

PUBLIC DEBT AND UGANDA'S ECONOMIC GROWTH

CHEBET VICTORIA

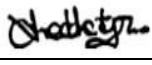
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DECLARATION

I, **Chebet Victoria**, to the best of my knowledge, solemnly affirm that the content of this research project is entirely my independent work and has not been presented to any other institution for any award.

Signature... 

Date. 24th November 2025

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APPROVAL

This research project has been presented to the Department of Applied Economics, Kenyatta University with my authorization as the university supervisor.

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DEDICATION

This research project is devoted to my father and mother for the tireless assistance they have provided me through my Master of Economics degree Programme.

ACKNOWLEDGEMENT

I would like to begin by expressing my sincere gratitude to the Supreme God for His guidance and protection during the course of developing and writing this research paper.

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ABBREVIATIONS AND ACRONYMS

| | |
|--------|--|
| ADF | Augmented Dickey Fuller |
| ARDL | Auto Regressive Distributed Lag |
| ATM | Average Term to Maturity |
| BOP | Balance of Payment |
| BOU | Bank of Uganda |
| CPI | Consumer Price Index |
| FY | Financial Year |
| GDP | Gross Domestic Product |
| LDC | Least Developed Countries |
| MoFPED | Ministry of Finance, Planning and Economic Development |
| OLS | Ordinary Least Squares |
| PFMA | Public Finance Management Act (PFMA) |
| SSA | Sub Saharan Africa |
| UBOS | Uganda Bureau of Statistics |
| US | United States |
| USD | United States Dollar |
| VECM | Vector Error Correction Method |

OPERATIONAL DEFINITION OF TERMS

Capital Formation: In this study, capital formation is measured using Gross Fixed Capital Formation as a percentage of Gross Domestic Product, representing the annual investment in fixed assets such as machinery, buildings, and equipment.

Economic Growth: This is operationalized as the annual percentage change in real Gross Domestic Product per capita for Uganda over 1993–2023.

Foreign Direct Investment (FDI): This is operationalized as net inflows of foreign investment expressed as a percentage of Gross Domestic Product per year.

Gross Domestic Savings: This refers to the difference between national disposable income and total consumption, measured as a percentage of Gross Domestic Product.

Labor Force: Labor is measured using the total labor force participation rate as reported in the national accounts and World Development Indicators.

Output: Output refers to real Gross Domestic Product (in constant prices), representing the total value of goods and services produced in Uganda in a given year.

Production Function Variables: In this study, the production function components include capital formation, labor force participation, and technology proxies, all included as explanatory variables in the ARDL model.

Public Debt: This is measured as total public debt as a percentage of Gross Domestic Product, disaggregated into external and domestic public debt components.

Trade Openness: This is measured as the sum of exports and imports of goods and services as a percentage of Gross Domestic Product.

ABSTRACT

Uganda, like many developing economies, has increasingly relied on borrowing to finance budget deficits and public investments. This growing dependence on debt has raised serious concerns about the country's long-term economic growth and debt sustainability. Existing empirical evidence for Uganda and the wider region is mixed, and often does not distinguish clearly between the roles of external and domestic public debt or between short-run and long-run effects. This study explored the correlation between public debt and economic growth in Uganda, aiming to influence the causal impact of public debt (external and domestic debt) on economic growth and assess its impact. A comprehensive evaluation of theories regarding the correlation between public debt and economic growth was carried out, focusing on both positive and negative impacts. An Autoregressive Distributed Lag bounds testing approach was since variables used were integrated of order zero and one. The model was utilized to examine the evolving connection using time series data (1993–2023). The analysis shows that although external debt and domestic debt form part of a long-term equilibrium relationship with GDP per capita as indicated by the ARDL bounds test ($F = 6.313$ above all upper critical values), neither variable demonstrates predictive causality toward economic growth when tested individually. In the short run, external debt exerts a positive and statistically meaningful effect on economic growth ($\beta = 0.1268$, $t = 2.91$, $p = 0.010$), while inflation has a weak negative influence ($\beta = -0.1604$, $t = -1.99$, $p = 0.063$). Gross domestic savings also reduce gross domestic product per capita in the short run ($\beta = -0.2291$, $t = -2.20$, $p = 0.042$), whereas trade openness positively contributes to growth ($\beta = 0.2402$, $t = 2.32$, $p = 0.033$). Other variables including domestic debt, capital formation, human capital development, and foreign direct investment do not exhibit statistically significant short-run effects. In the long run, neither external public debt ($\beta = -0.0289$, $t = -0.91$, $p = 0.377$) nor domestic public debt ($\beta = 1.0727$, $t = 1.59$, $p = 0.130$) exhibits a statistically significant effect on real gross domestic product per capita. By contrast, gross domestic savings show a weak but negative association with economic growth ($\beta = -0.2373$, $t = -2.00$, $p = 0.062$), while trade openness exerts a positive and statistically significant long-run effect ($\beta = 0.2488$, $t = 2.20$, $p = 0.042$). However, most control variables are individually insignificant. Based on the findings, the study concludes that external debt supports economic activity only in the short run, while neither external nor domestic debt has a meaningful long-run effect on Uganda's economic growth. Long-run performance is instead shaped more by structural factors such as domestic savings which exert a negative influence and trade openness, which consistently promotes higher gross domestic product per capita. Based on these findings, the study recommends that government priorities productive external borrowing, strengthen policies that deepen export competitiveness, and reform domestic savings mobilization to ensure savings are channeled toward investment rather than consumption. Strengthening debt management and enhancing the efficiency of public investment will also be essential for sustaining long-term economic development.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Throughout 1970s and 1980s, economic shocks in the world, that is; interest rates, distress of oil prices, economic recessions and delicate input prices of commodities in developed countries were the major contributors to the increase in debt in the low developing economies. External debt crisis in Latin America and Africa Sub Saharan is not yet over (Manasseh et al., 2022). In Sub Saharan Africa most of the countries have adopted finance and development strategies that heavily depend on debt financing while considering domestic and external sources. Most of the developing countries therefore started borrowing massively during the 1970s and 80s to facilitate their developmental projects, reduce high poverty rates and to increase the growth of their economies (Onyango, 2025).

Abanikanda, Dada and Ogunjumo (2023) claims that by the late 1970s, most Sub-Saharan African (SSA) countries went into financial crises which resulted in largely unmanageable fiscal deficits, though at that time deficits were considered normal and hence continuous borrowing was encouraged. Many countries in SSA have incurred huge debts and are besieged with the ever-growing debts that their economies are forced to incur as a way of sparking off economic growth. For example, Uganda has a low income per individual leading to inadequate savings, low investment levels and low tax revenue collected. This has pushed her into incurring extremely high debts that are not sustainable. On the other hand, these developing countries export raw materials and primary goods with low market prices compared to their expensive imports and this has kept most of them in a current account deficit. In a bid to close the expenditure-revenue gap, these countries end up borrowing, especially from foreign countries.

Across the East African Community, Uganda's public debt indicators broadly mirror those of its peers, although the pace and structure of borrowing differ across countries. Comparative reports by the International Monetary Fund (International Monetary Fund, 2023) and the East African Community (East African Community, 2023) show that Kenya has tended to carry a higher debt-to-GDP ratio, driven largely by commercial and infrastructure-related borrowing, while Tanzania and Rwanda have maintained relatively lower but steadily rising ratios anchored mainly on concessional flows. Uganda falls between these extremes, with a debt burden that is significant

but still within regional convergence thresholds, though its growing reliance on domestic securities has raised concerns about interest costs and crowding out of private credit.

In Kenya, public debt as a ratio of Gross Domestic Product (GDP) was at its peak in 2000 when it reached 78 percent of GDP. Nevertheless, attempts were undertaken and it was lowered gradually to 39 percent by the end of 2012. Kenya's public debt has since gradually rose at a recorded ratio of 62.1% in 2019 and up to Ksh 10,278,673 million (70.8% of the GDP) by the close of June 2023, from Kenyan Shillings (Ksh) 8,634,909 million in June 2022 (Republic of Kenya, 2023). Focusing on Tanzania, the country's debt to GDP levels have similarly witnessed significant interruptions throughout the recent years. The maximum degree that was documented there was in the year 2000 when the public debt to GDP levels reached the 50 percent mark. The country endeavored to lower this steadily to a level of 22 percent by the end of 2008. However, since 2008, the extent of debt to GDP have been on a steady rise to a level of level 37.5 percent in 2018 and up to 43.8 percent of GDP in the 2021/22 financial year from 41.3 percent recorded in the 2020/21 financial year (International Monetary Fund, 2023).

Uganda, in particular, has worked for economic stability since achieving independence, through government and central bank-led initiatives, notwithstanding the fact that persistent patterns of trade deficits and slow GDP growth persist. The government of Uganda has been unable to service its debt, which was incurred to finance the upkeep and expansion of domestic infrastructure and government-sponsored social programmes (Ministry of Finance, Planning and Economic Development, 2018), due to a combination of low local savings and volatile conditions in the global market. According to a report by Ministry of Finance, Planning and Economic Development (2018) and Uganda Bureau of Statistics (2018), the nominal measure of the economy for the 2018/19 fiscal year was estimated to be 109,945 billion Ush. The services sector contributed the most at 53.3%, followed by agriculture at 20.6% and industry at 18.8%. The economy grew by 6.1% in FY 2018/19, 0.1% points less than the amended growth rate of 6.2% in FY 2017/18. The greatest increase in the rate of growth was registered in the services sector. This was, however, lower than the 7.8% growth that was revised for FY 2017/18. The expansion of the industry sector was 5.8%, which is less than the 6.1% expansion in FY 2017/18. Industry sector recorded growth of 5.8%, which is also less than the 6.1% expansion in FY

2017/18. The agricultural, forestry, and fishery industries expanded by 3.8%, the same rate as in FY 2017/18.

The decline in GDP growth to 3.9 percent in FY 2016/17, following prolonged drought, was followed by a recovery in FY 2017/18 as agricultural output improved and overall economic activity strengthened. According to the Ministry of Finance, Planning and Economic Development (2018), the rebound was supported by improved weather conditions, stable monetary policy, increased foreign investment, and ongoing government expenditure on infrastructure. During this period, the services sector expanded, and private sector credit grew steadily, reflecting improved domestic economic conditions. However, growth softened again in FY 2018/19 due to weaker external demand and modest domestic activity, highlighting the vulnerability of Uganda's growth path to both domestic and global shocks.

Over the recent period, Uganda's growth performance has been moderate but uneven. According to the Uganda Bureau of Statistics (Uganda Bureau of Statistics, 2023), real GDP growth slowed during the 2016/2017 and 2017/2018 financial years owing to adverse weather and global shocks, before recovering in subsequent years as agriculture and services rebounded. By 2021/2022 and 2022/2023, the economy was expanding again, supported mainly by the services sector, which consistently contributed the largest share to GDP, followed by industry and agriculture. Over the same period, the public debt-to-GDP ratio has continued to rise as government financed infrastructure and recurrent spending through both external and domestic borrowing, raising questions about whether this debt accumulation is compatible with sustaining the observed growth path. Further details are as indicated in figure 1.1 below.

Trend analysis on the other hand indicate that the public debt reached approximately 49.8 trillion UGX by the end of the fiscal year 2018/19, growing by 11.5% from the previous year. Before the completion of the fiscal year 2019/20, the debt burden had climbed to 56 trillion UGX, representing 50.1% of GDP. In the subsequent years, the debt continued to rise, reaching an estimated 63.5 trillion UGX before the completion of the fiscal year 2020/21, equating to 52.4% of GDP. The most recent data indicates that as of the completion of the fiscal year 2021/22, Uganda's public debt stood at approximately 72 trillion UGX, which is about 54.9% of GDP. Projections for 2023 suggest that the public debt may surpass 80 trillion UGX, reflecting ongoing fiscal pressures and economic challenges.

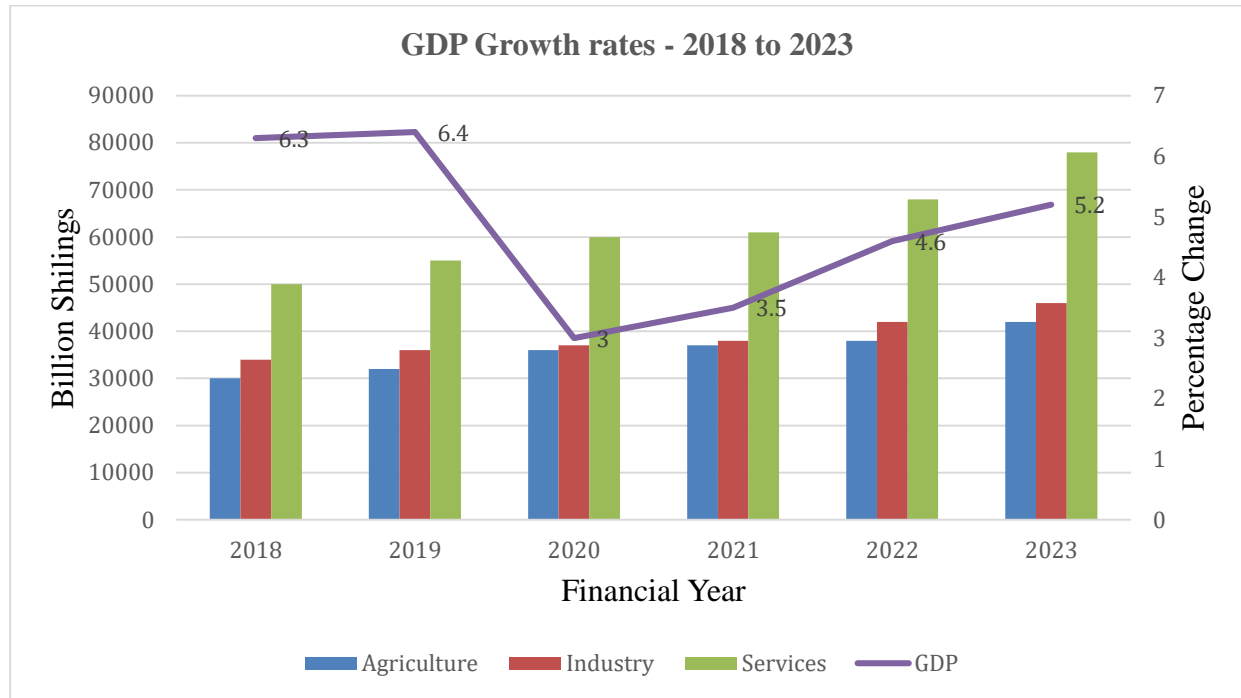


Figure 1.1: Real GDP Growth Rates: Financial Year 2017/18-2022/23

Source: Uganda Bureau of Statistics, 2023

Based on the data documented in the Ministry of Finance, Planning and Economic Development reports and consolidated financial statements, the increase can be attributed to a shortfall in funding from securities amounting to Shs 1.7 trillion, as well as expenditures directed towards investments in infrastructure initiatives within the transportation and energy domains. The escalating accumulation of debt is expected to ultimately result in a state of unsustainable debt.

Debt of the country in relation to its GDP was 41.3 percent at the end of FY 2017/18 (US\$ 11.3 billion). Debt of the total public sector is equal to 31.3 percent of GDP in current value terms. Approximately US\$7.9 billion in public debt is due to non-resident creditors on a residency basis, with the majority of this money going towards financing energy and infrastructure projects (Ministry of Finance, Planning and Economic Development, 2018). About three-quarters of this total (\$3.5 billion) is denominated in Treasury bonds, while the remaining (\$1.1 billion) is denominated in short-term Treasury bills. Baseline projections of public debt as a proportion of GDP remain below average. Seeing that oil export revenues rise, public debt is projected to reach a high of about 39.3% of GDP in FY 2023/24 before gradually declining to 29.9% in FY

2028/29.9. To put this in perspective, a healthy debt-to-GDP ratio for a country is around 70%. The stock of public debtor in Uganda rose starting at USD 20.99 billion in the 2021/22 financial year to USD 23.66 billion in 2022/23 financial year. External debt climbed to USD 14.24 billion in 2022/23 financial year from USD 12.82 billion registered in the 2021/22 financial year. Conversely, domestic debt recorded in the 2021/22 financial year was USD 8.16 billion and this rose to USD 9.43 billion in the 2022/23 financial year. As a proportion of GDP, public debt declined from 48.4% in the 2021/22 financial year to 46.9 percent that was recorded in the 2022/23 financial year. Concerning domestic and external debt, domestic debt contributed 18.7 percent of GDP while foreign debt accounted for 28.2 percent of GDP in the 2022/23 financial year (Ministry of Finance, Planning and Economic Development, 2023).

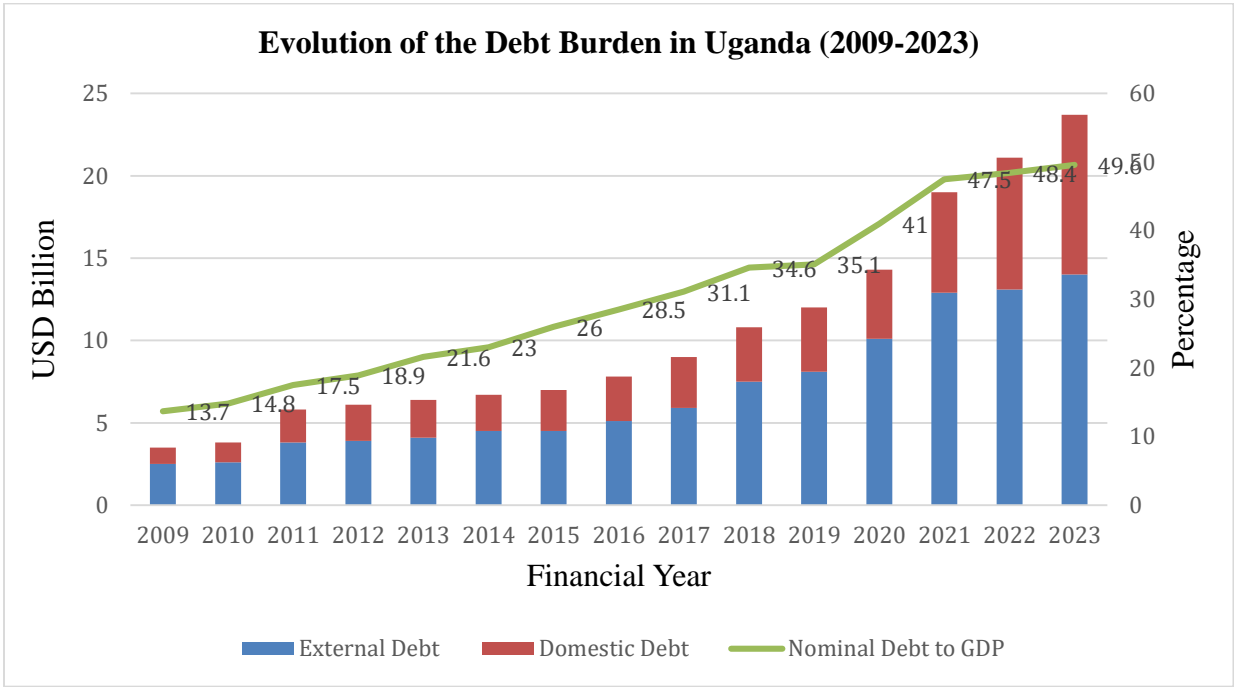


Figure 1.2: Evolution of the Debt Burden in Uganda (2009-2023)

Source: Ministry of Finance, Planning and Economic Development (2023)

Figures 1.1 and 1.2 clearly show that while Uganda’s GDP growth fluctuated between 2.9 percent and 6.4 percent during FY 2017/18–2022/23, public debt rose sharply over the same period. For instance, GDP growth slowed to 2.9 percent in FY 2020/21 due to COVID-19 disruptions, yet total public debt continued increasing, reaching approximately USD 20.99 billion in FY 2021/22 and USD 23.66 billion in FY 2022/23. Even in years of improved economic performance such as the recovery to 5.5 percent growth in FY 2022/23, the debt stock

still expanded, with external debt climbing from USD 12.82 billion (2021/22) to USD 14.24 billion (2022/23) and domestic debt rising from USD 8.16 billion to USD 9.43 billion in the same period. This consistent upward trajectory of debt compared to the cyclical behavior of GDP growth underscores the core motivation of this study: Uganda's debt has been growing faster and more steadily than its economic output, raising sustainability concerns and justifying empirical investigation into the debt–growth relationship.

The government has been spending an average of 78.5% of its budget on interest payments every year. According to Ministry of Finance, Planning and Economic Development (2023), total interest payments per share of the Gross Domestic Product rose from three percent during the 2021/22 fiscal year to 3.8 percent in the 2022/23 financial year. This was a result of a significant increase in the domestic debt stock and commercial external borrowing, both of which feature high interest rates. Domestic interest payments continue to occupy the majority of interest payments due to the high cost of issuance associated to them, compared to external interest payments which are primarily concessional rates. Debt managers, advisors, and policymakers need to take notice, since rising costs like these divert money and attention away from meeting residents' social and recurring economic demands.

Medium-term policy measures, such as increased income mobilization and longer-than-average maturities for domestic debt, have been implemented. Parliament is tasked with weighing the fiscal impact of proposed budgets, giving the green light to acquire external finance, and keeping an eye on how it's being spent, as per the Public Finance Management Act (2015). However, audit reports suggest that almost no loans are technically reviewed, and if this trend continues, the government might face a financial catastrophe. Consequently, this research aims to analyze how Uganda's public debt affects the country's GDP.

1.2 Statement of the Problem

Uganda, like many developing economies, has increasingly relied on public borrowing to finance budget deficits and scale up investment in infrastructure and social services. Over the last decade, this has led to a rapid build-up of both external and domestic public debt, accompanied by a rising debt-service burden. Recent budget documents show that in the 2022/2023 financial year, interest and principal repayments on public debt absorbed about 12.4 per cent of the

national budget, thereby reducing the fiscal space available for growth-enhancing expenditure in sectors such as agriculture, industry, health and education. At the same time, real GDP growth has remained moderate and volatile, raising concerns about whether the current level and composition of public debt are compatible with Uganda's development aspirations.

Despite these trends, there is limited empirical evidence on how public debt actually affects economic growth in Uganda, particularly when external and domestic components are distinguished. Much of the existing literature on the debt–growth nexus is based on cross-country studies that may not capture Uganda's specific institutional, structural and macroeconomic conditions (Mhlaba & Phiri, 2019; Wu, Zhong, & Wu, 2021; Yusuf & Mohd, 2021). Moreover, the few country-level studies that exist often treat public debt as an aggregate and do not jointly examine its dynamic relationship with other macroeconomic variables over time (Ssempala et al. 2020). Consequently, policymakers lack context-specific evidence on whether external and domestic debt have different implications for growth, and on the extent to which current debt dynamics pose a risk to long-term economic performance. This study therefore seeks to fill this gap by analyzing the relationship between public debt and economic growth in Uganda.

1.3 Research Questions

- i) What is the impact of external debt on the economic growth of Uganda?
- ii) What impact does domestic debt have on Uganda's economic growth?

1.4 Objectives of the Study

The primary aim of this research was to analyze the effect of public debt on Uganda's economic growth.

1.4.1 Specific Objectives

- i) To assess the impact of external debt on the economic growth in Uganda.
- ii) To assess the impact of domestic debt on the economic growth in Uganda.

1.5 Significance of the Study

- i) The findings provide Uganda-specific empirical evidence on the relationship between public debt and economic growth, distinguishing between external and domestic debt and using a modern time-series framework. In doing so, the study adds to the existing body of

knowledge on the debt–growth nexus by offering disaggregated and up-to-date evidence for a developing economy context that is under-represented in the literature.

- ii) The results will be useful to policy makers in the Ministry of Finance, Planning and Economic Development, the Bank of Uganda and other government agencies in designing borrowing strategies, debt-management policies and growth-oriented fiscal frameworks that balance the need for financing with concerns about sustainability.
- iii) The study also provides a methodological and empirical reference point for researchers and students interested in public debt and macroeconomic performance in Uganda and similar economies, thereby informing future research and comparative studies.

1.6 Scope of the Study

The research endeavored to set up if and how public debt in Uganda had affected the country's economic development. Over the study's time frame (1993-2023), the impacts of both internal and external loans on Uganda's economic growth were evaluated. Additionally, the study identified policy actions to minimize the risks related to increased public debt. The scope was limited to Uganda, located in East Africa.

1.7 Justification of the study

In recent decades Uganda has witnessed a significant rise in its levels of public debt, which consists of both foreign and local debt. It is crucial to comprehend the composition and trends within these debt categories to formulate effective economic policies. The country has sought financial support from international financial institutions and bilateral partners to fund crucial development projects. However, the continuous growth in external debt raises concerns about its impact on economic growth and sustainability. Simultaneously, the government's reliance on domestic borrowing tools like bonds and treasury bills has implications for monetary policy and market dynamics. A thorough examination of these dynamics was necessary for a comprehensive understanding of the economic consequences.

1.8 Organization of the Study

This research was divided into five chapters: Chapter One introduced the research by outlining the background, problem statement, research questions, objectives, scope, and significance. Chapter Two reviewed relevant literature, while Chapter Three described the research

methodology. Chapter Four presented and analyzed the results. Lastly, Chapter Five summarized the key results, provided conclusions, and offered recommendations for policy and future studies.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter depicts theoretical literature, empirical literature, related to the influence of domestic debt on Uganda's economic growth and the overview literature concerning the influence of Uganda's foreign debt on economic growth.

2.1 Theoretical Literature

As indicated in the background, economic growth is a highly multifaceted phenomenon predisposed by various and diverse factors including political, social and cultural factors. Thus, an analysis of economic situation can deliver only a partial elucidation of economic development which rely mostly on social attitudes, human benefactions, historical accidents and political stability. Capital investment is essential but not an adequate requirement of progress. Several theories have been put forward to describe economic growth and the factors that support growth. The convergence proposition holds true when two economies have the same constant state of growth but deviation is different, allowing countries with small capital stocks to grow faster. This school of thought considers the households' consumption expenditure for an entire life cycle and argues that tax burden is moved by the government with a budget deficit to the next generations resulting in a rise in current consumption.

2.1.1 Debt Overhang Theory

The Debt Overhang Theory, as suggested by Krugman (1988), holds significant relevance in examining the impact of public debt on the economic growth of Uganda. In accordance with this theory, when a country's debt exceeds its potential to cover servicing costs, it can hinder the attraction of both foreign and domestic investments. Igudia (2021) noted that when a nation accumulates substantial debt, a significant portion of its financial resources must be allocated to debt servicing rather than productive investments in infrastructure, education, healthcare, and other critical sectors. This diversion of funds can hamper economic development by limiting the government's ability to stimulate growth through public spending initiatives.

The crucial connection between this theory and the present study lies in how high public debt could potentially affect Uganda's investment climate. If Uganda's public debt becomes

burdensome to service, it has the potential to discourage both domestic and foreign investors from participating in productive initiatives. Following Krugman's theory, the anticipated return on such investments may be perceived as insufficient to offset the economic risks associated with the substantial debt burden. As a result, this could lead to a decline in both domestic and international investments, thereby constraining economic development. Moreover, Debt Overhang Theory highlights the potential adverse effects on private sector investment. Heightened sovereign debt levels can raise concerns among investors about the country's financial stability, leading to increased borrowing costs and reduced willingness to invest in new businesses and projects (Kose, Ohnsorge, & Sugawara, 2020). This phenomenon can create a challenging economic environment, hindering job creation and overall economic expansion. Therefore, maintaining manageable levels of public debt and implementing effective debt management strategies are essential for Uganda to foster a favorable investment climate that supports entrepreneurship and economic diversification.

Debt overhang theory is not without criticism. Bolton (2020) alludes that the theory may oversimplify the complex correlation involving public debt and economic growth by focusing mainly on the negative effects of debt accumulation. He argues that not all types of public spending financed by debt are detrimental to growth; investments in productive infrastructure or social programs can yield positive long-term economic benefits. Additionally, the theory's predictions may not always hold true in real-world scenarios, as the impact of public debt can differ significantly based on various factors such as the structure of the economy, institutional quality, and external economic shocks (Can & Bağdadioglu, 2021). Therefore, effective governance mechanisms are essential to ensure that Uganda uses its resources in the best interests of its citizens, fostering sustainable economic growth despite high public debt.

The incorporation of this theory into the current study allows researchers to evaluate how the level of public debt influences investment patterns, considering both quantity and quality. The theory's contribution lies in providing insights into the mechanisms through which high public debt might hinder economic development by restricting investment. This, in turn, informs policymakers about the potential risks associated with unsustainable debt levels, assisting in the formulation of effective economic strategies. Essentially, the Debt Overhang Theory serves as a

perspective through which the study can scrutinize and interpret the correlation involving public debt and economic growth in the specific framework of Uganda.

2.1.2 Dependency Theory

The dependency theory in 1960s and 1970s, gained popularity as a modernization theory critique, which was developed around 1950. Principal advocates of this theory include Prebisch, Singer, Bill Warren, Paul Baran, Girvan, Paul Sweezy, C. Furtado, F. H. Cardoso, A. Gunder Frank and Gunnar Myrdal.

According to dependency hypothesis, as opposed to what is typically asserted by free market economists, poor peripheral nations are poor because of disregarding how they are incorporated into the global systems (Hariss, 1995). The objective of the dependence theory is to pinpoint reasons of underdevelopment in a country. According to proponents of this idea, affluent nations benefit themselves at the expense of less developed states in the form of a "core" that receives resources from the periphery. According to the dependence hypothesis, when underdeveloped countries join the global economy, the developed world benefits at the expense of the poor nations because of the undeveloped countries relying on the developed nations in almost every way, including science, aid, technical help, culture, and more. Most developing nations cannot compete with the goods produced in the developed world and backed by the Breton Woods institutions because of their dependence on them (Ajayi & Khan, 2000). The dependence hypothesis provides a comprehensive explanation for why developing nations are in the position they are, and why they must depend on the developed world for their economic prosperity.

In the context of Uganda's economic expansion and public debt, the Dependency Theory helps in understanding the dynamics of how external factors, such as global financial institutions and developed nations, may impact the economic development of Uganda. The theory suggests that there might be asymmetrical power relations between Uganda (as a developing nation) and the developed world, especially if the country is heavily reliant on foreign aid, loans, or technical assistance. This theory offers a lens through which to analyze whether the public debt incurred by Uganda contributes to its economic growth or perpetuates dependency on external actors. It implies that the economic prosperity of Uganda may be influenced by the terms and conditions associated with the public debt, as well as the broader global economic context.

Dependency theory, despite its widespread use, has faced a number of criticisms based on the fact that it focuses too much on external factors and depicts developing nations as helpless victims (Cramer, et al., 2020). Critics argue that this view makes it more simplistic, overlooking the complications within countries and the potential benefits of global trade, such as access to new technology and investment. Additionally, policies derived from dependency theory, like trying to reduce reliance on foreign goods, have sometimes led to inefficiency and slow growth and hence critics suggest that they should consider both internal and external factors (Cardoso & Faletto, 2024). However, despite all this criticisms Dependency theory remains a valuable framework for understanding the function of debt in Uganda's economic growth.

By incorporating the dependency theory into the study, researchers can gain insights into the structural inequalities and power dynamics that may shape Uganda's economic growth during the presence of public debt. This theory offers a thorough framework to identify the underlying causes of underdevelopment, shedding light on how the global economic system may impact Uganda's position within it. The dependency theory contributes by offering a theoretical foundation to explore whether public debt in Uganda serves as a tool for economic development or perpetuates a cycle of dependency. It allows researchers to analyze the extent to which Uganda's integration into the global economy influences its economic policies, trade correlations, and overall development trajectory (Arčabić et al., 2018). Therefore, this theory enhances the study's ability to uncover nuanced comprehension of the connection involving public debt and economic growth within the particular framework of Uganda.

2.1.3 Balanced Growth Theory

Nurkse (1959), in his balanced growth theory, suggested that governments should do everything possible to acquire capital including incurring debts in order to make huge investments. In particular, the growth of economies in developing nations is affected by both the beneficial and detrimental effects of their external debt. When used for investment-driven initiatives like electricity generation and supply, infrastructure, education, health, and agricultural output, external debts can have a favourable impact. However, it would have an adverse effect when used for nonproductive ends like public and private consumption. In addition, Reinhart and Rogoff (2010) found that positive association exists between economic development and low level of debt, but that this correlation turns negative at a larger level of debt. By separating the

repercussions of excessive debt burden and debt crowding on the Solow growth model, we can better understand the general impact of public debt with this model. Therefore, the study utilized the aforementioned theoretical frameworks to analyze how rising government debt has affected the economy of Uganda.

Critically examining the balanced growth theory reveals several important limitations and challenges. Although Nurke's proposition to leverage external debt seemed promising, one major critique to that suggestion was that the advocacy for extensive borrowing without sufficient consideration of debt sustainability is simply reckless. In practice, unchecked accumulation of foreign debt can lead to debt overhang and potential default risks, undermining economic stability rather than bolstering growth (Akcigit & Ates, 2021). Yusuf and Mohd (2023) further add that empirical findings, such as those by Reinhart and Rogoff, emphasizes the nonlinear correlation between debt levels and economic performance, suggesting that beyond a certain threshold, high debt burdens can be detrimental rather than facilitate growth. These critiques highlight the need for a more refined understanding of debt's role in development, considering factors beyond mere capital accumulation, such as institutional quality, governance frameworks, and the structural transformation of economies. Thus, while the balanced growth theory offers valuable insights, its application must be reviewed with a comprehensive assessment of the broader economic context and the sustainability of debt dynamics.

The balanced growth theory is pertinent to this study as it underscores the need to maintain equilibrium across various economic sectors for sustainable development. Within the framework of the study's objectives, this theory highlights the significance of assessing both external and domestic debt's causal associations with economic growth in Uganda. By considering the interconnected effects of these debt types, the study aligns with the balanced growth perspective, providing a comprehensive understanding of how public debt dynamics can impact the overall economic health of Uganda.

2.1.4 Neoclassical Growth Theory

According to the theoretical evidence on the subject, public debt is typically viewed as having serious unfavorable effects on economic growth. For instance, in a neoclassical context, growth models that include the issuance of debt by public agents to facilitate financing of consumption

or capital products are likely to demonstrate an inverse interconnection between growth of an economy and public debt.

Refining the Buchanan (1958) and Meade (1958) analogy, Modigliani (1961) claimed that future generations would be harmed by the national debt because of the decreased income that would result from a lesser stock of private capital. The author posited that, "...in the event of a substantial government operation, there is a possibility of a notable increase in interest rates in the long run owing to decreased private capital, which could potentially lead to an amplified marginal product. This, in turn, may result in a non-linear impact on interest rates in the long term" (p.739). Despite the implementation of national debt as a counter-cyclical strategy and the adoption of an extremely accommodative monetary policy with interest rates pushed to their lowest attainable level, it is important to acknowledge that future generations inevitably shoulder a portion of the associated costs, albeit not immediately experienced.

Modigliani argued that future generations' income may be bolstered by government spending on things like productive public capital construction, which could help alleviate some of the burden of the country's overall gross debt. In addition to defining the differences between external and internal public debt, Diamond (1965) considers impact of taxes regarding the stock of capital. Diamond draws the conclusion that taxpayers' ability to consume and save throughout their lives is diminished by the presence of either sort of public debt due to the tax revenue needed to maintain the interest payments. It is further argued that internal debt can lead to capital stock reduction since investors shift their holdings from physical to paper assets (Modigliani, 1961).

Adam and Bevan (2005) concluded that when the debt level of a country is already high, negative consequences of budget deficits are amplified. A simplified theoretical model that incorporates limitations in terms of debt financing and government budgeting, demonstrates a rise in productive spending by the government paid by a hiked tax rate promotes growth, provided the quantity of (domestic) public debt remains at a satisfactory extent. Public debt growth may be felt primarily through increases in long-term interest rates. If the government expands its budget deficits by borrowing money, rising long-term interest rates can deter private investment and hinder economic growth. However, if higher rates on sovereign debt result from rising public financing needs, the fund's net flow from private sector into public sector could increase.

It's possible that this phenomenon may lead to higher borrowing rates in the private sector, which would reduce expenditure by individuals and businesses. Various inferences can be made from extant empiric research investigating the long-run connection between interest rates and public debt. However, a substantial amount of recent research demonstrates that higher levels of debt and deficits may bring about a rise in sovereign interest rates relating to the long run and generate spreads. Krugman discovered that an elevated level of external debt overhang reduces private investment. For this reason, domestic and foreign investors see less value in contributing to the economy. There are other factors that need to be considered, such as aggregate productivity as advanced by Patillo et al. (2004) and increasing uncertainty regarding policy decisions to come. Agenor and Montiel (1996) found that the latter was bad for investment and, by extension, economic development. This finding accords with the state of the art in the study of decision making in the face of uncertainty, whereby the downsides of making judgments that are at least partially irreversible are emphasized (Dixit & Pindit, 1994).

Comprehending bidirectional causation in this scenario is essential for a comprehensive analysis of economic growth dynamics (Azolibe, 2023). It shows the significance of considering feedback effects when designing policies and modeling economic dynamics. This approach enables a more in-depth and a practical comprehension of economic growth processes. A majority of economic variables interact in a manner that is bidirectional. As posited by Sani et al. (2019), in the case of public debt and economic growth, strong and solid economic growth increases government revenues, thereby lowering the need for borrowing. On the other hand, government borrowing can finance public investments that enhance growth. However, when debt becomes excessive, it can hinder growth by crowding out private investment or resulting to higher taxes and interest rates.

Neoclassical Growth theory faces several criticisms. Critics argue that its view of public debt's impact on economic growth is overly simplistic, failing to account for scenarios where public debt finances productive investments that can boost future growth. The theory's heavy emphasis on capital accumulation overlooks other important factors like human capital, institutional quality, and innovation. By treating technological progress as exogenous, it fails to explain the underlying mechanisms driving advancements (Sredojevic et al., 2016). The assumption that markets always allocate resources efficiently is questioned due to real-world market

imperfections. While acknowledging the economic load of public debt on future generations, the theory might not completely encompass the complexities of intergenerational equity, especially regarding productive government spending. Additionally, the policy implications, such as reducing public debt to foster growth, may not always be practical, especially during economic downturns. The theory often neglects external influences such as global economic conditions and trade dynamics, oversimplifies the correlation involving public debt and interest rates, and underestimates the role of uncertainty in economic decision-making (Cvetanovic, et al., 2019).

The neoclassical growth theory is applicable to the study as it posits that the key determinants of economic growth are capital accumulation, technological progress, and efficiency in distribution of resources. Within the framework of the research, analyzing the effect of public debt on Uganda's economic growth aligns with the neoclassical perspective by exploring how debt levels may affect capital formation, productivity, and the efficient allocation of resources. By evaluating the influence of public debt on these fundamental growth factors, the study contributes to understanding how neoclassical principles apply to Uganda's economic dynamics.

2.2 Empirical Literature Review

This section addresses the causal connection regarding economic growth and public debt. It also synthesizes studies evaluating the consequences of public debt for an economy's growth. Debate about the soundness of Reinhart and Rogoff (2010) findings on the ratio of debt to GDP persists. Rahman, Ismail and Bidabad (2019) conducted a systematic review and meta-analysis of empirical studies on public debt and economic growth across both advanced and developing countries. Using publications identified through the PRISMA protocol, they compiled 93 studies that mainly relied on panel and time-series data covering different periods from the 1970s onwards, with real GDP growth as the dependent variable and alternative measures of public debt-to-GDP, interest payments and debt thresholds as key regressors. Most of the underlying studies employed linear or nonlinear regression models, including fixed-effects panels, VAR and threshold models. Rahman et al. found no universal debt threshold beyond which growth always declines; instead, the sign and magnitude of the debt coefficient varied substantially with country group, period, model specification and control variables. Their main conclusion is that the debt–growth relationship is context-specific and that mechanical application of “one-size-fits-all”

thresholds such as 90 per cent of GDP is not empirically justified, a result that motivates country-specific analysis such as the present study for Uganda.

Hassan and Tahmina Akhter (2016) examined the impact of public debt on economic growth in Bangladesh using annual time-series data from 1980 to 2010. Real GDP was modelled as a function of total public debt, government expenditure and private investment, with all variables expressed in real terms. The authors applied Johansen cointegration and vector error correction techniques to capture both long-run relationships and short-run dynamics. Their results show a statistically significant positive long-run association between total public debt and output, suggesting that borrowing in Bangladesh has financed productive investment; however, domestic debt was found to have a weaker and sometimes negative correlation with growth compared to external debt. A limitation of this study is that it does not explicitly control for other macroeconomic factors such as inflation, trade openness or human capital that may jointly influence growth, which restricts the ability to isolate pure debt effects.

Mhlaba and Phiri (2019) analysed the relationship between public debt and economic growth in South Africa using quarterly data for the period 2002Q1–2016Q4 obtained from national fiscal and macroeconomic statistics. Their empirical model specified real GDP as a function of public debt, gross fixed capital formation, government consumption and a set of control variables, and employed the Autoregressive Distributed Lag (ARDL) bounds-testing approach to distinguish short-run and long-run effects. The findings indicate that increases in public debt are associated with higher economic growth in the long run, particularly in the post–global financial crisis period, while short-run effects are more volatile and sometimes negative. The authors argue that the growth-enhancing impact reflects the use of debt to finance infrastructure and social spending, but they also caution that rising debt service costs could eventually offset these gains. Their single-country ARDL framework is methodologically close to the approach used in this Ugandan study, but it does not differentiate between external and domestic debt, leaving open the question of whether different debt components have distinct effects.

Asteriou, Pilbeam and Pratiwi (2021) investigated the asymmetric effects of public debt on economic growth across 14 Asian countries using an extensive panel dataset (1980–2017) sourced from the World Bank and IMF. Their model specified GDP growth as a function of public debt, investment, trade openness and human capital, and employed both the Pooled Mean

Group (PMG) estimator and the Common Correlated Effects (CCE) estimator to correct for cross-sectional dependence, country-specific heterogeneity and endogeneity concerns. The findings reveal a clear negative long-run effect of public debt on economic growth, alongside strong evidence of asymmetric adjustment—meaning that increases in public debt reduce growth more sharply than debt reductions enhance it. Although the study offers advanced methodological treatment of cross-country differences, its pooled nature masks country-specific institutional characteristics; thus, the Ugandan context, where domestic and external borrowing have evolved differently, merits a separate country-level analysis.

Jacobs, Ismail and Bidabad (2020) conducted a panel vector autoregression (PVAR) analysis covering 32 EU and OECD countries to study the dynamic interaction between GDP growth, real interest rates and the public debt-to-GDP ratio over several decades. Using standardised macroeconomic indicators, they modelled feedback relationships among the three variables while allowing for country-fixed effects. Their results indicate that higher long-term real interest rates increase the public debt burden, which in turn places downward pressure on economic growth through interest-service constraints. However, the authors also found that moderate rises in government debt can support growth in countries with strong institutions and productive expenditure patterns. The study's strength lies in its dynamic modelling of bidirectional effects, although its conclusions are more relevant to advanced economies with stable monetary frameworks; Uganda's debt dynamics, driven by concessional borrowing and volatile domestic interest rates, require more context-specific evidence.

Atapattu (2020) examined the macroeconomic effects of public debt in Sri Lanka using 69 years of quarterly data (1950–2019), estimating debt–growth relationships through a set of Autoregressive Distributed Lag (ARDL) and Error-Correction Models (ECM). Public debt was disaggregated into domestic and external components to assess differential impacts. The results show that external debt has a significant negative effect on GDP in both the short and long run, while domestic debt exerts mixed effects positive during periods of productive public investment but negative when domestic borrowing competes with private credit. The study highlights Sri Lanka's vulnerability to rising interest payments, exchange-rate pressures and the “debt overhang” problem. While methodologically rigorous, its macro-structural context including

persistent balance-of-payments constraints, differs from Uganda's mix of concessional debt and moderate domestic borrowing, reinforcing the need for country-specific empirical investigation.

Qossofw and Oqouab (2019) analysed the interactions between public debt, foreign direct investment and output expansion in five Caribbean economies using annual data from 1975 to 2015 obtained from World Bank and IMF sources. Their model specified real GDP as a function of public debt, FDI inflows, trade openness and human capital, and they employed a battery of time-series panel techniques including unit-root tests, cointegration tests and a generalized forecast error variance decomposition (GFEVD) framework to assess dynamic linkages. The results show that public debt, FDI and growth are cointegrated, with debt exerting a negative long-run impact on output once FDI and openness are controlled for, while FDI contributes positively to growth. The study concludes that crowding-out effects and rising debt-service costs weaken the growth benefits of external financing. However, because the analysis pools structurally different small island economies, the estimated elasticities may not easily generalize to landlocked, low-income countries such as Uganda.

Ssebulime, Ssebulime and Twimukye (2020) provided one of the few Uganda-specific empirical assessments of the debt–growth nexus. Using annual time-series data for Uganda spanning several decades (1970s–2016), they modelled real GDP growth as a function of public debt, interest payments, investment and other macroeconomic controls, and estimated both ARDL bounds models and error-correction specifications. Their findings indicate that total public debt has a negative and statistically significant relationship with economic growth, largely driven by interest-payment obligations and the composition of external borrowing, whereas some components of domestic debt appear less harmful. While this study offers valuable country evidence, it treats public debt in an aggregate form in most specifications and does not explore the separate roles of external versus domestic debt or incorporate broader structural variables such as human capital and savings, gaps that the present study addresses.

Yusuf and Mohd (2021) focused on Nigeria, examining how public debt affects economic growth using annual data for 1980–2018 drawn from the Central Bank of Nigeria and World Development Indicators. Their empirical model related real GDP to external debt, domestic debt, debt-service payments, inflation and investment, and was estimated using the ARDL cointegration approach to capture both short-run and long-run dynamics. The results show that

external debt initially appears to support growth when used to finance investment, but high and persistent levels of both external and domestic debt eventually exert a negative long-run effect on output, particularly through rising interest payments and crowding out of private investment. The authors recommend prioritizing domestic revenue mobilization and improving the efficiency of borrowed funds. A limitation, however, is that institutional quality and governance factors (important for explaining how debt is used) are not explicitly modelled.

2.3 Overview of Literature

The reviewed theoretical and empirical literature shows that public debt can influence economic growth in two opposing ways. On one hand, traditional and neoclassical theories argue that borrowing can enhance growth when resources are channeled into productive investment that raises capital formation and productivity. On the other hand, these theories also warn that when debt accumulates rapidly and servicing costs become high, public debt can constrain growth by diverting revenue away from development expenditure and undermining macroeconomic stability. Empirical evidence across developed and developing countries reflects this duality: some studies report growth-enhancing effects through infrastructure financing and capital accumulation, while others find negative outcomes associated with debt overhang, high interest burdens and crowding out of private investment, with the overall impact depending on the composition of debt, servicing costs and the quality of fiscal management.

Regional literature from Africa adds another layer of complexity by highlighting structural vulnerabilities such as exchange-rate instability, commodity price fluctuations and narrow tax bases, which magnify the adverse consequences of excessive borrowing. Yet there are also examples where debt has been used effectively to expand productive sectors and improve infrastructure, suggesting that context, governance and macroeconomic conditions matter greatly for interpreting debt–growth outcomes. Uganda-specific studies paint a similarly mixed picture: borrowing has supported short-term budget financing and public investment, but more recent evidence points to rising debt-service pressures, reduced fiscal space and limited long-term growth gains. These studies frequently treat public debt as a single aggregate and offer inconsistent conclusions about whether external or domestic borrowing is more detrimental to Uganda’s economic performance.

From this synthesis, three main gaps emerge that justify the present study. First, there is limited Uganda-specific empirical work that uses recent data covering the period of accelerated debt accumulation after 2015. Second, existing studies rarely distinguish systematically between the effects of external and domestic public debt within the same analytical framework, even though theory suggests that their growth implications may differ. Third, previous research often omits key macroeconomic controls such as capital formation, human capital, domestic savings, inflation and trade openness and does not fully model dynamic adjustment or causal relationships. This study responds to these gaps by applying an autoregressive distributed lag (ARDL) framework to Ugandan data for 1993–2023, separating external and domestic public debt, incorporating relevant macroeconomic variables and examining both equilibrium relationships and causality between public debt and real GDP per capita.

CHAPTER THREE
METHODOLOGY

3.0 Introduction

This chapter examines the research design and empirical model of the research, detailing the variables utilized and the estimation technique applied. The ARDL approach was employed to analyze the correlation involving public debt and economic growth.

3.1 Research Design

This study adopted a quantitative time-series research design because the objective was to analyze how key macroeconomic variables in Uganda evolved over time. The design utilized annual data covering the period 1993–2023, which allowed the study to observe trends, patterns and relationships among variables across multiple years within a single country. This approach is suitable for examining how changes in public debt relate to movements in economic growth over an extended period and provides a foundation for applying appropriate econometric techniques in the subsequent sections.

3.2 Theoretical Framework

The study employed the two-factor production function as outlined by the Cobb-Douglas production function, in which output depends on capital and labor. The major assumption of the model was diminishing returns to capital and labor separately in a closed economy (Mohammed, 2009). Aggregate output was depicted by Equation 3.1 below:

$$Y_t = f(K_t, L_t) \dots \dots \dots 3.1$$

Where, Y_t , K_t , and L_t represent cumulative output, the capital stock and labour. The model added an independently established factor, technology, to the production function. Technology was assumed to be determined exogenously (Mankiw, *et al.*, 1992). The resulting aggregate output function is also expressed as follows;

$$Y_t = f(K_t, A_t, L_t) \dots \dots \dots 3.2$$

Here, Y_t , K_t , A_t and L_t represent cumulative output, the capital stock, technology level and labour supply respectively. Introducing α as a parameter for production, we have equation 3.3;

$$Y_t = K_t^\alpha (A_t L_t)^{1-\alpha} \dots\dots\dots 3.3$$

The factor inputs in the model possess direct and diminishing marginal returns.

In order to incorporate public debt into this Solow–type framework, the study treats government borrowing as a factor that finances capital accumulation rather than as a separate factor of production. Public debt is used to finance public investment in infrastructure, human capital and other productive projects, thereby increasing the effective capital stock K_t and shifting the production path upward. At the same time, debt generates interest and repayment obligations that must be met from current output or tax revenues, which can reduce the resources available for private investment and growth-enhancing expenditure. Thus, in the extended model public debt affects output indirectly through capital accumulation and directly through debt-service costs. Whether the net effect on economic growth is positive or negative is therefore an empirical question, depending on how borrowed funds are used, the cost of servicing them and the overall macroeconomic environment. These insights justify including external and domestic public debt as key explanatory variables in the empirical model.

According to the Solow model; savings rates, public debt, population growth and technological progress are derived externally and are thus considered as exogenous. The main predictions of the model center on how investments in form of public debt, savings and population growth impact growth rate. Following Timakova (2011), and Opschoor (2015), the stable rate of growth per capita is as represented in the following expression;

$$\ln (y) = \ln (A(0)) + gt + \frac{\alpha}{1-\alpha} \ln (s) - \frac{\alpha}{1-\alpha} \ln(n + g + \delta) \dots\dots\dots 3.4$$

Here δ represents the rate of depreciation, s is savings that is invested and $n + g$ represents growth rates for $\{A_{(t)}(L_{(t)})\}$. Solow (1956), observes that the source of increase in per capita output therefore is capital deepening. However, it is crucial to highlight that each input in the above equation is paid through its marginal product. From the above model, countries that have high saving/investment rates tend to be richer since they accumulate more capital and as a result, they have more capital output (Phelps, 1961). This framework is pertinent to the current research since it examines output (growth) as a function of technology level, labour and capital which are associated with variables of this research, where domestic and external public debt are treated as key factors influencing capital accumulation and economic growth.

While Equation 3.4 provides the linearized Solow growth specification where output growth is determined by savings, population growth, technology, and depreciation, it does not explicitly include public debt. For empirical analysis, the model is therefore augmented by allowing public debt to influence capital accumulation and, consequently, economic output. This augmentation assumes that government borrowing (whether external or domestic) finances public investment and therefore enters the growth equation indirectly through the capital stock. By incorporating external and domestic debt as additional explanatory variables, the theoretical growth expression is transformed into an estimable empirical model suitable for Uganda’s macroeconomic data. This step provides the necessary linkage between the Solow framework and the ARDL model presented in Equation 3.5.

3.3 Empirical Model

According to Timakova (2011) if A is assumed in equation 3.4 to be a constant in terms of technology, it is also imperative to consider the possible variation in other factors such as the resource endowments, institutions and topography. Thus, an error term ε is introduced. Based on this analogy, the following is a general, basic empirical model of economic growth and public debt;

$$GDPPC_t = \beta_0 + \beta_1 PD_t + \beta' \sum_2^n X_t + \varepsilon_t \dots\dots\dots 3.5$$

Where $GDPPC_t$ represents logs of GDP per capita rate, PD_t is public debt at time t while (β_1) is the coefficient of public debt, X_t represents the respective vector of other covariates, β' represents the coefficients’ vector of other covariates, and ε_t is the stochastic term. GDP per capita was preferred in this study because it represents a measure of the financial prosperity of the nation's citizens. The measure is considered to be applicable since it excludes any possibility of black-market bias and it sheds light on the actual worth of economic success a country. A higher GDP per capita is often indicative of a more affluent market, thereby making such a market an attractive and favorable destination for investments.

Further, the study holds that economic growth is not only dependent on domestic or external debt, but also on other economic, institutional, and social control variables which may include public debt growth, money supply, foreign direct investment, population among others (Clements, 2003; Kinyua, 2015; Timakova, 2011; Opschoor, 2015). The above equation shows

how a stable state of economic growth depends on the effect of total domestic or external debt given a pool of other control variables. Equation 3.5 incorporates other variables that as well affect economic growth as established in the literature reviewed (Ocharo 2013; Njiru, 2014; and Kinyua, 2015). The linear econometric model is specified and expressed as follows:

$$GDPPC = \beta_0 + \beta_1 DDT + \beta_2 EDT + \beta_3 GDS + \beta_4 HCD + \beta_5 TOP + \beta_6 GFCF + \beta_7 FDI + \beta_8 INF + \varepsilon_t \dots\dots\dots 3.6$$

Where $GDPPC_t$ denotes the per capita output, DDT represents the domestic debt, EDT is the external debt, GDS is the Gross domestic savings, HCD which is the human capital development, TOP signify Trade openness , GFCF which is the Gross Fixed Capital Formation, FDI represents the foreign direct investments, and INF was the symbol for Inflation rate. Also β_0 is the intercept of the equation while β_1 to β_8 are the coefficient associated with independent variables of interest and other control variables whereas ε_t is the error term is employed to account for the hidden impacts, which are assumed to possess a mean of zero and exhibit non-serial correlation.

3.4 Definition and Measurement of Variables

Tables 3.1 below are the meanings and evaluation criteria for the study's variables.

Table 3.1: Definition and measurement of variables

| Variable | Variable Notation | Definition | Measurement of variables |
|--|-------------------|--|--|
| Per Capita Gross Domestic Product | GDPPC | This is the endogenous variable. GDP represents the sum output of goods and services in a country. | This is usually calculated from GDP to the ratio of total population |
| Domestic Debt | DD | Amount of a country's debt stock owed to lenders within the country per GDP. | Total monies owed by government domestically expressed as % of GDP |
| External Debt | ED | Amount of a country's debt stock which is payable to creditors outside the nation per GDP | Total monies owed by government externally expressed as % of GDP |
| Gross Domestic Savings | GDS | Gross Domestic Saving comprises household sector savings, private corporate sector and public sector. | Measured by dividing real investments with real GDP to capture the share of average investments in real GDP financed from savings. |
| Human Capital Development | HCD | This is a way of fulfilling the potential of people by enlarging their capabilities, knowledge, skills, and health that enable them to perform work in a manner that | Primary and secondary Schools gross enrollment rate. |

| Variable | Variable Notation | Definition | Measurement of variables |
|--------------------------------------|--------------------------|--|--|
| | | produces economic value. | |
| Trade openness | TOP | This refers to the degree to which a country is open to international trade. A country with high TOP has a higher trade to GDP ratio as opposed to a country with low TOP. | The total value of traded products and services, including imports and exports, represented as a ratio of GDP. |
| Gross Fixed Capital Formation | GFCF | Represents expenditures on fixed assets as a proportional of GDP, reflecting the investment levels in an economy. | Gross fixed capital formation to GDP |
| Foreign Direct Investments | FDI | FDI complements investment and thus stimulates economic growth. The study shall use this to check the complementary role of FDI on economic growth. | It is calculated as foreign direct funds as a share of GDP |
| Inflation | INF | The speed at which the general price level of a chosen group of goods and services rises over the course time in Uganda. | It is determined based on Consumer Price Index (CPI), which tracks fluctuations in the costs of products and services over a period. |

Source: Author, 2023

3.5 Data Types and Sources

The research utilized secondary data over a period of time, covering a period from 1993 to 2023. This period encompassed the time during which Uganda implemented economic reforms leading to significant economic growth, as well as the availability of data. All variables were got through World Development Indicators and annual publications from the Uganda Bureau of Statistics, such as economic surveys and abstracts. Additional specific secondary sources included annual reports obtained through the Central Bank of Uganda, the Ministry of Finance, Planning and Economic Development, the National Treasury, the World Economic Outlook Data, and the International Financial Statistics. Data on GDP per capita growth rate, gross domestic savings, inflation, and human capital were obtained from government financial reports published annually in statistical reports and economic assessments by the Uganda Bureau of Statistics (UBS). Foreign Direct Investment (FDI) data was sourced from the World Bank Indicators database available online.

3.6 Diagnostic Tests

3.6.1 Unit Root Tests

The data used for the study was of a time series nature and thus prone to non-stationarity. Time series analysis required the stationarity of data series to yield meaningful results, as estimation methods are sensitive to the nature of stationarity of data series (Algaba et al., 2020). Augmented Dickey-Fuller (ADF) unit root test was adopted to look for unit roots. The test had a null hypothesis of non-stationarity, which was declined if its associated z-statistic exceeded critical region values at the 1%, 5%, or 10% levels of significance. Rejection of the null hypothesis indicated that the tested series was stationary.

3.6.2 Serial Correlation

Bai et al. (2021) defined serial correlation as the relationship between a given variable and its lagged version over a specific time period. The autocorrelation test was employed to evaluate the extent to which a variable was correlated with both its past and present values. To detect serial correlation, the Breusch-Godfrey LM test was applied, comparing the competing hypothesis of serial correlation against the null hypothesis, which assumed no serial correlation. If the chi-square value was significant at the 5% level, the null hypothesis was rejected; otherwise, it was accepted.

3.6.3 Normality

Normality testing was conducted to determine if the disturbance term was normally distributed in the model. The Shapiro-Wilk test was utilized to assess the normal distribution of residuals. This test examined the null hypothesis of normal distribution. According to the decision criteria, the null hypothesis was not rejected if the p-value exceeded the 5% significance level.

3.6.4 Multicollinearity Check

Multicollinearity was assessed to determine if a substantial linkage existed between the exogenous variables when regressed against each other. According to Schober, Boer, and Schwarte (2018), associations ranging from 0.8 to 1 suggest the presence of severe multicollinearity in the model. To examine the potential for severe multicollinearity in the study, a Variance Inflation Factor (VIF) was used. VIF values exceeding 10 indicated severe multicollinearity.

3.7 Co-Integration test

After determining the characteristics of the variables' stationarity, the study aimed to assess whether the variables exhibited long-run linear combinations or cointegration. The focus was on investigating if a long-term or short-term interconnection existed between Uganda's gross domestic savings and economic growth. This involved determining whether the variables were in a state of equilibrium over the long term. The research employed the Johansen cointegration test to examine this. According to Johansen (1998), the following statistical analyses were used to estimate the cointegration rank and vector:

$$\tau_{trace}(\gamma) = -T \sum_{i=\gamma+1}^n \ln(1 - \tau_i) \dots\dots\dots 3.6$$

$$\tau_{max}(\gamma, \gamma + 1) = -T \ln(1 - \tau_{\gamma+1}) \dots\dots\dots 3.7$$

For the $\tau_{trace}(\gamma)$ statistics, the null hypothesis stated that the number of co-integrating vectors is no greater than γ against $\gamma = 1, 2, 3, 4, \dots$, while in case of τ_{max} statistics, the null hypothesis stated that the number of co-integrating vectors is no greater than γ against $\gamma = \gamma + 1$. If the study establishes that Cointegration exists (long run association) and non-stationarity established, Vector Error Correction Model (VECM) is conducted, otherwise, Vector Autoregression (VAR) is carried out. Also, a comparable bound test was considered. This Bounds Test for cointegration is embedded within the Auto Regressive Distributed Lag (ARDL) framework.

3.8 Granger Causality

One of the aims of the current research is to establish causal linkage associating the growth of Uganda's economy and public debt. This study utilizes the Granger Causality test subsequent to evaluation of all model assumptions. This examination aims to analyze causal connection linking Uganda's public debt and its economic growth. The research seeks to explore how lagged variables affect the endogenous variable, economic growth. Empirical research has provided evidence indicating that presence of non-stationarity within the analyzed time series can potentially result in inaccurate regression outcomes and undermine the validity of the conclusions drawn through the application of Granger Causality (Elias & Worku, 2015). It is important to highlight that Granger's causality test, in its conventional form, is non-applicable when a series contains co-integrating vectors. Granger's representation proposition (1988) posits that the outcomes of co-integration indicate the applicability of the subsequent error-correction

representations to series. Incorporating Error Correction Mechanism (ECM) in the simple Granger causality test is crucial for its enhancement. The ECM utilizes the residuals obtained from the relevant co-integration correlation to effectively examine causality;

$$Y_t = \alpha_1 + \sum_{i=1}^n \beta \Delta \ln X_{t-1} + \sum_{j=1}^m \gamma_j \Delta \ln Y_{t-j} + \rho_i ECT_{t-1} + \epsilon_t \dots \dots \dots 3.8$$

$$X_t = \alpha_2 + \sum_{i=1}^n \theta_i \Delta \ln X_{t-1} + \sum_{j=1}^m \delta_j \Delta \ln Y_{t-j} + \mu_i ECT_{t-1} + \epsilon_t \dots \dots \dots 3.9$$

Given that Y and X are the response and predictor variables, respectively; ρ_i represents the modification coefficient; ECT_{t-1} represents the error correction term of the growth equation; and Δ denotes the first difference operator. If both γ_j and ρ_i are non-zero, then X Granger causes Y in (3.8). In the case that both δ_j and μ_i are considerably different from zero, then Y Granger causes X in (3.9). A t-test is utilized to test error coefficient significance, and the F-statistic is applied to test the joint null hypothesis of $\gamma_j, \delta_j = 0$ (Eleanor, 2001; Elias & Worku, 2015).

3.9 Data Analysis

The study estimated the Auto Regressive Distributive Lag Model (ARDL). This is because, based on empirical evidence, the study variables were of mixed levels of stationarity $I(0)$ and $I(1)$. Furthermore, the study period 1993 – 2023 forms a sample space of 31 years, which is a short or exact ($n > 30$) time period. This period is considered to have considerable amount of data. The ARDL is efficient in the estimation of models with small samples whose coefficients have mixed levels of integration (Jalil et al., 2016).

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter explains the outcomes of the assessment focusing on ramifications of public debt on Uganda's economic expansion, utilizing time series data from 1993 to 2023. Various econometric techniques are applied to assess the correlation between GDP per capita and both external and domestic debt, while accounting for factors such as inflation, gross fixed capital formation, human capital development, total national savings, trade openness, and foreign direct investment. The chapter includes descriptive statistics, stationarity tests, the ARDL bounds test, and cointegration analysis to examine long-term associations. Additionally, Granger causality tests and diagnostic checks for Multicollinearity, serial correlation, and residual normality are done to guarantee the reliability of the findings. The results are analyzed in relation to existing literature to offer a comprehension on the ramifications of public debt on Uganda's economic expansion.

4.2 Descriptive Statistics

Descriptive statistics provide a fundamental summary of the dataset by outlining and highlighting its key traits. This section outlines a broad perspective of the descriptive statistics for the study variables, including GDP per capita (GDPPC), external debt (ED), domestic debt (DD), and control variables like inflation (INF), gross fixed capital formation (GFCF), human capital development (HCD), gross domestic savings (GDS), trade openness (TOP), and foreign direct investment (FDI). The aim is to offer insights into central tendencies, variability, and overall data distribution. Important statistical indicators such as mean, median, standard deviation, and range are outlined within the Table 4.1. This initial analysis is crucial for identifying underlying patterns and ensuring the reliability of subsequent statistical examinations.

Table 4.1: Summary Statistics

| Variable | Observations | Mean | Std. Dev. | Min | Max |
|-----------------------|---------------------|-------------|------------------|------------|------------|
| GDPPC (% growth rate) | 31 | 3.05 | 2.27 | .04 | 8.53 |
| ED (% of GDP) | 31 | 26.50 | 15.54 | 11.18 | 30.53 |
| DD (% of GDP) | 31 | 11.64 | 9.26 | 7.23 | 32.35 |
| GFCF (% of GDP) | 31 | 21.61 | 4.04 | 14.63 | 31.47 |
| INF (% annual change) | 31 | 6.50 | 4.10 | -.29 | 16.56 |
| HCD (Index) | 31 | 1.07 | .35 | .76 | 2.04 |
| GDS (% of GDP) | 31 | 12.71 | 5.97 | .26 | 23.55 |
| FDI (% of GDP) | 31 | 3.27 | 1.43 | .11 | 6.66 |
| TOP (% of GDP) | 31 | 37.49 | 5.90 | 27.84 | 56.26 |

GDPPC= Per Capita Gross Domestic Product, ED= External Debt, DD= Domestic Debt, GFCF= Gross Fixed Capital Formation, INF=Inflation, HCD= Human Capital Development, GDS= Gross Domestic Savings, FDI= Foreign Direct Investments and TOP= Trade openness

Source: Author's computation using STATA

The average GDP per capita is roughly 3.1 percent, with a standard deviation of 2.3 percent, indicating substantial variability in economic output per capita over the period. The minimum value of 0.04 percent reflects some years of extremely low economic performance, while the maximum value of 8.5 percent highlights periods of high economic output. This variability underscores the fluctuations in economic conditions experienced over the studied years. Human capital development, measured through a composite index of school enrolment and educational progress, averaged 1.07, ranging from 0.8 to 2.0, indicating gradual improvements in Uganda's education outcomes over the period.

External debt exhibits significant variability, with an average of 26.5 percent of GDP and a standard deviation of 15.5 percent. The minimum reported figure of 11.2 percent and maximum recorded value of 30.5 percent indicate periods of both low and very high external debt. This variability in external debt could impact economic stability and growth. In comparison, domestic debt averages 11.6 percent of GDP, with a standard deviation of 9.2 percent, reflecting moderate variability and a range from 7.2 percent to 32.4 percent. This range highlights differences in domestic borrowing over the years, which may influence economic conditions.

Investment and trade variables further illustrate economic dynamics. Gross fixed capital formation averages 21.6 percent of GDP, with a standard deviation of 4.0 percent, showing moderate variability in investment levels. The minimum and maximum values of 14.6 percent and 31.5 percent reflect fluctuations in capital investment. Inflation averages 6.50 percent with a high standard deviation of 4.1 percent, indicating significant variability in price levels, with values ranging from -0.3 percent to 16.6 percent, suggesting periods of deflation and high inflation. Additionally, gross domestic savings average 12.7 percent of the nation’s GDP with a standard deviation of 6.0 percent, foreign direct investments average 3.3 percent of the country’s GDP with a standard deviation of 1.4 percent, and trade openness averages 37.5 percent of the country’s GDP with a standard deviation of 5.9 percent. These figures demonstrate substantial variations in savings, foreign investments, and trade activity, which are crucial for understanding their impact on economic growth.

4.3 Time Series Properties

Time series properties explored include the unit root test and cointegration test. The former determines the stationarity of the time series data to avoid issues arising from non-stationary variables. Cointegration on the other hand, was tested to check whether a long-term equilibrium relationship exists between the variables in the model.

4.3.1 Unit Root Test

Within this study, the stability of the time series data was tested utilizing the Augmented Dickey-Fuller (ADF) test. This test was utilized to ascertain whether the variables contain unit roots, which may indicate non-stationarity. Ensuring that the variables are stationary is critical for avoiding spurious results in the analysis. The results of the unit root test are shown in the Table 4.2.

Table 4.2: Augmented Dickey-Fuller Test Results

| Variable | Before First Differencing | | After First Differencing | |
|----------|---------------------------|---------|--------------------------|---------|
| | Test statistic | p-value | Test statistic | p-value |
| GDPPC | -4.098 | 0.0010 | - | - |
| ED | -2.605 | 0.0920 | -3.944 | 0.0017 |
| DD | -2.205 | 0.2043 | -7.685 | 0.0000 |
| GFCF | -1.673 | 0.4453 | -6.955 | 0.0000 |
| INF | -4.048 | 0.0012 | - | - |

| | | | | |
|-----|--------|--------|--------|--------|
| HCD | 0.273 | 0.9761 | -5.147 | 0.0000 |
| GDS | -2.345 | 0.1580 | -7.262 | 0.0000 |
| FDI | -2.121 | 0.2361 | -3.377 | 0.0118 |
| TOP | -2.336 | 0.1607 | -6.052 | 0.0000 |

Source: Author's computation using STATA

The outcomes of the Augmented Dickey-Fuller test, indicate mixed stationarity properties among the variables before and after first differencing. Before differencing, GDP per capita and inflation were stationary at the 1% significance level, as evidenced by their test statistics (-4.098 and -4.048) and p-values (0.0010 and 0.0012). However, most other variables, including external debt, domestic debt, gross fixed capital formation, human capital development, gross domestic savings, foreign direct investments, and trade openness, were non-stationary before differencing, as indicated by their relatively high p-values, which exceeded the standard thresholds for significance.

After first differencing, all non-stationary variables achieved stationarity, as reflected by their significant p-values below 0.05. External debt, domestic debt gross fixed capital formation, human capital development, gross domestic savings, foreign direct investments, and trade openness exhibited strong evidence of stationarity with highly negative test statistics and p-values ranging from 0.0000 to 0.0118. These results confirm that first differencing was sufficient to achieve stationarity for all variables, ensuring their suitability for further time series analysis.

4.3.2 Cointegration Test

The ARDL Bounds test was used to evaluate cointegration, with the goal of determining whether a long-term equilibrium relationship exists between the variables in the model. This test examines cointegration by comparing the computed F-statistic to established critical value thresholds. If the F-statistic exceeds the upper bound, it signals a significant long-term connection among the variables. On the other hand, if the F-statistic is below the lower bound, it indicates no evidence of cointegration. The results of this test are shown in Table 4.3.

Table 4.3: ARDL Bounds Test Results

| F-Statistic | Level of Significance | Lower Bound | Upper Bound | Decision |
|-------------|-----------------------|-------------|-------------|---------------------------|
| 6.313 | 10% | 1.95 | 3.06 | Evidence of Cointegration |
| | 5% | 2.22 | 3.39 | |
| | 2.5% | 2.48 | 3.70 | |

| | | |
|----|------|------|
| 1% | 2.79 | 4.10 |
|----|------|------|

Source: Author's computation using STATA

The results of the ARDL Bounds test, assess the long-term relationship with Per Capita Gross Domestic Product as the dependent variable. The F-statistic of 6.313 surpasses the upper bound critical values at the 10 percent, 5 percent, 2.5 percent, and 1 percent significance levels, which are 3.06, 3.39, 3.70, and 4.10, respectively. This significant result indicates a long-term relationship between GDPPC and the independent variables: Domestic Debt, External Debt, Gross Fixed Capital Formation, Inflation, Human Capital Development, Gross Domestic Savings, Foreign Direct Investments, and Trade Openness. Consequently, these variables exhibit a consistent long-term relationship with GDPPC, suggesting they move together over time and maintain equilibrium.

4.4 Diagnostic Tests

In this study, diagnostic examinations were performed to confirm the dependability and accuracy of the model estimation. These tests include the correlation matrix which was undertaken to determine the magnitude and trend of variable associations. A normality test conducted to assess if the residuals follow a normal distribution, ensuring proper model assumptions. Serial correlation was also tested to check for autocorrelation in the residuals, which might affect the model's efficiency. Lastly, Multicollinearity was assessed to detect any high correlations among the independent variables that could affect the model's stability.

4.4.1 Correlation Analysis

The Pearson correlation coefficient was employed to assess the linear correlations involving pairs of variables, with results presented in Table 4.4. A positive relationship suggests that as one variable rises, the other also increases the alternative variable generally increases, whereas a negative correlation signifies a revers pattern correlation. Correlation coefficients range from -1 to 1, with values closer to 1 or -1 reflecting stronger correlations. This analysis clarified the interactions among variables such as GDP per capita, foreign debt, local debt, and other economic indicators, aiding in the refinement of the model for understanding Uganda's economic growth.

Table 4.4: Correlation Matrix

| Variable | GDPPC | ED | DD | GFCF | INF | HCD | GDS | FDI | TOP |
|----------|-------|----|----|------|-----|-----|-----|-----|-----|
|----------|-------|----|----|------|-----|-----|-----|-----|-----|

| | | | | | | | | | |
|-------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| GDPPC | 1.000 | | | | | | | | |
| ED | -0.117 | 1.000 | | | | | | | |
| DD | -0.070 | 0.744 | 1.000 | | | | | | |
| GFCF | -0.262 | -0.779 | -0.646 | 1.000 | | | | | |
| INF | 0.238 | -0.090 | 0.101 | -0.023 | 1.000 | | | | |
| HCD | -0.315 | -0.144 | 0.094 | 0.318 | -0.290 | 1.000 | | | |
| GDS | -0.389 | -0.587 | -0.319 | 0.779 | -0.168 | 0.502 | 1.000 | | |
| FDI | 0.199 | -0.584 | -0.283 | 0.356 | -0.017 | 0.379 | 0.273 | 1.000 | |
| TOP | 0.199 | -0.720 | -0.664 | 0.548 | 0.258 | 0.102 | 0.288 | 0.601 | 1.000 |

Source: Author's computation using STATA

The correlation analysis reveals that GDP per capita shows generally weak to moderate associations with the other economic variables. External debt and domestic debt have very weak negative correlations with GDPPC, at -0.117 and -0.07, respectively, indicating minimal impact of these debt types on the GDP per capita. While, gross fixed capital formation presents a moderate negative correlation of -0.262 with GDPPC, suggesting that higher investment in fixed assets might be associated with lower GDP per capita. Inflation signifies a weak positive correlation of 0.238 with GDPPC, indicating a slight association where increased inflation may be slightly related to higher GDP per capita. Additionally, human capital development shows a moderate negative correlation of -0.315, indicating that higher educational enrollment rates could be connected to lower GDP per capita during the analyzed period.

Gross domestic savings demonstrates a more substantial negative correlation of -0.389 with GDPPC, indicating that higher savings rates might be inversely related to GDP per capita. Foreign direct investments and trade openness both exhibit weak positive correlations with GDPPC, at 0.199 and 0.199, respectively, suggesting that increases in foreign investments and trade openness are slightly associated with higher GDP per capita. These correlations reveal the complex correlations between economic factors and GDP per capita, forming a basis for further analysis and model refinement to better understand their impacts on Uganda's economic growth.

4.4.2 Normality Test

Within this study, the normality of the residuals was assessed utilizing the Shapiro-Wilk test. This test was selected to show whether the residuals adhere to a normal distribution, which is a key assumption in many statistical analyses. Ensuring normality is crucial for the validity of inferential statistics and the accuracy of the findings. The outcomes of the normality examinations are shown in the Table 4.5.

Table 4.5: Shapiro Wilk Test Results

| Variable | Observations | W | V | z | Prob>z |
|--------------------------------------|--------------|-------|--------|--------|---------|
| GDPPC | 31 | 0.944 | 1.818 | 1.239 | 0.10768 |
| ED | 31 | 0.947 | 1.737 | 1.143 | 0.12642 |
| DD | 31 | 0.895 | 3.419 | 2.547 | 0.00543 |
| GFCF | 31 | 0.965 | 1.126 | 0.247 | 0.40258 |
| INF | 31 | 0.964 | 1.175 | 0.334 | 0.36925 |
| HCD | 31 | 0.556 | 14.450 | 5.533 | 0.00000 |
| GDS | 31 | 0.958 | 1.376 | 0.661 | 0.25425 |
| FDI | 31 | 0.912 | 2.851 | 2.171 | 0.01498 |
| TOP | 31 | 0.931 | 2.242 | 1.673 | 0.04718 |
| After Quantile Transformation | | | | | |
| DD | 31 | 0.995 | 0.174 | -3.625 | 0.99986 |
| HCD | 31 | 0.995 | 0.174 | -3.625 | 0.99986 |
| FDI | 31 | 0.995 | 0.174 | -3.625 | 0.99986 |
| TOP | 31 | 0.995 | 0.174 | -3.625 | 0.99986 |

Source: Author's computation using STATA

The Shapiro-Wilk test results show the normality of the variables before and after quantile transformation. Initially, GDP per capita and external debt have p-values of *0.10768* and *0.12642*, respectively, suggesting that their distributions are not significantly different from normal. In contrast, domestic debt and human capital development show significant deviations from normality where p-values of *0.00543* and *0.00000*, respectively, indicating substantial non-normality. Foreign direct investments and trade openness also exhibit some deviation, where p-values are *0.01498* and *0.04718*, respectively. After applying quantile transformation, DD, HCD, FDI, and TOP achieved p-values of *0.99986*, indicating that their distributions now conform to normality. This transformation effectively addressed the initial non-normality in these variables, allowing them to meet the normality assumption required for further analysis.

4.4.3 Serial Correlation

Serial correlation in the residuals was assessed using the Breusch-Godfrey LM test, which is designed to detect correlations over time. The presence of serial correlation is indicated by a p-value less than 0.05, suggesting that residuals exhibit significant correlation across periods. On the contrary, a p-value exceeding 0.05 signifies that residuals are not systematically related over time. The findings of the serial correlation test are shown in the Table 4.6.

Table 4.6: Breusch-Godfrey LM Test Results

| lags(p) | chi2 | df | Prob > chi2 |
|---------|------|----|-------------|
|---------|------|----|-------------|

| | | | |
|---|-------|---|--------|
| 1 | 0.665 | 1 | 0.4146 |
|---|-------|---|--------|

Source: Author's computation using STATA

The Breusch-Godfrey LM test results indicated that the p-value for the test with one lag is 0.4146. Given that this p-value is higher than the standard significance level of 0.05, there is no significant evidence of serial correlation in the residuals. This suggested that the residuals do not exhibit a consistent correlation over time, confirming that the model is not affected by serial correlation at the specified lag.

4.4.4 Multicollinearity Test

Multicollinearity was evaluated using the Variance Inflation Factor (VIF). The presence of Multicollinearity is indicated when VIF values exceed 10, suggesting high correlation among independent variables that could impact the reliability of the results. A VIF value below 10 suggests that Multicollinearity is not a significant issue. The findings of the Multicollinearity test are showed in the Table 4.7.

Table 4.7: Variance Inflation Factor Results

| Variable | VIF | 1/VIF |
|-----------------|-------------|--------------|
| ED | 6.49 | 0.1541 |
| GFCF | 5.41 | 0.1849 |
| DD | 5.33 | 0.1876 |
| GDS | 4.06 | 0.2464 |
| TOP | 3.83 | 0.2608 |
| FDI | 2.81 | 0.3559 |
| HCD | 2.10 | 0.4771 |
| INF | 1.94 | 0.5141 |
| Mean VIF | 4.00 | |

Source: Author's computation using STATA

The Variance Inflation Factor results show that all VIF values fall below the typical threshold of 10. Specifically, the VIF values for the variables range from 1.94 for inflation to 6.49 for external debt. These values suggest that Multicollinearity is not a major issue in the model, as none of the variables exhibit high levels of correlation with each other that could distort the analysis. The mean VIF value of 4.0 further supports that the level of Multicollinearity across the independent variables is generally low.

4.5 Granger Causality Test

The Granger causality test was conducted to determine if one time series can help predict another. It investigates whether past values of a variable offer valuable information for forecasting future values of a different variable, suggesting a possible causal relationship. The results of this test are shown in Table 4.8. A p-value less than 0.05 indicates that the variable in question Granger-causes the other, meaning it provides significant predictive value. In contrast, a p-value greater than 0.05 suggests no Granger causality, implying that past values of one variable do not contribute to predicting future values of the other.

Table 4.8: Granger Causality Test

| Equation | Excluded | chi2 | df | Prob > chi2 |
|----------|----------|---------|----|-------------|
| GDPPC | ED | .01112 | 1 | 0.916 |
| GDPPC | DD | .33306 | 1 | 0.564 |
| GDPPC | GFCF | 5.1e-05 | 1 | 0.994 |
| GDPPC | INF | .57152 | 1 | 0.450 |
| GDPPC | HCD | 2.4405 | 1 | 0.118 |
| GDPPC | GDS | 1.6658 | 1 | 0.197 |
| GDPPC | FDI | 1.1063 | 1 | 0.293 |
| GDPPC | TOP | .01329 | 1 | 0.908 |
| GDPPC | ALL | 12.523 | 8 | 0.129 |

Source: Author's computation using STATA

The Granger causality test results, indicate that none of the individual variables (external debt, domestic debt, gross fixed capital formation, inflation, human capital development, gross domestic savings, foreign direct investments, and trade openness exhibit Granger causality with GDP per capita, as all p-values exceed the 0.05 significance threshold. Additionally, the joint test for all independent variables produces a p-value of 0.129, further confirming the absence of significant Granger causality toward GDPPC. Therefore, historical values of these variables do not offer substantial predictive insight into future GDPPC values.

4.6 Estimation of the ARDL Model and Discussion of the Results

The findings of this study were obtained using the Autoregressive Distributed Lag model, which was applied to examine both short-run and long-run relationships between the dependent and independent variables. This method allows for a comprehensive analysis of how the variables interact across different timeframes. The ARDL model offers insights into both the immediate short-term effects and the long-term equilibrium relationships. The following sections provide a

detailed discussion of these estimations, focusing on the interplay of public debt and economic expansion variables.

4.6.1 Short Run Results

The findings on the short-run dynamics of the variables, considering both domestic and external influences on economic growth, are comprehensively summarized in Table 4.9. This table illustrates the immediate ramifications of the independent variables on the dependent variable, emphasizing short-term relationships and adjustments within the ARDL model framework.

Table 4.9: Estimated ARDL Short Run Results

| GDPPC | Coefficients. | Std. Err. | t | P>t | [95% Conf. Interval] | |
|-------------------------------|----------------------|------------------|----------|---------------|-----------------------------|---------|
| ED | .1268** | .0435 | 2.91 | 0.010 | .0350 | .2186 |
| Norm DD | 1.0355 | .5959 | 1.74 | 0.100 | -.2216 | 2.2927 |
| GFCF | .1705 | .2117 | 0.81 | 0.432 | -.2761 | .6171 |
| INF | -.1604* | .0805 | -1.99 | 0.063 | -.3302 | .0094 |
| Norm HCD | -3.0750 | 2.2174 | -1.39 | 0.183 | -7.7533 | 1.6032 |
| GDS | -.2291** | .1044 | -2.20 | 0.042 | -.4492 | -.0089 |
| Norm FDI | -.6159 | .3720 | -1.66 | 0.116 | -1.4006 | .1689 |
| Norm TOP | .2402** | .1034 | 2.32 | 0.033 | .0221 | .4583 |
| constant | -1.8973 | 6.4723 | -0.29 | 0.773 | -15.5527 | 11.7581 |
| Number of observations | 30 | | | | | |
| F(12, 17) | 3.90 | | | | | |
| Prob > F | 0.0055 | | | | | |
| R-squared | 0.7337 | | | | | |

**Significant at 5% and *significant at 10%

Source: Author's computation using STATA

The short-run outcomes from the ARDL model, reveal the dynamics between various independent variables and GDP per capita. The variable external debt exhibits a statistically significant positive coefficient of 0.1268 with a p-value of 0.010, implying that within the short run, increases in external debt are associated with higher GDP per capita. This positive effect, although statistically significant, may require further investigation to understand its underlying mechanisms. Conversely, domestic debt shows a coefficient of 1.0355 where a p-value of 0.100, showing that it does not significantly impact GDPPC within the short run.

Gross fixed capital formation has a coefficient of 0.1705 where a p-value of 0.432, indicating no significant short-term impact on GDP per capita. This suggests that variations in capital formation do not immediately influence GDPPC. Conversely, Inflation has a coefficient of -0.1604 and a p-value of 0.063, which is statistically significant at the 10% level. This implies a weak yet statistically notable negative correlation with GDPPC. Meanwhile, human capital development and foreign direct investment have coefficients of -3.0750 and -0.6159, respectively, with p-values of 0.183 and 0.116, signifying no significant short-term effects on GDPPC.

Furthermore, gross domestic savings exhibits a statistically significant negative impact, with a coefficient of -0.2291 and a p-value of 0.042. This suggests that higher savings may be linked to lower GDP per capita in the short run, a finding that merits further investigation. Trade openness, on the other hand, has a notable positive effect on GDPPC, with a coefficient of 0.2402 and a p-value of 0.033, indicating that increased trade openness contributes positively to GDP per capita. Overall, the model statistics show an F-statistic of 3.90 with a p-value of 0.0055, confirming that the model significantly explains the variations in GDP per capita. Additionally, the R-squared value of 0.7337 suggests a strong fit, with approximately 73.37% of the variation in GDP per capita being accounted for by the model.

4.6.2 Long Run Results

Tables 4.10 present the results pertinent to the long-term correlations explored in the study. The analysis used GDP per capita as the primary indicator of economic expansion. In the long-run estimations, GDP per capita was considered the dependent variable, while public debt, domestic debt, gross fixed capital formation, inflation, human capital development, gross domestic savings, foreign direct investments, and trade openness were included as independent variables. The study also controlled for these variables to comprehensively assess their impact over the long term.

Table 4.10: Estimated ARDL Long Run Results

| GDPPC | Coefficient | Std. Err. | t | P> t | [95% Conf. Interval] | |
|--------------|--------------------|------------------|----------|-----------------|-----------------------------|--------|
| ED | -.0289 | .0319 | -0.91 | 0.377 | -.0961 | .0383 |
| Norm DD | 1.0727 | .6744 | 1.59 | 0.130 | -.3502 | 2.4955 |
| GFCF | .1766 | .2366 | 0.75 | 0.465 | -.3225 | .6757 |
| INF | -.1720 | .1467 | -1.17 | 0.257 | -.4815 | .1375 |

| | | | | | | |
|-------------------------------|---------|--------|-------|-------|---------|-------|
| Norm HCD | -2.3201 | 1.4914 | -1.56 | 0.138 | -5.4667 | .8264 |
| GDS | -.2373* | .1187 | -2.00 | 0.062 | -.4876 | .0131 |
| Norm FDI | -.6379 | .4147 | -1.54 | 0.142 | -1.5130 | .2371 |
| Norm TOP | .2488** | .1133 | 2.20 | 0.042 | .0098 | .4879 |
| Number of observations | 30 | | | | | |
| R-squared | 0.8194 | | | | | |

***Significant at 5% and *significant at 10%*

Source: Author's computation using STATA

The long-run results presented in Table 4.10 highlight the differing effects of various economic variables on GDP per capita. The coefficient for public debt is -0.0289, with a p-value of 0.377, indicating that public debt does not have a statistically significant long-term impact on GDP per capita. Additionally, the confidence interval, spanning from -0.0961 to 0.0383, includes zero, reinforcing the uncertainty regarding the influence of public debt on economic growth.

Similarly, domestic debt shows a coefficient of 1.0727 with a p-value of 0.130, indicating a positive correlation with GDP per capita; however, this effect is not statistically significant. The confidence interval, ranging from -0.3502 to 2.4955, suggests a wide range of potential impacts, emphasizing the uncertainty regarding the role of domestic debt in economic growth. Likewise, gross fixed capital formation and inflation show no significant long-term influence on GDP per capita, with coefficients of 0.1766 and -0.1720, and p-values of 0.465 and 0.257, respectively. The inclusion of zero in their confidence intervals further confirms that neither gross fixed capital formation nor inflation plays a substantial role in long-term economic growth.

In contrast, gross domestic savings and trade openness significantly impact GDP per capita, with coefficients of -0.2373 and 0.2488, and p-values of 0.062 and 0.042, respectively. This signifies a statistically significant positive long-term correlation with GDP per capita. But the link was statistically significant at 5% for GDS and 10% for TOP. This results, implies that increased GDS and TOP contributes positively to economic growth. The model's R-squared value of 0.8194 demonstrates that the included variables explain approximately 82% of the variance in GDP per capita, indicating a robust fit and strong explanatory power of the model in capturing the long-term correlations involving the variables and economic growth.

The short-run results from the ARDL model shed light on the complex correlations between public debt and GDP per capita. The analysis reveals that external debt has a positive and

statistically significant short-term effect on GDPPC. This finding aligns with the study by Mhlaba and Phiri (2019), who found a positive short-term effect of external debt on economic growth in South Africa. However, this result contrasts with the work of Hassan and Tahmina Akhter (2016), who observed an inverse correlation involving foreign debt and GDP growth. This discrepancy underscores the need for further investigation into the mechanisms through which external debt influences economic growth.

In contrast, domestic debt does not exhibit a significant short-term impact on GDPPC, suggesting that changes in domestic debt levels do not immediately affect GDP per capita. This result is consistent with the outcomes of Atapattu (2020), who highlighted a nuanced correlation involving domestic debt and economic growth, particularly in the context of Sri Lanka. Gross Fixed Capital Formation also shows no significant short-term effect on GDPPC, which corresponds with previous studies, such as those by Wu, Zhong, and Wu (2021), who found that investment levels alone may not always directly correlate with immediate economic growth.

Inflation rate has a significant albeit weak as well as negative correlation with GDPPC, indicating a potential but not robust negative effect. This corresponds with the findings of Jacobs et al. (2020), who observed negative implications of elevated public debt on economic growth, partly attributed to inflationary pressures. Human capital development and foreign direct investment both show no significant short-run effects, which aligns with Asteriou, Pilbeam, and Pratiwi (2021) who found mixed findings concerning the impact of human capital and foreign investments on growth, emphasizing the complexity and variability of these correlations across different contexts.

Conversely, gross domestic savings demonstrates a significant negative influence on GDPPC, suggesting that higher savings could be linked to lower short-term GDP per capita. These findings contrast with the general view in literature where higher savings are typically associated with positive economic outcomes. Trade openness on the contrary, exhibits a significant positive effect on GDPPC, consistent with findings from Onafowor and Owoye (2019), who emphasized the beneficial role of trade openness in promoting economic growth. Overall, the model's robustness, as demonstrated by the substantial F-statistic and high R-squared value, suggests that the model effectively captures the variation in GDP per capita, although the differing impacts of

individual variables indicate a complex and context-dependent correlation involving public debt and economic growth.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of findings, conclusions drawn from the analysis, and recommendations based on the study results. It begins with a concise summary of the key findings on the effect of public debt on Uganda's economic growth. This is followed by conclusions that are in line with the research objectives outlined in previous chapters. Finally, recommendations are provided for policymakers, researchers, and other stakeholders to address the study's implications, together with suggestions for future research.

5.2 Summary of the Findings

Public debt has contributed a pivotal function in creating fiscal space for the government of Uganda, enabling significant public investments that have contributed to the country's economic growth. However, while debt financing has supported development initiatives, it has also led to rising fiscal imbalances, driven by increased debt servicing obligations. The increasing reliance on external and domestic borrowing to finance these investments has, in turn, placed pressure on the economy, as the government must continuously seek additional loans to service existing debts. This duality of public debt underscores the need for a careful assessment of its effect on Uganda's economic growth, which this study has sought to explore through its key findings.

The main purpose of this study was to analyze the effect of public debt on Uganda's economic growth over the period 1993–2023. In particular, the study distinguished between external debt and domestic debt, recognizing that these two components may influence growth through different channels. Using a time-series framework, the study examined how movements in each type of public debt relate to changes in real GDP per capita.

The first specific objective was to assess the impact of external debt on economic growth in Uganda. The findings show that external debt is positively associated with economic growth in the short run. This suggests that external borrowing has played an important role in financing productive public investments such as infrastructure and social services, which in turn have supported higher output per capita. At the same time, the results highlight concerns about the

long-term sustainability of relying heavily on foreign borrowing, given the rising interest and principal repayments that continue to claim a sizeable share of the national budget.

The second specific objective was to assess the impact of domestic debt on economic growth in Uganda. The study finds that domestic debt does not exert a strong or consistent influence on economic growth in the short term. Although the estimated relationship is generally positive, it is relatively weak, indicating that domestic borrowing has not translated into growth-enhancing expenditure to the same extent as external debt. This may reflect the use of domestic debt to finance recurrent spending or rollover existing obligations rather than to support new productive investment. The study concludes that public debt has contributed to Uganda's economic performance mainly through external borrowing, while domestic debt has had a more muted effect on growth. These findings underscore the need for careful balancing of external and domestic borrowing, with greater emphasis on using both types of debt to finance investments that can sustain long-term economic growth and ensure debt sustainability.

5.3 Conclusions of the Study

This study set out to examine how public debt affects Uganda's economic growth by distinguishing between external and domestic debt over the period 1993–2023. The findings show that external debt is positively associated with economic growth in the short run, indicating that foreign borrowing has played an important role in financing productive public investments that raise output per capita. At the same time, the build-up of external obligations has increased debt-service pressures, signaling the need for cautious borrowing and careful project selection to safeguard long-term debt sustainability.

In contrast, domestic debt does not display a strong or consistent relationship with economic growth, suggesting that local borrowing has been less effective in driving output, possibly because it is used more for recurrent expenditure or refinancing than for growth-enhancing projects. Other macroeconomic factors particularly the supportive role of trade openness and the adverse association between gross domestic savings and growth underscore that Uganda's performance depends not only on how much the government borrows, but also on how well debt is managed alongside policies that deepen financial intermediation and strengthen integration into regional and global markets. Overall, the study concludes that the composition and quality of public debt, rather than its sheer size, are critical for sustaining Uganda's economic growth.

5.4 Recommendations of the Study

In light of the finding that external debt is positively associated with Uganda's economic growth in the short run, government should continue to access external borrowing, but strictly on a selective and productivity-oriented basis. New loans ought to be predominantly concessional, anchored in a clear medium-term debt strategy, and tied to well-screened projects in infrastructure, human capital and productive sectors that raise export capacity and tax revenue. Strengthening project appraisal, procurement and implementation monitoring is essential so that externally financed investments generate sufficient economic returns to cover their future debt-service obligations. In addition, authorities should regularly conduct and publish debt-sustainability analyses to ensure that the pace and composition of external borrowing remain consistent with long-term macroeconomic stability.

Given that domestic debt does not exhibit a strong or consistent link with economic growth, the use and structure of local borrowing require re-alignment. Domestic debt should gradually shift away from financing recurrent expenditure and short-term cash-flow gaps towards financing clearly identified development priorities that complement externally funded projects. This may include lengthening the maturity profile of government securities, broadening the investor base beyond commercial banks, and encouraging instruments that support long-term investment rather than purely short-term liquidity management. By improving the efficiency of domestic borrowing and reducing rollover and interest-rate risks, government can enhance the contribution of domestic debt to growth while safeguarding financial stability.

Thus, the results point to the need for a balanced public-debt strategy that recognizes the supportive role of external borrowing for growth, while avoiding excessive reliance on it, and simultaneously reforms domestic debt management so that local borrowing becomes more development-oriented. Policymakers should therefore align fiscal, debt-management and public-investment decisions around a common objective: using both external and domestic debt as complementary instruments to finance high-return projects, preserve debt sustainability and support Uganda's long-term economic development.

5.5 Suggestions for Further Research

Future research should explore the sector-specific impacts of public debt on critical areas like infrastructure, health, and education. A detailed analysis of how different types of debt influence these sectors could offer targeted insights into how public debt contributes to overall economic development. Additionally, comparative studies with countries in similar economic contexts would provide valuable perspectives on unique factors affecting Uganda's economy. Such comparisons could reveal best practices and strategies that have proven successful elsewhere and could be adapted to enhance Uganda's economic outcomes.

Further investigation into debt management strategies and their effectiveness in promoting economic growth is also warranted. This research could assess various debt servicing approaches and policies designed to improve debt sustainability, identifying the most effective methods for managing public debt. Additionally, studying the influence of foreign economic shocks (such as fluctuations in global commodity prices or international financial crises) on the correlation involving public debt and economic growth could offer deeper insights into the resilience of Uganda's economy. Understanding these dynamics would help in formulating strategies to minimize the harmful consequences of global uncertainties on economic performance.

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