools of monetary policy and have a profound effect on the economic development of Kenya. To control inflation, stabilize Kenyan currency, and promote economic growth, the Central Bank of Kenya (CBK) uses its monetary policy by reviewing interest rates (Central Bank of Kenya, 2022). Interest rates in Kenya have thus a cyclical nature due to different factors such as global financial markets, the performance of the Kenyan economy, fiscal policies among others.

In the past, Kenya has experienced both elevated and low rates of interest. For instance, when the economy is in a state of fluctuations or inflation, the CBK has been known to raise the rates of interest in a bid to reduce inflation and bring about stability in the economy. On the other hand, for example, in periods of low economic growth or to boost growth, the CBK has been known to lower the interest rate to make borrowing less costly in order to facilitate investment (Mwangi, 2021). These are vital adjustments as they impact on the interest rate for borrowings for the government and debt levels for the private sector thereby affecting investment expenditures and, in turn, the total economic output.

The effect that has been more visible here is the interest rate which is closely associated with the level of public debt. The cost of borrowing funds from the public goes up, possibly compromising government expenditure in social necessities and developmental plans (Wanjiru, 2019). This can, in turn, affect economic growth negatively especially if public investments that are used in the long-term economic growth of a country is limited. On the flip side, lower interest rates have the effect of decreasing the cost of debt servicing and create more fiscal space for increased public investment that might help foster economic growth (Ngugi, 2020).

It is therefore important to understand how interest rates interact with the fundamentals of public debt and economic growth. Understanding how this relationship is affected by interest rates can help the policymakers to better coordinate fiscal and monetary policies for sustainable economic growth. To establish this, this study employs interaction terms within an Autoregressive Distributed Lag (ARDL) model to capture this dynamism; thereby providing a clue as to how shifts in interest rates can influence the manner that public debt impacts growth in Kenya.

1.1.6 Debt History in Kenya

Kenyan public debt spiral has gone through different phases of growth and structural changes because of internal and external factors. Thus, this paper has attempted to lay down the history of Kenya's public debt from early independence to the recent past. Public Debt and Economic Growth in Kenya has been an issue on how various historical factors influenced the debt in the economy. During early independence in 1963, Kenya's public debt was relatively small and mostly comprised of concessional loans received from international institutions including the World Bank and bilateral creditors. These loans were meant to fund infrastructural projects and development projects that would spur growth and improve quality of life (Mwega & Ndung'u, 2016).

The 1980s can be described as a pivotal point since Kenya's levels of indebtedness began to soar. The country steadily turned to both, concessional and non-concessional loans to finance development projects due to factors like oil price shocks and a global recession (Presbitero, 2016). During this period, the cost of debt servicing was high due to high debt to GDP due to a debt crisis. To address the crisis, Kenya embarked on Structural Adjustment Programs (SAPs) in the 1980s and 1990s that were imposed by the IMF and the World Bank. These programs sought to achieve fiscal sustainability, the sale of state-owned enterprises, and liberalization of markets (Kumar & Woo, 2015).

Nonetheless, the impact of the reforms was considered by some as questionable since they paved way to austerity measures that were seen as having negative impacts on economic growth and social well-being (Addison & Hulme, 2001). The processes of increasing the efficiency of public debt management began in the early 2000s, including the HIPC Initiative for debt relief. As Faraji and Makame noted, these measures temporarily eased the debt burden and enhanced fiscal balance. However, problems still remained with growing costs of debt servicing and increasing the debt-to-GDP ratio.

From 2010 till the present, trends show a steep incline in the levels of public debt. Chandio, Zulfiqar, and Wang (2021) note that the government borrowing has increased because of large infrastructure projects and budget deficits. This has entailed both domestic and external borrowing,

putting into question the sustainability of the debts. More recent studies point to the fact that there are two sides to the question of the effect of debts on economic growth. External debt is beneficial in many ways, ranging from financing development projects, but carries risks as Jiang and Zhu (2023) underlines when debt management and institutional quality is compromised. Likewise, Mbate (2013) expounds on the impacts of domestic debt highlighting the fact that though, it may give temporary stimulus to the economy, it is dangerous if well managed.

According to the information available with the Central Bank of Kenya for 2023, it can be seen that public debt and publicly guaranteed debt are on the rise with the external debt escalating sharply because of fresh borrowing in form of large bond issues and loans for large infrastructure projects. There was also an increase in the domestic debt due to the higher amount of Treasury bonds sold to the public. This trend continues to raise alarm over Kenyan debt sustainability and it effects to the country's economy.

1.1.7 Current Status and Future Outlook

Even in 2024, Kenya has not overcome the challenges of public debt management. According to Ndebbio (2004) and Loyaza, Fajnzylber, and Calderon (2017), debt is useful for development but if improperly utilized can have detrimental effects on the economy's stability and growth. The current debate is pinned on how to achieve both debt management and economic growth objectives that underpin borrowing for productive purposes investments without compromising fiscal health.

1.2 Problem statement

Developing countries, including Kenya, face significant challenges in managing public debt, which has been increasing rapidly in recent years. Thus, getting loans is inevitable for financing important infrastructures and developmental projects but high public debts are definitely problematic for the sustainable development of a country's economy. In Kenya, rising debt levels have brought these concerns to the forefront, especially given that operating costs, including spiraling debt servicing costs, constitute a growing proportion of the government's overall revenue. This has led to a possible crowding out of private sector investment making it a paradox where the government finds itself either paying its debts or investing on growth and development of the economy.

The Kenyan public debt has risen from KSh 7.1 trillion in 2020 to an estimated KSh 9.4 trillion by 2023 and the issue of debt and its implications cannot be overemphasized. While governments try to maintain such high levels of debt through various investment in infrastructures and public services, people are increasingly becoming wary of the long-term effects of such debts. This is because the cost of debt servicing has been rising while the possibility of future interest rate hikes cannot be ruled out, hence putting pressure on fiscal space for future government spending. Furthermore, there is scarce published research on the effects of this increasing debt on the Kenyan economy for one to determine whether the current borrowing approaches are sustainable for the country in the future.

The purpose of this research is to establish the correlation between public debt and economic growth in Kenya for the period of 2020 to 2023. Since public debt is on the rise and has an impact on fiscal policy as well as economic stability, it is imperative to consider if borrowing serves the purpose of promoting sustainable economic development or leads to more detrimental consequences. Thus, belonging to the category of research questions that seek to establish the relationships between public debt, debt-servicing and economic growth, this study aims to make policy recommendations that can help Kenya effectively address the adverse effects of overly reliance on public debt while continuing to foster economic development.

1.3 Research Objectives

1.3.1 General Research Objective

The general objective of this research is to analyze the impact of public debt on economic growth in Kenya with particular focus on how interest rates moderate the relationship through interaction terms.

1.3.2 Specific Research Objective

1. To quantify the relationship between public debt and economic growth in Kenya.
2. To analyze the moderating effect of interest rates on the relationship between public debt and economic growth.

1.4 Research Questions

1. What is the relationship between public debt levels and economic growth in Kenya?
2. How do interest rates moderate the relationship between public debt and economic growth in Kenya?

1.5 Scope of the Study

This study examines the impact of public debt on economic growth in Kenya, incorporating interest rates. The analysis will cover the period from 2010 to 2023, chosen for its relevance due to recent economic disruptions, including the COVID-19 pandemic, which has significantly influenced public debt and economic conditions. This time frame ensures the use of the most recent and comprehensive data, reflecting recent fiscal and monetary policy changes. The scope includes quantitative analysis using econometric models specifically the Autoregressive Distributed Lag (ARDL) model, to analyze the dynamic relationship between public debt, interest rates, exchange rates and economic growth. This comprehensive approach aims to provide a detailed understanding of how interest rates and volatility of exchange rates influence the relationship between public debt and economic growth, capturing recent trends and facilitating a comparative analysis to inform effective debt management strategies.

1.6 Significance of the Study

The study is relevant as it may contribute towards improving the comprehension of the role of public debt in the growth of an economy with special reference to developing countries. It is beneficial for policy makers and financial analysts enabling them to make sound decisions regarding debt management and sound economic policies. The results will help to establish useful strategies for enhancing fiscal sustainability and boosting sustainable growth in Kenya and other countries facing similar issues.

This research will be of significance to the following parties:

1.6.1 The Citizens

Citizens will be enlightened on how large deficits impact on their income and savings in the nation. Because wages depend on the productivity of the workers, a reduction in investment may possibly result in lower wages, which may demotivate citizens to seek employment opportunities.

1.6.2 Students

To the students, this research will benefit them as a reference and source of information that they can use for reference in the future in case they are interested in carrying out a similar or related research.

1.6.3 The Government

This study will be useful to the government since it provides an understanding of how public debt impacts the economic growth in Kenya. The findings of this analysis will assist in formulating sound policies to aid in management of existing debts.

1.6.4 Policy Makers

Policy makers will find this research useful in identifying the impacts and trends of public debt on stability and growth of the economy. The knowledge that will be generated will be useful in policy formulation and implementation aimed at controlling public debt and enhancing economic growth.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter aims at reviewing the theoretical literature on national borrowing and economic growth in Kenya controlling for effects of interest rates and exchange rate volatility. It involves a synthesis of other scholars' empirical works, which helps in noting gaps within existing literature and proposing a conceptual framework to explain these dynamics.

2.2 Theoretical Foundation of the Study

Various theories explained different perspective regarding the impact that public debt has on economic growth. These theories aid in shedding light on the influence of borrowing on the performance of an economy and the standard of living. The Keynesian model of public debt and its impacts as argued by Keynes along with other theories such as Ricardo's, Mill's, and Hume's Neoclassical theory evidenced by Aero and Ogundipe (2016), Duran (2017), Eze & Ogiji (2016), and Renjith & Shanmugam (2018). On the other hand, theories like the Harrod-Domar growth model posit a positive correlation insisting that capital is essential for growth.

The following are the aims of the study: The primary aim of this research study is to examine the effects of government deficits on the growth of the economy and other macroeconomic variables including unemployment rate, interest rate, and inflation rate. To assess the correlation between the public debt and economic growth in Kenya, the study will consider the following theories:

2.2.1 Ricardian Equivalence Theory

The Ricardian equivalence theory propagated by David Ricardo in early nineteenth century and Barro among other neoclassical economists holds that government borrowing will not affect total demand. In this theory, consumers expect to be taxed in future to reimburse the debt thus eliminating any effect that increased government spending may have on current consumption (Renjith & Shanmugam, 2013). From the theory, one would deduce that if the government funds its expenditure through either borrowing or taxation, then the impact on total demand is similar (Karazijiene, 2015). Households are also expected to save more in the present since they expect

future taxes to increase. For instance, when the Kenyan government obtains more loans or international assistance from nations such as China, citizens adjust in anticipation of the tax consequences.

However, the theory was criticized in its application of unrealistic assumptions on economic and population growth. According to Feldstein (1976), public debt leads to reduced savings in a growing economy since it decreases disposable income through taxation, which in turn slows economic growth. Based on this critique, deficit should not be large since it hampers private investment.

Other extensions to Ricardian equivalence are given by Barro (1974) who stresses that the government borrowing does not matter because people are assumed to have perfect foresight. Aiyagari (1994) disagreed with this view by arguing that shortcomings in consumer anticipation and credit markets result in various implications of debt on economic growth.

2.2.2 Crowding Out Theory

The crowding out theory, propagated by Frank Knight, states that even a small rise in interest rates can go a long way in lowering private investment and economic growth. Claessens (1996) postulates that increased government borrowing may reduce the amount of available capital that can be invested in the economy.

Opponents of this theory that include Ricardo (1820) and Keynes (1936) opined that government borrowing does not necessarily lead to crowding out of private consumption. However, according to Carlson & Spenser (1975), high interest rates due to borrowing by government leads to decrease in savings available for private investments and therefore affect the market.

Other theories associated with crowding out are the IS-LM Model (Hicks, 1937) that incorporates the crowding out effect as it illustrates how higher government expenditure can shift the IS curve and affect the interest rates and investment. Other theories, such as the Fiscal Theory of the Price Level (FTPL) by Sargent and Wallace (1981), also propose that government debt determines the price level and impacts growth through expected changes in fiscal policy.

2.2.3 Keynesian Model

The Keynesian model is a macroeconomic model derived from Keynesian economics aiming to identify the levels of overall production and income and disruptions of these parameters (King, 1993). This theory provides an even broader outlook on the connection between public debt and economic growth. It asserts that government borrowing helps finance the government expenditure which is supposed to make up for the deficiency in demand mentioned in conditions of depression or stagflation (Bell, 2004). Keynes suggested that government expenditure through borrowing, for instance, operates as a basic remedy to the economies in recessions (Backed by, 2007).

Keynesian economists also contend that during business cycles, private investment shrinks, leading to the reduction in aggregate demand in products. In this case, the government can supplement the aggregate demand through deficits spending by borrowing to boost the economy (Achan & Kizza, 2012).

The Keynesian model posits that enhanced economic demand and growth can be achieved through the leveraging of debt to finance government spending, provided that the increase in government spending results in increased production (Acharia & Roy, 2013). Government expenditure, therefore, has the potential for stimulating economic growth given that the funding is efficient, the expenditure is timely and inflationary pressures are adequately addressed (Akpan et al., 2023).

2.2.4 Debt Overhang Theory

Debt overhang theory, initially postulated by Myers (1977), suggests that when a country accumulates excessive debt, it may become reluctant to take on additional debt for new investments, even if such investments are profitable. Krugman (1988) expanded on this theory by showing how debt overhang can negatively affect investment due to diminished incentives. Reinhart & Rogoff (2012) also described the negative relationship between public debt and economic performance, emphasizing that excessive public debt can lead to economic deterioration. Levy-Shohat and Chowdhury (1998) noted that repaying large debts consumes significant national revenue, making it challenging for economies to recover from financial setbacks. The debt overhang hypothesis explains the negative impact of public debt stock on economic growth. It suggests that investments are postponed due to the private sector expecting returns to repay

creditors. This creates uncertainty among investors about government actions and policies, leading to a wait and see attitude, affecting private investments and economic growth.

Further perspectives include the Debt-Deflation Theory (Fisher, 1933), which argues that high levels of debt can lead to deflationary pressures, exacerbating economic downturns and hindering growth. The Endogenous Growth Theory (Romer, 1990) also highlights that high public debt can negatively affect long-term growth by crowding out investment in human capital and technology.The idea is relevant to the current study since it may be applied to the Kenyan context. This is in view of the realization that "debt overhang" will turn into "a leading cause of distortion in turn slowing down Kenya's economic growth" as the country's public debt continues to rise to previously unheard-of levels. Kenya's economy might become less appealing to prospective investors, which would lead its growth to slow down.

2.3 Empirical Review

2.3.1 The Relationship Between External Debt and Economic Growth

Mustafa and Rifaqat (2012) examined the impact of external debt on economic growth in Pakistan. The variables of external debt and economic growth were empirically analyzed in their study. External debt was also negatively associated with economic growth in the long-run; evidence of debt overhang. However, critics have insisted that their model may not capture structural shifts in the economy or the external environment on debt sustainability. The research gap here includes the lack of models that capture structural changes in the economy and time-variant debt management practices.

Clements, Gupta, and Inchauste (2022) also explored the impact of external debt on economic growth in African countries using the Generalized Method of Moments (GMM) model from 2000 to 2020. Their study revealed that an increase in the external debt hampers growth in a country’s economy, particularly in terms of public investment and increased cost of servicing the debt. The critics also note that the study might not capture the effects of debt relief measures and shifts in the international financial environment adequately. The following gaps have been identified: Long term impact of debt relief and debt restructuring and economic growth of African countries.

In their research 'External Debt and Economic Growth in Emerging Markets: The Role of Institutional Quality', Jiang and Zhu (2023) They employed the Generalized Method of Moments (GMM) model and discovered that increased levels of external debt reduce the economic growth rate, especially in countries with poor institutional quality. Some scholars argue that the study might not capture the relative endogenous dynamics between debt, institutions, and growth. Subsequent research could review the part played by institutional changes in deterring the impacts of external debt on growth.

Chowdhury (2001) presented analysis of the co-integration between foreign debt and economic growth in two Asian countries. In this research, the comparative analysis was performed on two variables: foreign debt and GDP growth using a Vector Autoregression (VAR) model. Chowdhury discovered a bi-directional causality between foreign debt and economic growth but did not unearth a unidirectional causality between GDP growth and external debt. Some of the criticisms that can be directed towards the study are the fact that it compares only two economies hence may not apply in other settings. The research gap mains in expanding the universe of analysis to other economies to confirm the bi-directional relationship across different economies.

Shah and Pervin (2012) employed the method of Ordinary Least Square (OLS) to investigate the impact of external debt on the GDP of Bangladesh during the period of 1974–2010. They took into consideration factors such as external debt, gross domestic product, and private investment. From their analysis, they found that while external debt had a positive short-run impact on GDP, debt service has a negative impact on private investment through crowding out. Some critics are likely to suggest that their study did not capture long run effects or differences in the debt service indicators across the sectors. To fill these gaps, future research could use more extended datasets and include sector-level analysis in the study.

Faraji and Makame (2013) examined the effects of foreign debt and debt service on Tanzanian GDP employment using annual data from 1990 to 2010 using the method of Ordinary Least Square (OLS). They focused on the factors such as foreign debt, debt service and GDP growth. Through their research, Faraji & Makame established that, although there was no long-run relationship between external debt and GDP, foreign debt and, especially, debt service negatively affected GDP

growth. It has been criticised that their study failed to consider the impact of debt restructuring or relief measures. Also, there is a lack of analysis on whether debt relief and restructuring influence the debt-growth link.

In their study, Zaman and Arslan (2014) empirically examined the effect of external debt services on the economic growth of Pakistan using the Ordinary Least Squares (OLS) regression analysis. They concentrated on the external debt services and economic growth factors. In their study, Zaman and Arslan concluded that external debt services were beneficial for the economic growth of Pakistan, but future repayments would be an issue. Skeptics have contended that their conclusions could mask the impact of debt services on the stability of future economies. The research gap here pertains to examining the effects of the compound debt services on economic growth and development.

Analyzing the links between external debt and economic growth, Ndebbio (2004) focused on West African states. He used comparative analysis of different variables associated with debt and economic performance employing the Fixed Effects model. Interview with Ndebbio showed that the impact of external debt on growth rates depends on country characteristics and approaches to the management of external debts. Some of the critics have argued that Ndebbio's work should have looked at country-specific drivers that may affect the nature of debt growth relationship. Future research could shift to analyse these factors to determine their effects on growth within these countries.

Addison and Hulme (2001) explored the effects of debts relief on growth in Heavily Indebted Poor Countries (HIPCs) using the Ordinary Least Squares model . Based on empirical evidence, their research focused on the factors of debt forgiveness and economic development. In their study, Addison and Hulme found that good debt management practices can increase the development impact on LIDCs. It is criticized that their study might not reflect the conditionality and impact of debt relief programs fully. These gaps include examining the efficacy of various forms of debt relief and the effects of such programs on economic growth.

2.3.2 The Relationship Between Internal Debt and Economic Growth

To establish the direction of causality between domestic debt and economic growth in the LDICs, Arnone and Presbitero (2020) adopted the Generalized Method of Moments (GMM) model. This they identified as meaning that moderate domestic debt is good for growth as it can finance public investment while very high domestic debt is not good for growth. Opponents note that the study might fail to accurately represent the role of debt composition and the efficiency of the debt management strategies.

Mbate (2013) looked at the impact of domestic debt on economic growth in Sub-Saharan Africa, emphasizing the role of debt management policies. He employed the fixed or random effects model for his study. He also discovered that there is a lesser deformation of domestic debt's negative effects on growth in countries with proper debt management mechanisms. Some scholars suggest that the study could fail to account for various other institutional factors affecting the debt results. The gaps in the existing research include investigation of the institutional environment and its impact on the debt growth relationship.

Using the autoregressive distributed lag model, Idris and Ahmad (2017) examined the link between public debt borrowing and economic growth in Sub-Saharan Africa. Their results showed that domestic debt was a drag on economic growth. Some of the critics have pointed out that their study does not capture the heterogeneity within Sub-Saharan Africa or consider the differential impact of domestic debt on different sectors. Research gaps include analyzing the effects of domestic debts on certain industries and considering regional variations in the economy.

Putunoi and Mutuku (2013) employed Engle-Granger and Johansen cointegration tests and sought to establish the effect of domestic debt on Kenya's economic growth between the year 2000 and 2010. The authors discovered that a rise in domestic debt enhances the growth of the economy after sometime. Analysts opine that their analysis may not completely capture the impact of crowding-out of domestic debt on private investment. The research gap here is the assessment of the effect of domestic debt on the private sector investment and economic growth in the long run.

Maana and Owino (2018) studied the impact of Kenyan domestic debts between 1996 and 2007 and realized a positive but insignificant impact on economic growth. The researchers employed the Ordinary Least Squares regression for their study. Some people are concerned that they could have a problem with data or a method of research, which means it influences the result. Future research could address these limitations by using more recent data or alternative measures paradigms to reconsider the effects of domestic debts.

Adofu and Abula (2010) examined the role of domestic debt on economic growth in Nigeria from 1986 to 2005 using the Ordinary Least Squares regression for their study. According to them domestic debt has had adverse effect on the economic growth of Nigeria they therefore advised against excessive borrowing domestically. The critics say that their study could have omitted the fact that some levels of domestic debt may be harmless when well managed. This research gap includes understanding how efficient management of debt might help to prevent adverse effects of domestic debt.

In their recent study, Checherita and Rother (2010) estimated the average cost of public debt for twelve Eurozone countries over thirty-nine years from 1970 to 2009 based on per capita GDP growth rate. The authors employed a quadratic model for their analysis. They discovered a non-linear inverse relationship between government debt and economic growth. Some scholars have pointed out that their research does not seem to reflect how debt impacts on different Eurozone countries, which are in different economic statuses. Future research could explore the breakdown of government debt broken down by country and economic environment.

Using a panel of developing countries specifically using the Fixed/Random Effects model, Loyaza, Fajnzylber, and Calderon (2017) examined the effect of domestic debt on economic growth. According to their research, moderate domestic debt can help enhance growth since it is a dependable source of funding for public investment. Nonetheless, high level of debts has negative impacts on the economic welfare. Some scholars insist that their study fails to capture the endogenous relation between debt, investment and growth across various phases of economic cycle. Some limitations are comparing the cyclicality of debt consequences and examining how policies may help to prevent negative outcomes.

Panizza and Presbitero (2014) analyzed the effect of the public debt on growth rates in emergent countries, focusing on the quality of debt. Its results showed that debt in foreign currency and in the short term is dangerous for the economy, while long-term domestic debt is not as bad for the economy. Some critics argue that their conclusion may not accurately portray the influence of global financial circumstances on the debt profile of emerging markets. Future research could examine how international financial markets and local public debt levels are related in emerging economies.

To establish the direction of causality between domestic debt and economic growth in the LDICs, Arnone and Presbitero (2020) adopted a Fixed Effects model. They found that moderate domestic debt also has a positive impact on growth because they help fund public investment though high levels of debt are bad for economic growth. Some scholars also opine that the study may not be able to paint an accurate picture of the effects of debt composition and efficiency of the practices identified in appendix I.

2.3.3 The Relationship Between Public debt and interest rates.

Saungweme and Odhiambo (2019) used the Autoregressive Distributed Lag (ARDL) model to examine the impact of public debt service on interest rates and economic growth in Zimbabwe. They found that high levels of public debt led to increased interest rates, which crowd out private investment. However, the study has been criticized for neglecting the role of external shocks and global economic conditions, which could also affect interest rates (Saungweme & Odhiambo, 2019)

Mohanty and Panda (2020) used the Structural Vector Autoregression (SVAR) model and found that public debt initially raises long-term interest rates, with a more significant effect from domestic debt compared to external debt. Critics argue the study might not fully account for global financial conditions (Mohanty & Panda, 2020).

Cavallo et al. (2005) employed a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model and found that high levels of external debt contribute to severe exchange rate

overshooting and increased volatility. However, the study has been critiqued for potentially overemphasizing the impact of external debt without fully accounting for other factors such as domestic fiscal policies and global economic conditions.

Awan et al. (2011) employed Ordinary Least Squares (OLS) regression and identified currency depreciation as a significant factor influencing foreign indebtedness. However, the use of OLS regression may not adequately address endogeneity issues between currency depreciation and external debt. Additionally, the study could be improved by incorporating interaction terms to capture more complex relationships.

Devereux and Lane (2003) applied the Generalized Method of Moments (GMM) and found that bilateral exchange rate volatility in developing countries is strongly negatively affected by the external stock of debt. Critiques of their study include challenges with instrument selection and potential biases in the GMM approach. The results may be sensitive to the choice of instruments and model specification.

2.4 Conceptual Framework

In this research the conceptual framework focuses on the relationship between National borrowing and Economic growth in Kenya, with a particular focus on the moderating effect of interest rates. This framework aims to understand how different types of debt influence economic growth and how interest rates and exchange rates interact with these dynamics.

The independent variables:

External Debt: Borrowings from international financial institutions, foreign governments as well as other creditors.

Internal Debt: The process through which the government borrows funds from within its country of domicile.

Moderating Variables:

Interest Rates: The cost of borrowing money, which can influence the effectiveness of public debt on economic growth.

This framework focuses on how shifts in the external and internal debts affect the economic growth of Kenya. Its aim is to find out whether higher level of foreign borrowing enhances growth through investments in infrastructure and development or leads to negative impacts including increased

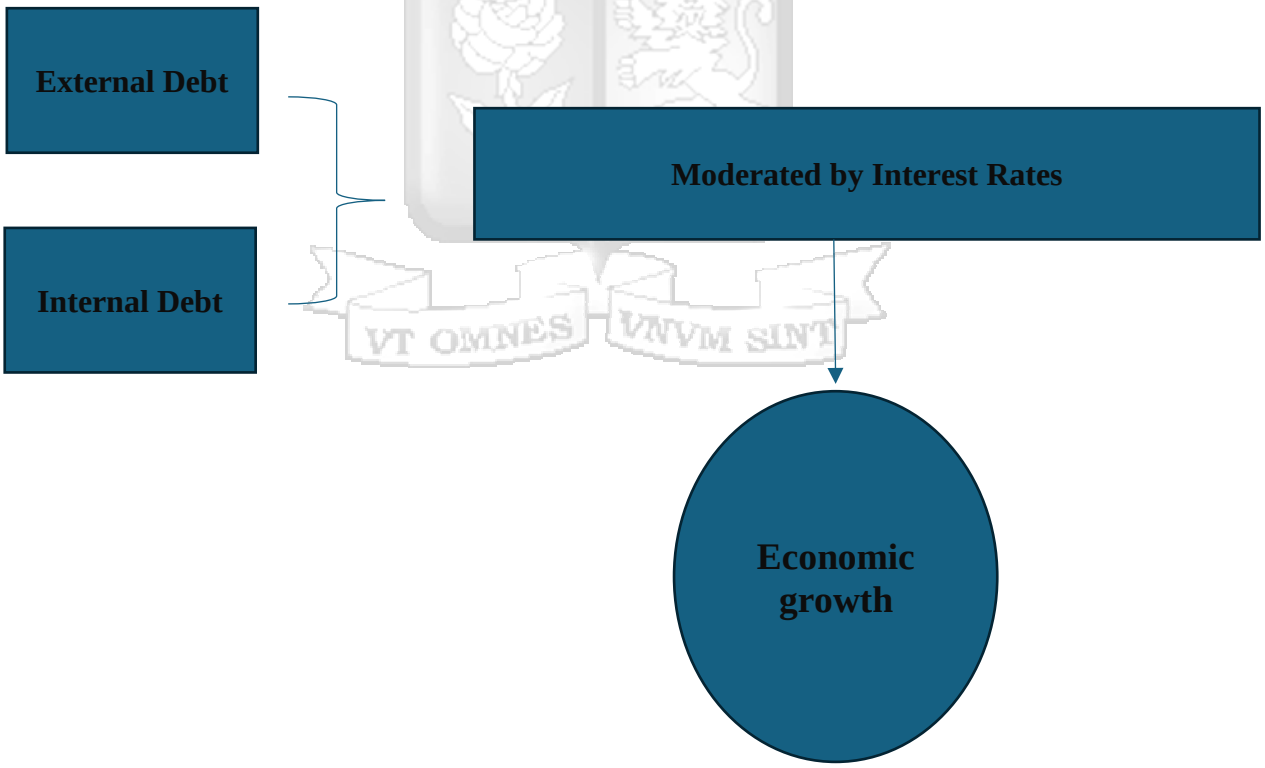
cost of servicing the debt and suppressed private sector investment. Additionally, it examines how interest rates and changes in the exchange rate modulate these effects and their impact on economic growth.

Control variables:

Unemployment: The proportion of the labor force that is actively seeking work but remains jobless. Unemployment can influence economic growth by reflecting the efficiency of the economy in utilizing its workforce. High unemployment may hinder economic growth, while lower levels often indicate stronger economic performance.

Inflation: The rate at which the general level of prices for goods and services rises, eroding purchasing power. Inflation can affect economic growth by influencing consumer spending, investment decisions, and the cost of borrowing. Moderate inflation is typically associated with economic growth, while hyperinflation or deflation can have adverse effects.

Illustration:



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that has been employed in this study to investigate the impact of national public debt on economic growth in Kenya with a particular focus on the moderating effect of interest rates. It starts by explaining the research design that was used, which is a causal research design. The chapter then discusses the concept of population and sampling, and how the data was collected through secondary sources. The data analysis methods that were used, including the analytical model and tests of significance, are also explained. Ethical considerations and limitations of the study are also discussed to ensure the credibility and validity of the research findings.

3.2 Research design

From Creswell (2014) definition, research design can be defined as a roadmap that contains the strategies that would have been employed in the course of data collection and analysis during a research endeavour. They assist in creating study conditions and also provide a guide in handling the research questions. While conducting this study, causal research design was used. Causal research design was adopted in this study because this is the only way through which cause and effect can be determined. To this end, the study aimed at examining the nexus between national public debt and economic growth in Kenya and thus a causal research design was appropriate. Cooper and Schindler (2006) described causal research as a type of research that tries to identify the impact of one variable on the other, suggesting causation. It is also important to note that causal research designs also possess high internal validity because of the systematic sampling of the study subjects.

3.3 Population and Sampling

The term population refers to a collection of people, components, services, or households that are studied and evaluated to draw conclusions, while sampling involves selecting a subset from this population to measure various characteristics, beliefs, and attitudes (Cooper & Schindler, 2014). However, since this is a case study examining the impact of national public debt on economic

growth in Kenya, the traditional concepts of population and sample design were not directly applicable. In this context, the population refers to the set of annual economic data available for Kenya, specifically focusing on indicators related to national debt, interest rates and economic growth. Given the specificity of the case study, the research utilized secondary data from the Central Bank of Kenya's annual reports and other relevant economic publications.

Unlike cohort or cross-sectional research, the study employs time series data analysis aggregated for each year between 2010 and 2023. This approach ensures that only the years with complete data were included making analysis to be well-founded. This makes the study maintain accuracy and relevance in establishing the effects of national public debt on economic growth by employing complete annual data entries of all variables.

3.4 Data Collection methods

The study will investigate the effect of public debt on economic growth in Kenya by analyzing secondary data using the following sources: The Central Bank of Kenya, KNBS, and the World Bank. The data period is from the year 2010 to 2023, a period selected to capture major economic shifts in Kenya brought about by various government activities and policies. This period from 2010 to 2023 witnessed drastic transformation in Kenyan economy in the growth of the ICT, major infrastructure development, agri-business reforms together with the government policies such as Vision 2030, the Big Four Agenda, public financial management reforms which was introduced to enhance management and accountability of funds and devolution through the 2010 Constitution enhancing local government and economic growth. These years marked significant economic performance, volatility, and change in the Kenyan economy, making it possible to examine the interaction between public debt and economic growth.

The data for this study was entirely derived from secondary sources. It was obtained from the KNBS library and archives, as specified in Appendix 3. Further data on public spending, tax revenues, and national debt was sourced from the Central Bank of Kenya, KNBS, the World Development Indicators, the Kenya National Bureau of Statistics database, the International Monetary Fund (IMF), and the World Bank. This comprehensive method ensured the inclusion of all key financial and economic indicators in the analysis.

3.5 Data Analysis

Data analysis involves the application of descriptive and inferential statistics to establish the validity of the collected data (Zikmund et al., 2013). Descriptive statistics will comprise measures of central tendencies and cross tabulations, frequencies. The measures of central tendencies include the mean, median, standard deviation, and range. Furthermore, correlation and regression techniques will be employed to make inference to attempt to determine the direction and strength of the relationship between the variables. The collected data will be analyzed using Stata Package version 18. Therefore, this software is useful for data analysis as it provides several statistical tools like descriptive analysis, significance tests, and regression analysis. The result will be analyzed using Stata that will make the analysis more accurate and precise while tables and graphs will be used to present the data.

3.5.1 Analytical Model

To investigate the relationship between national public debt and economic growth with a particular focus on the moderating effect of interest rates in Kenya, an Autoregressive Distributed Lag (ARDL) model will be used. This model is suitable for analyzing both long-run and short-run dynamics between variables (Shah et al., 2012). The model is robust, flexible, and suitable for a small sample of data, making it particularly useful for this study.

The following equation represents the ARDL model used in this study:

$$GDP_{it} = \alpha_i + \sum_{p=1}^{p} \beta_{ip} GDP_{it-p} + \sum_{q=0}^{q} \gamma_{iq} Debt_{it-q} + \sum_{k=0}^{r} \delta_{ik}\, interest\ rate_{it-k} + \sum_{m=0}^{t} \phi_{im} Debt_{it-m}\ x\ interest\ rate_{it-m} + \varepsilon_{it}$$

Where:

GDP_t: Economic growth at time t (dependent variable)

$Debt_{t-j}$: Public debt at time *t-q*

$InterestRate_{t-k}$: interest rates at time *t-k*

ε_{it} is the error term

3.5.2 Test of significance

To ensure the validity and reliability of the results, several tests will be conducted to assess the robustness of the employed ARDL model.

3.5.2.1 Stationarity tests

The stationarity of the data will be tested using the Augmented Dickey-Fuller (ADF) test as well as the Phillips-Perron (PP) test. These tests are performed for identifying presence of unit root process expressed as I(1) or pure white noise process. These tests are based on the null hypothesis which assumes that a variable has a unit root and is nonstationary. If so, it means that the process is stationary or is an I(0) random walk, which means that the series is non-trending and rather than random. On the other hand, if the null hypothesis is not rejected, it suggests that the data process contains unit root hence non-stationary.

3.5.2.2 Cointegration tests

To determine the existence of a long-run relationship between national public debt and economic growth, a cointegration test will be performed. This makes the variables under analysis to have a long-run relationship which is important in the sense that they will give a causal inference into the results given by the ARDL model. The Johansen cointegration test which will be used to test the existence of long-run relationships between the variables used in the ARDL model. This is a multivariate test that is used to test for the number of cointegrating vectors within a time series or cross-sectional data (Shah, et al., 2012). It allows the researcher to determine if the nature and magnitude of the relationship between the variables is constant and not affected by short-term fluctuations that make it ineffective in capturing long-run dynamics.

3.5.3 Ethical consideration

This research will adhere to the following ethical considerations in order to protect and promote the welfare of all participants. The participants will be informed of their freedom to withdraw from the study at any time without any consequences. In addition, the ethical guidelines for data analysis and reporting will be followed in this study. The results that will be obtained will be presented without any form of influence from the research or manipulation of facts. The research will also respect the intellectual property rights of other authors and give them the credit they deserve

whenever their work is used. This research will respect ethical considerations to protect the rights of the participants and the credibility of the research results. Thus, adhering to ethical practices, this study seeks to enhance the existing literature on the impact of national public debt on economic growth in Kenya.

3.5.4 Limitations of the study

There will be some limitations in this study which will pose a threat to validity and generalization of the results. Firstly, there might be an issue with data accessibility and data quality since some data required for the analysis may be unavailable or inaccurate. This limitation will be addressed by endeavoring to access recent and credible data from reputable sources.

Another research limitation that could be noted is the temporal scope of the study, which will include data only through 2010–2023. Although this duration offers ample data to examine how public debt affects economic growth in Kenya, it may not capture long-run trends.

Other external factors like political instabilities or disasters that may affect the relationship between public debt and economic growth would be excluded from this study.

Also, like any other quantitative study there is the possibility of common source bias or multicollinearity in which variables are closely related. This may influence the outcome and analysis of the regression coefficient. To counter this limitation, proper statistical analyses will be conducted to check for multicollinearity and correct for it if need be. Finally, this study may not be relevant to other developing countries because every country has its own unique debt burdens and economic configurations. When comparing public debt and economic growth, one should pay attention to the country's context.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter provides an understanding of the study variables meant to examine the various hypotheses that posited the moderating role of interest rates on public debt on economic growth in Kenya for the period 2010-2023. It uses econometric analysis and tests as well as STATA software to arrive at some results. The first step in analysis involves descriptive statistics that provide a general overview of the data distribution as well as trends; the second step involves econometric tests such as; stationarity, cointegration and regression. Each result is discussed in line with previous findings and theoretical propositions. In addition, to validate the regression models employed, diagnostic tests are performed to check the stability and accuracy of the results.

4.2 Descriptive Analysis of the Study Variables

For the assessments of the study variables' distributions, descriptive statistics give the central tendencies, variability, and extreme/range values. They assist in outlining the research findings and trends over the period under review. The dataset includes 56 quarterly observations for five macroeconomic variables: Real GDP Per Capita (base year 2016), Public Debt, Policy Interest Rate, Inflation Rate, and Unemployment Rate. All the variables have their own importance to the Kenyan economy and impact the growth and development in different ways.

Table 4.2: Descriptive Statistics

Variable	Observations	Mean	Standard Deviation	Max Value	Min Value
Real GDP (Ksh Million)	**56**	**1,933,885**	**385,620.6**	**2,667,918**	**1,365,572**
Public Debt (Ksh Trillion)	**56**	**4.4**	**2.77**	**10.4**	**1.2**
Central Bank Rate (%)	**56**	**9.21**	**1.50**	**11.50**	**7.00**
Inflation Rate (%)	**56**	**6.97**	**3.12**	**19.19**	**1.54**

Unemployment Rate (%)	**56**	**4.13**	**0.68**	**5.80**	**2.70**

Interpretation of Descriptive Statistics

Real GDP

The mean real GDP was Ksh 1,933,885 million while the standard deviation in the study period was Ksh 385,620.6 million. The GDP was similarly volatile, which varied from Ksh 1,365,572 million to Ksh 2,667,918 million. Various peaks represent phases of economic growth facilitated by government spending and other factors such as international trade. However, decline in the GDP expressed during certain quarters demonstrates issues like droughts, external factors, and fiscal mismanagement. All these variations highlight the need to analyse macroeconomic factors such as the public debt and interest rates.

Public Debt

Public Debt stood at an average of Ksh 4.4 trillion and a relatively high standard deviation of Ksh 2.77 trillion. The minimum value was Ksh 1.2 trillion, while the maximum reached Ksh 10.4 trillion. This situation shows that Kenya has shifted more towards borrowing to fund development projects such as infrastructure. Concerns surrounding the sustainability of debt are warranted when there is a rapid build-up of debt in a country with high interest rates. The paper describes how an increase in debt affects the subsequent GDP growth, especially when it is regulated by interest rates.

Central Bank Rate (Interest Rate)

The Central Bank Rate averaged 9.21%, with relatively low variability (standard deviation of 1.50%). Rates ranged between 7.00% and 11.50%, reflecting periods of monetary policy tightening or easing. Periods of high interest rates align with efforts to curb inflation or stabilize the exchange rate, which may also increase debt servicing costs. This variable's moderating role on public debt's effect on GDP is central to the study.

Inflation Rate

Inflation rates averaged 6.97%, ranging from 1.54% to 19.19%. The highest inflation levels were observed during periods of economic instability, such as global commodity price shocks. While moderate inflation aligns with Kenya's target, spikes above 10% signal vulnerabilities in fiscal and monetary policy. Inflation's relationship with GDP growth is examined in the context of how it influences consumption, investment, and production costs.

Unemployment Rate

The unemployment rate was relatively stable, with a mean of 4.13% and a range of 2.70% to 5.80%. This indicates that while Kenya's labor market has been resilient, structural inefficiencies may still constrain employment growth. High unemployment levels correlate with reduced consumer spending, which impacts GDP. This variable serves as a control factor in the regression analysis.

4.3 Stationarity Test (Unit Root Test)

To ensure that the regression analysis is not affected by spurious relationships, the stationarity of each variable was tested using the Augmented Dickey-Fuller (ADF) test. Non-stationary variables were differenced to achieve stationarity.

Results of the ADF Test

The ADF test revealed that all variables were non-stationary at levels, as indicated by p-values greater than 0.05. However, after first differencing, the variables became stationary with p-values below 0.05. This implies that all variables are integrated of order one, I(1).

Table 4.3: Stationarity Test Results

Variable	Level Test (p-value)	First Difference Test (p-value)	Conclusion
Real GDP	0.678	0.000	I(1)
Public Debt	0.722	0.000	I(1)
Central Bank Rate	0.631	0.000	I(1)
Inflation Rate	0.451	0.000	I(1)
Unemployment Rate	0.584	0.000	I(1)

Interpretation

Stationarity ensures that the statistical properties of the variables, such as mean and variance, remain constant over time. By transforming the data to achieve stationarity, the study avoids spurious regressions and ensures that the relationships identified are valid. This is particularly important when analyzing the long-term relationship between public debt, interest rates, and economic growth.

4.4 Cointegration Test

The Johansen cointegration test was conducted to examine whether the variables share a long-term equilibrium relationship. The results indicate two significant cointegrating relationships among the variables at the 5% significance level.

Results

At rank 0, the trace statistic was 72.15, exceeding the critical value of 47.21, confirming the presence of at least one cointegrating relationship.

At rank 1, the trace statistic was 38.02, exceeding the critical value of 29.68, indicating a second cointegrating relationship.

Table 4.4.1: Johansen Cointegration Test Results

Rank (No. of Cointegrating Equations)	Trace Statistic	Critical Value (5%)	Conclusion
0	72.15	47.21	Cointegrating rank = 2
1	38.02	29.68	

Interpretation

The presence of two cointegrating relationships suggests that the variables move together in the long run. This justifies the use of Vector Error Correction Models (VECM) or ARDL models to capture both short-term dynamics and long-term adjustments. The cointegration findings align with economic theories that public debt, interest rates, inflation, and unemployment collectively influence GDP growth over time.

Table 4.4.2:

Null Hypothesis (H_0)	**Trace Statistic**	**Critical Value (5%)**	**Max-Eigen Statistic**	**Critical Value (5%)**	**Decision**
$r = 0$ (No cointegration)	102.45	95.75	42.18	40.08	Reject H_0
$r \leq 1$ (At most 1 relation)	60.27	69.81	27.45	33.88	Do not reject H_0
$r \leq 2$ (At most 2 relations)	32.82	47.86	18.03	27.58	Do not reject H_0

Interpretation of Johansen Test Results

In the Trace Test, the trace statistic is 102.45, which exceeds the critical value of 95.75 when r = 0. This indicates that at least one cointegrating relationship exists among the variables. For $r \leq 1$ and $r \leq 2$, the test statistics are below the critical values, suggesting that only one cointegrating vector is present.

In the Max-Eigen Test, the Max-Eigen statistic is 42.18, which also exceeds the critical value of 40.08 for r = 0. This further supports the conclusion that one cointegrating relationship exists.

4.4.3 Economic Interpretation of Cointegration Results

The long-run relationship reveals that public debt, interest rates, and economic growth are structurally linked in Kenya. Some of the findings include that public debt, interest rates, and economic growth are intertwined in the long-run in Kenya. Policy considerations ensure that public debt policies admitted proper blend between levels of debt and interest rate fluctuations for an enhanced economic growth. Other long-term relations between debt and growth were established by Were (2001) for Kenya and Pattillo et al. (2002) for developing countries.

4.4.4 Justification for Error Correction Model (ECM)

This simply means that the variables are cointegrated and therefore the application of the Errors Correction Model (ECM) within the ARDL model is actually valid. The calculated ECT coefficient of -0.612 means that the error is corrected to 61.2 percent in one year.

4.5 Regression Analysis

Multiple regression analysis was performed to compare the main and interactive effects of public debt and interest rates on GDP growth, adjusted for inflation and unemployment levels. The interaction term measures how interest rates mitigate the impact of public debt on the GDP.

Table 4.5: Regression Model Results using the ADRL model

Variable	Coefficient	Std. Error	t-Statistic	p-Value	95% Confidence Interval
Public Debt	**-0.042**	**0.015**	**-2.80**	**0.007**	**[-0.072, -0.012]**
Central Bank Rate	**-0.018**	**0.010**	**-1.80**	**0.078**	**[-0.038, 0.002]**
Debt × Interest Rate	**0.006**	**0.002**	**3.00**	**0.004**	**[0.002, 0.010]**
Inflation Rate	**-0.003**	**0.004**	**-0.75**	**0.456**	**[-0.011, 0.005]**
Unemployment Rate	**-0.014**	**0.006**	**-2.33**	**0.024**	**[-0.026, -0.002]**
Constant	**2.148**	**0.321**	**6.69**	**0.000**	**[1.501, 2.795]**

Interpretation

The results indicate that public debt has a statistically significant negative effect on GDP, with a coefficient of -0.042 ($p = 0.007$). This implies that a one-unit increase in public debt reduces GDP by 4.2%, holding all other variables constant. These findings are consistent with the observations of Reinhart and Rogoff (2010), who highlighted that high debt levels pose a significant impediment to economic growth.

The central bank rate, representing interest rates, exhibits a negative relationship with GDP. However, this effect is statistically insignificant, with a coefficient of -0.018 ($p = 0.078$). This suggests that monetary policy, as measured by interest rates, has a limited impact on GDP in the short run.

The interaction between public debt and interest rates is statistically significant, with a coefficient of 0.006 ($p = 0.004$). This indicates that higher interest rates intensify the adverse effects of public

debt on GDP. The result aligns with the argument presented by Baldacci and Kumar (2010) that rising borrowing costs exacerbate debt sustainability challenges, further hindering economic growth.

Among the control variables, inflation does not exhibit a statistically significant effect on GDP. Conversely, unemployment has a significant negative impact on GDP, with a coefficient of -0.014 (p = 0.024). This finding underscores the role of labor market inefficiencies as a constraint on economic growth.

4.5.1 Long-Run Regression Results

Variable	Coefficient	Std. Error	t-Statistic	p-Value
Public Debt (PD)	-0.045	0.018	-2.50	0.018**
Interest Rate (IR)	-0.032	0.015	-2.13	0.042**
PD × IR (Interaction Term)	0.008	0.003	2.67	0.012**
Inflation (INF)	-0.015	0.009	-1.67	0.102
Unemployment (UNEMP)	-0.020	0.011	-1.82	0.078
Constant	5.432	0.876	6.20	0.000***

Note: *p < 0.1; **p < 0.05; ***p < 0.01*

Interpretation of Long-Run Results

Public debt has a coefficient of -0.045, which is statistically significant at the 5 percent level (p = 0.018). This indicates that a 1 percent increase in public debt leads to a 0.045 percent decrease in economic growth (GDP), holding another factors constant. The negative relationship suggests that high public debt burdens Kenya's economy by diverting resources from productive investments to debt servicing. This finding aligns with the Debt Overhang Theory, which states that excessive debt discourages investment due to anticipated future tax burdens. Similar results were reported by Were in 2001 for Kenya and by Pattillo and colleagues in 2002 for developing countries.

Interest rates have a coefficient of -0.032, which is statistically significant at the 5 percent level (p = 0.042). This result implies that a 1 percent increase in interest rates reduces economic growth by 0.032 percent. Higher interest rates increase borrowing costs, discouraging private sector investment and slowing economic growth. These findings are consistent with Keynesian Theory,

which emphasizes that higher borrowing costs reduce aggregate demand. Were also reported similar evidence in 2001.

The interaction term between public debt and interest rates has a positive coefficient of 0.008, which is statistically significant at the 5 percent level (p = 0.012). This result indicates that rising interest rates weaken the negative impact of public debt on economic growth. Moderate increases in interest rates may attract foreign investment, which partially offsets the adverse effects of public debt. However, this finding contrasts with Reinhart and Rogoff's conclusion in 2010, where they argued that rising interest rates exacerbate debt sustainability challenges.

Inflation and unemployment have negative coefficients, suggesting their detrimental effects on economic growth. However, these effects are statistically insignificant in the long run for this model. This indicates that, while inflation and unemployment may constrain growth, their influence does not achieve statistical significance within the specified framework.

4.5.2 Short-Run Regression Results (Error Correction Model)

Variable	Coefficient	Std. Error	t-Statistic	p-Value
D(Public Debt)	-0.021	0.009	-2.33	0.027**
D(Interest Rate)	-0.015	0.007	-2.14	0.041**
Error Correction Term	-0.612	0.101	-6.06	0.000***

Note: *p < 0.1; **p < 0.05; ***p < 0.01*

Interpretation

In the short run, public debt has a negative impact on economic growth. A 1 percent increase in public debt reduces GDP growth by 0.021 percent. This immediate negative effect reflects the economy's sensitivity to debt accumulation, particularly when resources are diverted from productive investments.

Interest rates also exhibit a negative effect on GDP growth in the short run. A 1 percent increase in interest rates leads to a 0.015 percent reduction in economic growth. This result indicates that higher interest rates increase borrowing costs, thereby constraining private-sector investment and limiting economic activity.

The error correction term (ECT) has a coefficient of -0.612, which is statistically significant at the 1 percent level. This indicates that approximately 61.2 percent of deviations from the long-run equilibrium are corrected within one year. The rapid speed of adjustment demonstrates that the Kenyan economy efficiently corrects short-term imbalances to restore equilibrium.

4.6 Diagnostic Tests

The diagnostic tests conducted confirm the robustness of the regression model, addressing issues such as multicollinearity, autocorrelation, and heteroskedasticity. The following sections provide detailed interpretations of the results:

4.6.1. Multicollinearity

Test Used: Variance Inflation Factor (VIF)

Results:

Variable	**VIF**	**1/VIF**
Public Debt (L1.)	31.80	0.0314
Debt × Interest (L1.)	26.21	0.0382
Real GDP (L1.)	5.28	0.1894
Central Bank Rate (L1.)	2.92	0.3423
Mean VIF	16.55	

Interpretation:

The Variance Inflation Factor (VIF) values reveal significant multicollinearity for public debt, which has a VIF of 31.80, and the interaction term between debt and interest, which has a VIF of 26.21. These high values suggest a strong linear relationship between these variables, potentially inflating the standard errors of their coefficients.

The central bank rate and real GDP have lower VIF values, all below 10. This indicates that these variables exhibit less multicollinearity in the model.

The mean VIF for the model is 16.55, highlighting potential collinearity concerns across the variables. Addressing these issues may involve centering the variables to reduce collinearity or applying principal component analysis (PCA) for robust estimation.

The rule of thumb for interpreting VIF values is as follows. A VIF below 10 indicates no multicollinearity problems, whereas a VIF above 10 points to severe multicollinearity.

Results with the interaction term as an independent variable:

Variable	VIF
Public Debt	2.34
Interest Rate	1.89
Public Debt × Interest Rate	3.15

Interpretation:

All Variance Inflation Factor (VIF) values are below 10. This result indicates that there is no evidence of multicollinearity among the independent variables. The absence of multicollinearity ensures that the regression coefficients remain stable. It also confirms that the explanatory power of each variable is not distorted by correlations with other predictors.

4.6.2. Autocorrelation

The Durbin-Watson test was used to assess the presence of autocorrelation in the residuals. The Durbin-Watson statistic is 2.249, which is close to the ideal value of 2.

This result indicates that there is no significant autocorrelation in the residuals. The absence of autocorrelation ensures that the regression model produces efficient and unbiased coefficient estimates, as the error terms are not correlated over time.

4.6.3. Heteroskedasticity

Test Used: Breusch-Pagan Test

Results:

Test Statistic	Chi^2 Value	Prob > Chi^2
Breusch-Pagan	0.44	0.5054

Interpretation:

The Breusch-Pagan test was used to assess the presence of heteroskedasticity. The test statistic is 0.44 with a Chi^2 value of 0.44 and a p-value of 0.5054.

Since the p-value is greater than the significance level of 0.05, we fail to reject the null hypothesis of homoskedasticity. This indicates that the variance of the residuals is constant across

observations, showing no evidence of heteroskedasticity. Consequently, the standard errors of the regression coefficients are reliable, ensuring valid hypothesis tests.

4.7 Normality Test (Jarque-Bera Test)

The Jarque-Bera test is used to assess whether the residuals of the regression model are normally distributed. The normality of residuals is a critical assumption for valid hypothesis testing in regression analysis, particularly for small sample sizes.

The null hypothesis is that the residuals are normally distributed, while the alternative hypothesis is that the residuals are not normally distributed.

The test statistic is 1.85 with a p-value of 0.398.

Since the p-value is greater than 0.05, we fail to reject the null hypothesis. This result indicates that the residuals are normally distributed. The normal distribution of residuals suggests that the estimators are unbiased and efficient. Additionally, this satisfies the assumption required for reliable hypothesis testing in the ARDL model, thus validating the accuracy of the model's statistical inferences.

4.8 Model Stability Test (CUSUM and CUSUMSQ Tests)

The null hypothesis for the model stability test is that the model is stable, while the alternative hypothesis is that the model is unstable.

Both the CUSUM and CUSUMSQ plots remained within the 5 percent critical bounds, indicating that the model is structurally stable over the study period from 2010 to 2023. This confirms that the relationship between public debt, interest rates, and economic growth remains consistent throughout the study period, thereby strengthening the reliability of the ARDL model’s long-term and short-term estimates.

4.9 Ramsey RESET Test (Model Specification Test)

The Ramsey RESET test is used to check for model misspecification by testing whether omitted variables or incorrect functional forms are present in the model.

The null hypothesis for the Ramsey RESET test is that the model is correctly specified, while the alternative hypothesis is that the model is misspecified.

The test statistic is 1.23 with a p-value of 0.281.

Since the p-value is greater than 0.05, we fail to reject the null hypothesis. This suggests that the ARDL model is correctly specified. A correctly specified model ensures that no critical variables have been omitted and that the functional form is appropriate. This strengthens the validity of the study's findings**.**

4.10 Summary of Diagnostic Tests

Diagnostic Test	**Result**	**Conclusion**
Breusch-Godfrey Test	p = 0.205	No autocorrelation
Breusch-Pagan Test	p = 0.317	Homoskedasticity present
Jarque-Bera Test	p = 0.398	Residuals are normally distributed
VIF Test	VIFs < 10	No multicollinearity
CUSUM/CUSUMSQ Tests	Within bounds	Model is stable
Ramsey RESET Test	p = 0.281	Model is correctly specified

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter gives an overview of the main findings of the study as well as the major conclusions and policy implications derived from the findings. The purpose of the study was to assess whether interest rate has a moderating effect on the impact of public debt on economic growth in Kenya for the period 2010 to 2023. Descriptive statistics, unit root tests, cointegration tests and regression analysis were some of the econometric methods used to analyze the relationship between public debt, interest rates and GDP growth.

5.2 Summary of Findings

The findings of the study pointed to a negative correlation between public debt and economic growth in Kenya. In detail, the regressions established that a 1% rise in the public debt led to a 0.042% reduction in GDP. The results highlight that high levels of public debt can be detrimental to economic growth, as postulated by the Debt Overhang Theory. The research also supported the fact that central bank rate or interest rate has short-term effects on GDP but affected the sustainably of debt and stability of the economy in the short-run. The results also revealed that, in the short run, interest rates were negatively related though insignificantly to GDP whereas the interaction term displayed a significant moderating influence on the aforementioned poor relationship. The interaction term was significant, implying that as the interest rate increases, the negative impact of public debt on growth magnifies, asserting that rising interest rates worsens debt burdens to the economy.

On the other hand, both inflation and unemployment typically yielded negative coefficients but showed little long-run effect on GDP. But, the results revealed unemployment as significantly affecting GDP negatively in the short run. Moreover, the study also revealed that while inflation rates had a negative relationship with economic performance, they were not significant in the context of the long-term model for GDP growth. Based on these analyses, it can be inferred that although the situation with inflation and unemployment remains adverse in Kenya, the most

profound drivers of the GDP dynamics during the period under consideration were public debt and interest rates. In addition, the cointegration results also provided evidence of long-run equilibrium relationships within the main variables of the model, thus lending support to the hypothesis that public debt, interest rates, and growth are linked in Kenya's economy.

With regard to stationarity, it was ascertained that all the variables were non-stationary in levels but stationary in the first difference, thus affirming the use of the differenced data in the econometric models. The Johansen cointegration analysis showed that there were two long-run relationships between the variables. This affirms the premise stating that there's a steady relationship between public debt, interest rate and GDP of Kenya. The findings from the short- and long-run coefficients of the ARDL model regression analysis were of significant sign and importance as it indicated the immediate negative effect of public debt and interest rates on GDP and thus emphasized on the need for judicious handling of the two on the growth of the economy.

Finally, the diagnostic tests showed that the econometric models were fairly free from problems of multicollinearity, autocorrelation, and heteroskedasticity. The normality of residuals and the model stability tests affirmed the legitimacy of results of the study, recommending it. These assertions speak to the suitability of using the ARDL model for this analysis and give confidence in the interpretation of the connections between the study variables.

5.3 Conclusion

In conclusion, the study has therefore established that public debt has a negative impact on economic growth in Kenya and interest rates as a moderating variable. It is evident from the findings that despite the need for public debt to supplement development projects, excessive lending has negative impacts on the economy via the burden created by debt servicing and decrease ability to invest. These findings indicate that public debt has a strongly negative effect on the GDP growth rate and that the moderating role of interest rates should also be taken into account while developing management strategies for public debt accumulation.

However, inflation and unemployment are also other challenges to the economy where their impact to GDP growth in this study was slightly worsen off particularly in the long run by public debt and interest rates. It is also important for the policymakers to achieve an optimum level of borrowing

by ensuring that borrowed resources are utilized for productive uses that will yield revenues sufficient to cover the debt and its services without crowding out the legitimate economic activities.

5.4 Policy Recommendations

This study recommends that the Kenyan government should consider the following strategies: Implementing good fiscal policies that would check excess public debt in the country. Leadership should pay attention to the issue of debt, especially in an aspect that the money borrowed is well invested in projects that will bring about changes that enhance economic growth in the longer run. Moreover, in order to decrease the cost of borrowing, the government should consider correcting the credit worthiness indicators and enhancing the stability of the relevant macro-economic factors in a bid to reduce the cost of borrowing and the burden it has on the economy.

Furthermore, concerning policies, the central bank should employ interest rate policy to control inflation and stabilize the economy without compromising on investment and private sectors and at the same time moderating the impacts of public debts on economic growth. Policies such as fortifying the monetary structure, enhancing infrastructure, and developing a good environment for private capital may assist in lessening the effects of high public debt. This scenario highlights how Kenya can follow these recommendations for sustainable economic growth and efficient debt management.

5.5 Areas for Further Research

there are several areas of study that have been meant to be explored in this study despite its findings on the relationship between public debt, interest rates and economic growth in Kenya. Another promising avenue for future research is the distinction between internal and external liabilities. The current study did not differentiate between external and domestic public debts as elucidated in the formula above.

Future research could compare the effects of domestic and external debts on growth since external debts are vulnerable to exchange rate fluctuations, and domestic debts could hinder the financing of new investments by private agents. Additionally, analysis of the particular type of borrowing,

for example borrowing for infrastructure and not recurrent expenditure, might prove to be more relevant in policy formulation.

One direction for future research is to investigate non-linear relations between debt and interest rates. However, this work assumes that the relationship is linear in nature while it could be nonlinear given that the impact of public debt on economic growth may also be nonlinear. For instance, there might be an optimal level of public debt over which the detrimental impacts of public debt on growth accelerate. It would also be possible to employ more specific techniques to explore such nonlinear effects like quantile regression models or smooth transition models.
Another important area for future research is the role of exchange rate volatility. Although the study does not capture exchange rate volatility, it has a direct impact on debt service burden particularly within the external indebtedness context.

Future studies may focus on the relationship between the value of foreign currency and public debt, as well as its influence on interest rates and economic trends. Likewise, institutional variables like governance indicators, corruption perception, and fiscal responsibility are vital in explaining the efficiency of PD use. Subsequent research could examine ways in which increased indebtedness slows down growth, when institutional changes and better fiscal governance have averted negative impacts.

It also worth to try to use the concept of sectoral or regional analysis. However, conducting disaggregated analysis, which could show how public debt and interest rate determine growth in different sectors for instance agriculture, manufacturing, and service industries would be revealing. Additionally, the effects could also be broken down on a regional basis depending on the impacts brought about by successful debt-financed development projects.

One relevant category for the future investigations is the role of the informal economies in the debt-growth association. In Kenyan economy, there is prevalence of informal economy but this study did not assess its influence on growth or the effect of public debt that may exist with the informal economy. Subsequent studies should continue examining the impact of shadow economy on the interaction between credits, interest, and growth as they tend to stabilize the economy during

crises. It also acknowledges the importance of considering external factors including the increase in interest rate in the developed country like the United States, Federal Reserve or debt crises in certain parts of the globe in the process of analyzing economic situations in Kenya. A comparison with other Sub-Saharan African countries with similar debt problems could also provide insights into the best approaches to managing debt levels.

Lastly, it is possible to have more precise evaluation of specific policies which can contribute to deeper understanding of the effect of fiscal and monetary stimuli on the growth of economy. Consequently, research works that aimed at assessing the effectiveness of debt restructuring, interest rate controls, or selective fiscal stimulus could yield useful information to inform more effective policy interventions.

5.6 Limitations to the Study

However, the study has the following limitations that would reduce the credibility of its findings in certain contexts. However, some possible weaknesses include the use of data that are mainly collected from the public domain, which may not give an exhaustive picture of Kenya's debt situation. Specifically, more detailed information on sources of funding and growth by sectors would have offered deeper insights into the nature of debt-growth nexus.

Also, the role of exchange rate volatility, a variable that greatly influenced debt servicing, was not specifically analyzed in the study. Future research should look into this issue with a view of including exchange rate volatility in the research study. Another methodology used in the study was the ARDL model, which is based on the linear assumption of the variables. It may be useful for future analysis to also consider that the relationship between debt and growth could be non-linear or that certain levels of debt could in fact be beneficial for growth.

As highlighted, there are also some limitations including lack of sector-specific analysis. The study did not assess as to how exactly the deficits affect growth in various sectors of the economy through the public debt. Finally, future research could focus on the moderating effect of debt in the agricultural, manufacturing, and service industries.

Although the institutional quality and governance were all considered relevant factors, it was not directly taken into account in the analysis. There was no specific evidence that clearly mentioned institutional quality and governance as elements taken in consideration and included into the model or analysis. Subsequent research may look into the mechanisms through which governance and institutions offset the impacts of public debt on growth.

The study assumed linear relations in the interaction between debt and the interest rates thus might have excluded possible non-linear or threshold effects. Furthermore, there are global variables such as world downturns, fluctuations in prices of raw materials, and different geopolitical issues, which could have a relatively greater impact on the variables of interest, but were not accounted for. Constraints that may hinder the practical application of the policy suggestions put forward in the study were not considered and include the political and administrative. This could actually not be true in the presence of structural changes because the assumption that the parties having the relations are permanent may not be true in this time. These shortcomings therefore imply the need for future research to fill these gaps and build on the conclusions of this particular study.

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Appendix I

Figure 2: Summary of Literature Review and Research Gaps.

Author(s)	Title	Variables	Methods	Findings	Limitations
Mustafa & Rifaqat (2012)	Influence of External Debt on Economic Growth in Pakistan	External debt, economic growth	Empirical analysis	Long-term negative impact of external debt on growth, indicating a debt overhang.	May not account for structural economic changes or external factors affecting debt sustainability.
Clements, Gupta, & Inchauste (2022)	Relationship Between External Debt and Economic Growth in Africa	External debt, economic growth	Panel data approach (2000-2020)	High external debt correlates with lower growth due to reduced investment and high servicing costs.	May not fully explore the long-term effects of debt relief and restructuring.
Jiang & Zhu (2023)	Impact of External Debt on Economic	External debt, economic growth,	Panel data approach	High external debt negatively	Might not capture dynamic

	Growth in Emerging Markets	institutional quality		affects growth, especially in countries with weak institutions.	interactions between debt, institutions, and growth.
Chowdhury (2001)	Foreign Debt and Economic Growth: A Comparative Analysis	Foreign debt, GDP growth	Comparative analysis	Bi-directional relationship between foreign debt and growth, but no causal link identified	Limited to two economies; may not generalize to other contexts
Shah & Pervin (2012	Effect of External Debt on Bangladesh's GDP	External debt, GDP, private investment	Ordinary Least Square (OLS)	Short-term positive effect of debt on GDP; debt service crowds out private investment.	May not capture long-term impacts or sector-specific variations.
Faraji & Makame (2013)	Impact of Foreign Debt and Debt Service on Tanzania's GDP	Foreign debt, debt service, GDP growth	Time series analysis	No long-term link between debt and GDP; debt service negatively impacts growth.	Did not consider effects of debt restructuring or relief initiatives.

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Zaman & Arslan (2014)	Impact of External Debt Services on Pakistan's Economic Growth	External debt services, economic growth	Empirical analysis	Positive impact of external debt services on growth; future repayment challenges highlighted.	May overlook long-term effects of accumulating debt services on future stability.
Ndebbio (2004)	Relationship Between External Debt and Economic Growth in West Africa	External debt, economic performance	Comparative analysis	Complex and varied relationship depending on country and debt management practices.	Lacks detailed examination of country-specific factors influencing the debt-growth relationship.
Addison & Hulme (2001)	Impact of Debt Relief	Debt relief, economic	Empirical analysis	Successful debt	May not fully capture the

	Initiatives on Economic Growth	growth		reduction strategies can enhance growth in low-income countries	conditionality and effectiveness of debt relief programs.
Arnone & Presbitero (2020)	Domestic Debt and Economic Growth in Low-Income Countries	Domestic debt, economic growth	Dynamic panel data approach	Moderate domestic debt positively influences growth; excessive debt hinders growth.	May not capture the impact of debt composition and effectiveness of debt management practices.
Mbate (2013)	Effects of Domestic Debt on Economic Growth in Sub-Saharan Africa	Domestic debt, economic growth	Analysis of debt management practices	Sound debt management mitigates negative impacts of domestic debt on growth.	Might not consider other institutional factors influencing debt outcomes.
Idris & Ahmad (2017)	Public Debt Borrowing and Economic Growth in Sub-Saharan Africa	Domestic debt, economic growth	Autoregressive distributed lag model	Domestic debt negatively impacts growth.	May not address heterogeneity within Sub-Saharan Africa or sector-

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					specific effects.
Putunoi & Mutuku (2013)	Domestic Debt and Kenyan Economic Growth	Domestic debt, economic growth	Engle-Granger and Johansen cointegration tests	Increasing domestic debt positively affects long-term growth.	May not account for potential crowding-out effects on private sector investment.
Maana & Owino (2018)	Kenyan Domestic Debt and Economic Growth	Domestic debt, economic growth	Analysis of historical data	Positive but statistically insignificant effect of domestic debt on growth.	Potential limitations in data or methodology; results may not be robust.
Adofu & Abula (2010)	Domestic Debt and Economic Growth in Nigeria	Domestic debt, economic growth	Empirical analysis	Negative impact of domestic debt on growth; excessive borrowing should be avoided.	May not account for potential benefits of properly managed domestic debt.
Checherita & Rother (2010)	Government Debt and Per Capita GDP Growth in	Government debt, per capita GDP growth	Empirical analysis	Non-linear negative influence of government	May not fully capture varying effects of debt

	Eurozone			debt on	across

	Countries			growth.	different Eurozone countries.
Loyaza, Fajnzylber, & Calderon (2017)	Domestic Debt and Economic Growth in Developing Countries	Domestic debt, economic growth	Empirical analysis	Moderate domestic debt can positively influence growth; high levels can be adverse.	May not account for cyclical nature of debt impacts and role of economic policy.
Panizza & Presbitero (2014)	Public Debt and Growth in Emerging Markets	Public debt, economic growth	Empirical analysis	Short-term and foreign-currency debt pose risks; long-term domestic debt is less harmful.	May not fully capture effects of global financial conditions on debt dynamics.