



**MAKERERE**

**UNIVERSITY**

**COLLEGE OF BUSINESS AND MANAGEMENT SCIENCES (COBAMS)**

**EFFECT OF GOVERNMENT EXPENDITURE ON ECONOMIC GROWTH IN  
UGANDA 1992 TO 2022**

**BY**

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**2023/HD06/22262X**

**A RESEARCH REPORT SUBMITTED TO THE DIRECTORATE OF RESEARCH  
AND GRADUATE TRAINING OF MAKERERE UNIVERSITY IN PARTIAL  
FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTERS  
DEGREE OF ARTS IN ECONOMIC POLICY AND MANAGEMENT**

**JUNE, 2025**

## DECLARATION

### DECLARATION

I, BIDALI Bismark Rashid hereby declare that this dissertation entitled "Effect of Government Expenditure on Economic Growth in Uganda 1992 to 2022" is my own work and that all the sources, I have used or quoted have been acknowledged.

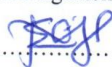
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**CERTIFICATION**

The undersigned certify that they have read this dissertation titled "Effect of Government Expenditure on Economic Growth in Uganda 1992 to 2022" in the process of guiding the author and thereby recommend it for submission to the Directorate of Research and Graduate Training of Makerere University in the partial fulfillment of the award of the degree of Master of Arts in Economic policy and Management of Makerere University.

Signed .....  ..... Date 07/07/2025 .....

Nyiringye Aggrey (PhD)

## DEDICATION

To God Almighty, who is most beneficial and most merciful, who blessed me with the power to fulfil this task.

I would like to dedicate this dissertation to my dear wife Samanaya Samira who supported me at my lowest. A special feeling of gratitude to my loving parents, Rashid Abdalla and Joan Celine whose words of encouragement and push for tenacity ring in my ears. My lovely sons, Juma Lucky Bismark, Gift Manase Bismark and daughter Shania Shafina Bismark who have never left my side and they are very special.

I also dedicate this dissertation to my many friends who have supported me throughout the process. I will always appreciate all they have done, especially Micheal Onario for helping me develop my technology and Godo Aggrey for the many hours of proofreading, and for helping me to master the leader dots.

I give special thanks to my cousin and friend Bogere Chaplin and my wonderful family for being there for me throughout the entire Masters Program. Both of you have been my best cheerleaders.

## **ACKNOWLEDGEMENT**

During the course of this research, I have received significant help from a number of people whose input was helpful in accomplishing this work. Sincere thanks go to my supervisors by the names; Nyiringye Aggrey (PhD) for their technical guidance towards the completion of this study. I highly recognize the contributions of all School of Economics teaching staff right away from the Dean School of Economics; Prof Okumu Ibrahim Mike and all my lecturers; Dr. Ibrahim Mukisa, Prof. Yawe Bruno Lule, Dr. J. Teera, Dr. Aisha Nanyiti and all other non-teaching staff of School of Economics, Makerere University to my academic achievement. In fact without a good knowledge in economics, this research would have been very difficult for me.

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## **ABSTRACT**

This study investigates the effect of government expenditure on economic growth in Uganda. Using annual time series data for the period 1992-2022, the study examines GDP as the dependent variable and various components of government expenditure, including health, education, and military spending, as independent variables, alongside other control variables. The Phillips-Perron test revealed a mix of variables integrated at order  $I(0)$  and  $I(1)$ . The bounds test confirmed the existence of a long-run relationship between government expenditure and economic growth. An Error Correction Model was then employed to estimate the short- and long-term dynamics, revealing that health and education expenditures have significant positive impacts on economic growth, while military expenditure is insignificant. Debt servicing has a positive long-run effect but poses short-term fiscal constraints. The findings emphasize the need for increased investment in health and education to drive economic growth, alongside prudent debt management strategies to balance short-term and long-term fiscal impacts.

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## CHAPTER ONE

### 1.0 Introduction

The relationship between government expenditure and economic growth has been widely examined in economic literature, with varying conclusions on its impact across different economies and time periods. Government expenditure, which includes spending on infrastructure, health, education, defense, and public services, is seen as a critical tool for promoting economic growth by enhancing productivity, stimulating demand, and creating employment. In the case of Uganda, understanding the effect of government expenditure on economic growth is particularly relevant due to its evolving fiscal policies and economic challenges over recent decades.

Economic theories offer contrasting perspectives on the role of government spending in promoting growth. Keynesian theory suggests that government spending, especially in times of low demand, can stimulate economic activity and foster growth. According to Keynesian economists, increased public expenditure can "crowd in" private investment by creating more demand and reducing excess capacity in the economy. On the other hand, the neoclassical perspective, including theories by Barro (1990) and others, argues that excessive government spending can be inefficient and potentially "crowd out" private investment by driving up interest rates and misallocating resources.

Empirical studies provide additional insights but vary based on context. For instance, Aregbeyen and Akpan (2013) and Abu-Bader and Abu-Qarn (2003) found a positive relationship between government spending and economic growth in developing economies, particularly when spending was directed toward productive sectors like infrastructure, health, and education. Conversely, studies in certain African countries, such as South Africa and Nigeria, have shown that high levels of recurrent expenditure may have limited impact on growth or, in some cases, a negative effect when financed by high debt levels SOMOYE and ONAKOYA (2013).

Uganda's government expenditure patterns from 1992 to 2022 reveal periods of both economic reform and expansion, aimed at fostering growth and addressing poverty. Uganda has invested heavily in infrastructure development, public health, and education as a means of promoting economic growth. Yet, the impact of these expenditures on growth remains complex, as factors such as inefficiencies in public spending, debt sustainability, and external economic conditions continue to play a significant role.

This study examines the effects of government expenditure on Uganda's economic growth from 1992 to 2022, considering how different categories of spending (capital and recurrent) contribute to growth outcomes. By assessing these patterns and their impact, this research aims to provide insights into effective fiscal policies that could support sustained economic growth in Uganda.

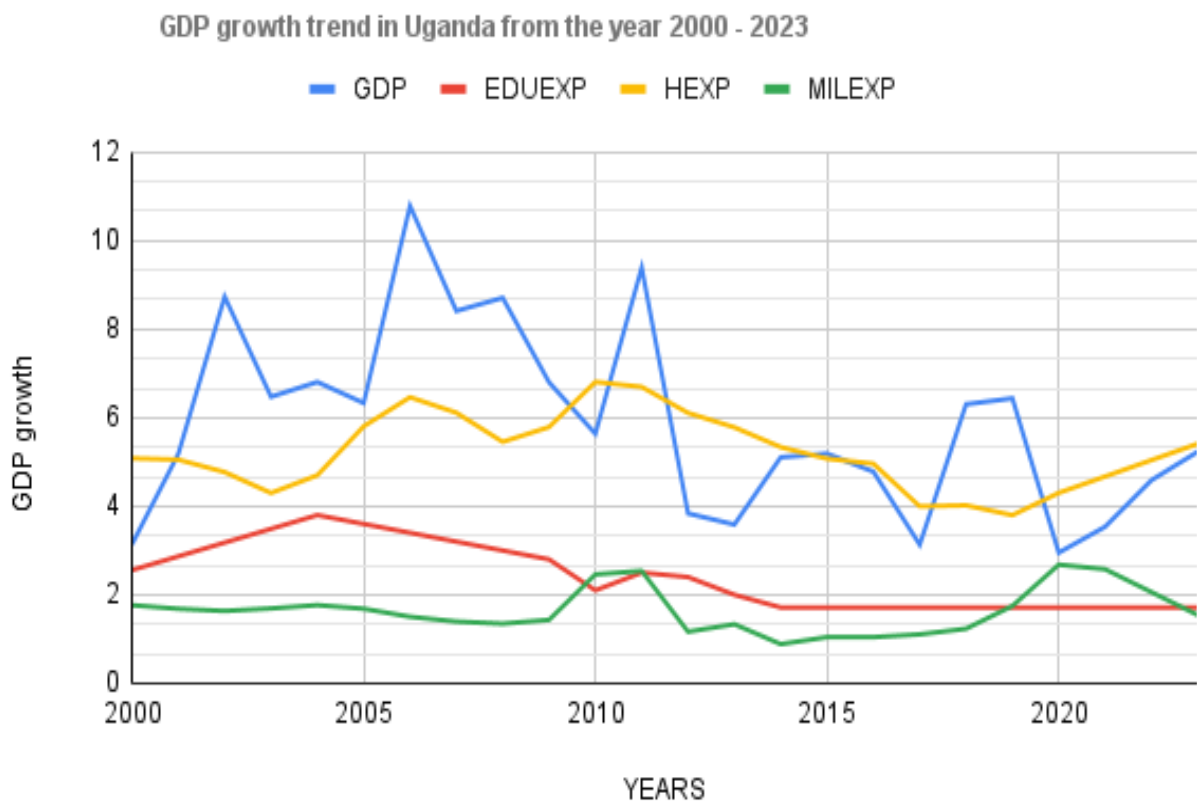
## **1.1 Background of the study**

Government expenditure plays a critical role in shaping economic growth, particularly in developing economies like Uganda. Since the early 2000s, Uganda has undertaken significant public spending initiatives aimed at addressing infrastructural deficits, improving social services, and fostering human capital development. Public investments in sectors such as education, health, and infrastructure have been seen as essential drivers of long-term economic transformation. However, the impact of these expenditures on economic growth remains a subject of debate.

Between 2000 and 2022, Uganda's government implemented several fiscal policies and development programs, including the National Development Plans (NDPs), which targeted key sectors to stimulate economic growth and reduce poverty (Mawejje & Odhiambo, 2021). Despite these efforts, Uganda continues to face challenges such as rising public debt, inefficient resource allocation, and persistent budget deficits. This raises an important question: has government expenditure translated into sustainable economic growth, or has it simply increased the fiscal burden without achieving the desired outcomes?

This study is motivated by the need to understand the relationship between government spending and economic growth in Uganda. As policymakers grapple with balancing fiscal discipline and growth-promoting investments, it is crucial to examine whether public spending has had a significant and positive impact on the country's economic performance. Understanding this dynamic can offer insights into optimizing public resource allocation to achieve sustained growth and development in Uganda.

Figure 1: *illustrates the trend of the GDP growth in Uganda from periods of 2000 to 2022. Overall results show increased government expenditure in key sectors such as health and education while military expenditure shows minimal impact on economic growth.*



Source: WDI data 2023

From 2000 to 2008, Uganda experienced strong GDP growth, driven by increased government spending, particularly in the health sector. However, after the 2008 global financial crisis, growth slowed significantly, with a notable dip around 2010. While there was some recovery after 2012, GDP growth remained moderate and unstable, with another decline around 2015. Education expenditure peaked in the mid-2000s but declined over time, and health spending leveled off after 2010, possibly contributing to the sluggish growth in the latter period. Military spending remained low and stable, showing little correlation with economic growth throughout the years. Overall, Uganda's growth reflects the importance of efficient government spending in key sectors.

## **1.2 Statement of the problem**

Despite Uganda's significant public spending initiatives aimed at fostering economic growth through investments in education, health, and infrastructure, the actual impact of government expenditure on long-term economic growth remains unclear. While Uganda experienced strong GDP growth in the early 2000s, driven by increased spending in critical sectors, the global financial crisis and subsequent fiscal challenges, such as rising public debt and budget deficits, have raised concerns about the sustainability of this growth.

Key expenditures, particularly in health and education, have shown a positive correlation with growth during certain periods, but inconsistent resource allocation and inefficiencies have led to moderate and unstable growth in recent years. This raises the crucial question of whether Uganda's government expenditure has effectively translated into sustained economic growth or has merely added to the fiscal burden without delivering the desired outcomes. Therefore, there is a need to critically assess the relationship between government expenditure and economic growth in Uganda from 2000 to 2022, in order to inform better fiscal policy and resource allocation strategies.

## **1.3 Objectives of the study**

The study objective is to assess the effect of government expenditure on economic growth in Uganda from the period of 2000 to 2022 and its guided by the following specific objectives;

- a) To examine the effect of government expenditure on key sectors of education, health, and military on economic growth in Uganda from 1992 to 2022.
- b) To analyze the effect of the composition of government expenditure on Uganda's economic growth during the period 1992 to 2022.

## **1.4 Hypothesis of the study**

- a) Government expenditure on education, health and Military has a positive and significant effect on economic growth in Uganda from 1992 to 2022.
- b) The composition of government expenditure significantly influences Uganda's economic growth from 1992 to 2022.

### **1.5. Significance of the study**

This study is significant as it provides empirical insights into the effect of Uganda's public expenditure on economic growth, focusing on key sectors such as agriculture, industry, and services. It will offer policymakers and stakeholders a clearer understanding of how public expenditure affects sectors and contribute to academic literature by highlighting the extent to which Ugandas public expediture influences overall economic performance. The findings will be valuable for guiding fiscal policies, ensuring sustainable debt management, and helping international institutions and government bodies design strategies that balance economic growth with fiscal responsibility.

### **1.6 Organization of the study report**

The study is organized into Five chapters. Chapter one presents the introduction of the study and consists of the background of the study, problem statement, objectives of the study, hypothesis of the study, significance and justification of the study, scope of the study and the organization of the study. Chapter two describes the theoretical literature and empirical studies related to government expenditure and economic growth. In chapter three, the study reviews theoretical framework and estimation strategy as well as estimation techniques and explains the data sources. Chapter Four comprises of the results of descriptive statistics, discussion of results while chapter five presents the summary of the study, limitations of the study, policy recommendations and areas for further research. The dissertation also contains references and appendices at the end.

## CHAPTER TWO

### **2.0 literature Review**

The literature review examines existing research and theories on the relationship between government expenditure and economic growth, with a focus on sectoral impacts in areas such as education, health, and military spending. This section synthesizes findings from various studies to provide a comprehensive understanding of how government spending compositions influence economic performance, particularly within the context of developing economies like Uganda.

#### **Keynesian Theory of Government Spending and Economic Growth**

Keynesian economics argues that government spending plays a critical counter-cyclical role in boosting aggregate demand, especially during economic downturns (Keynes, 1936). It assumes that public expenditure, particularly in infrastructure and social services, can stimulate production, create employment, and ultimately promote economic growth. In the Ugandan context, this perspective was notably reflected in the government's post-COVID-19 recovery strategy, which emphasized fiscal stimulus through health sector expansion and infrastructure investment. Empirical work by Mugume and Obwona (2001) supports this approach, showing positive GDP effects from public investment, particularly in rural infrastructure and agriculture.

However, Keynesian theory assumes that governments can efficiently allocate resources and that fiscal multipliers are sufficiently strong to generate significant economic returns. In practice, the effectiveness of fiscal policy in Uganda may be undermined by issues such as corruption, inefficient public procurement, and debt sustainability concerns. Thus, while the theory offers a useful framework for understanding short-term policy responses, it may overstate the capacity of the Ugandan government to deliver sustained economic growth through public expenditure alone.

#### **Wagner's Law of Increasing State Activities**

In contrast, Wagner's Law posits a long-term, endogenous relationship between economic development and increased public spending, arguing that as economies grow, citizens demand more public goods and services, leading to an expanded state role (Wagner, 1958). This appears consistent with trends in Uganda, where economic growth has been accompanied by rising

expenditure in education, health, and infrastructure. The National Budget Framework Paper (NBFP, 2023/24) reflects this trajectory, highlighting increasing allocations toward human capital development and public service delivery.

Nonetheless, Wagner's Law has been critiqued for its deterministic view that economic growth naturally results in greater government spending, without considering political economy factors, such as the role of donor influence, political patronage, or inefficiencies in fiscal management. In Uganda's case, some increases in public expenditure have been driven less by organic economic demands and more by political expedience or external conditionalities.

In sum, while both Keynesian theory and Wagner's Law offer useful insights into the relationship between government spending and economic growth, they rest on different assumptions and face contextual limitations. A more nuanced understanding of Uganda's fiscal dynamics must therefore consider not only theoretical expectations but also institutional capacity, governance quality, and political economy constraints.

### **Peacock and Wiseman Displacement Effect Theory**

This theory argues that government expenditure often rises in response to crises, as societies become more accepting of higher public spending during emergencies (Peacock & Wiseman, 2024). Once the crisis abates, the new level of public expenditure tends to persist. This theory is applicable to Uganda, especially in the wake of the COVID-19 pandemic. The government significantly increased health sector spending, introduced relief packages, and enhanced support for vulnerable populations. These measures, though initially seen as temporary, have contributed to a lasting expansion in certain expenditure categories. Empirical analyses, such as those by Kuteesa et al. (2021), underscore how the pandemic accelerated government interventions in health and social protection, with long-term implications on fiscal policy.

### **Endogenous Growth Theory**

Endogenous growth theory emphasizes that government policies—particularly public expenditure on education, health, and infrastructure can generate sustained economic growth by enhancing human capital, encouraging innovation, and increasing productivity (Romer, 1990). In Uganda, this theory provides a compelling framework for understanding how government spending contributes to long-term development. Increased budget allocations to

Universal Primary and Secondary Education (UPE and USE), health infrastructure, and roads under the Uganda National Development Plan (NDP III) are aimed at improving human capital and reducing regional disparities. According to Tumushabe et al. (2020), such investments have led to measurable improvements in literacy rates, health outcomes, and rural connectivity, which are key enablers of inclusive economic growth. Furthermore, Muwonge (2018) argues that Uganda's targeted public investment in strategic sectors has supported private sector growth by reducing operational bottlenecks, thus reinforcing the endogenous growth model.

## **2.2 Empirical Literature**

Most existing studies on the association between government expenditure and economic growth show conflicting results and mainly focus on developed economies. Hence this study focused on both the functional and composition of public spending In Uganda over the period from 2000 to 2023, with a particular focus on sectoral expenditures on education, health and military.

(Chandana et al., 2024) study investigates the impact of Nigerian government expenditure (disaggregated into capital and recurrent) on economic growth using time series data for the period 1970-2019. The paper employs Autoregressive Distributed Lag (ARDL) model. The key findings of the study are that capital expenditure has positive and significant impact on economic growth both in the short run and long run while recurrent expenditure does not have significant impact on economic growth both in the short run and long run.

(Onifade et al., 2020) studied the impact of public expenditures on economic growth have been revisited in this paper with respect to capital expenditure, recurrent expenditure and the government fiscal expansion in line with support for the budgetary allocations to various sectors in the context of the Nigerian economy. Pesaran's ARDL approach has been applied to carry out the impact analysis using annual time-series data from 1981 to 2017. Empirical findings support the existence of a level relationship between public spending indicators and economic growth in Nigeria.

(Magdalena & Suhatman, 2020) used quantitative research and analyzed using multiple linier regression. Collection the variable data by library methods based on secondary data with times series on 1990-2019. Research results show that the Government Expenditures, Domestic Investment, and Foreign Investment for simultante had significant effect and positive to the Economic Growth of Primary Sector. For while partial that the Government Expenditures has

significant effect and positive to the Economic Growth of Primary Sector meanwhile Domestic Investment and Foreign Investment has not significant effect.

(Buthelezi, 2023) used the Vector-error correction (VEC) and Markov-switching dynamic regression with the data from 1994 to 2021. The significance of the paper is that it assessed the short and long-run impacts of government expenditure on different states of economic growth in South Africa. It is found that more government expenditure in South Africa hasn't resulted in the nation's economy growing, which is at odds with the Keynesian viewpoint. In both lower economic states, government expenditure reduces economic growth by 0.009% and 0.30%.

A study focusing on South Africa found that a 1% increase in government expenditure in the short run significantly increased economic growth by 0.15%, highlighting the positive impact of public spending on economic performance Buthelezi (2023).

Nguyen et al. (2020) conducted research on Sub-Saharan Africa using generalized method of moments (GMM) and threshold model to estimate research models and the findings indicated that both recurrent government expenditures and public debt had significant negative impacts on economic growth, suggesting that the nature and management of expenditures are crucial determinants of their effectiveness.

Study by Nguyen and Bui (2022) using system Generalized method of moments have explored the role of corruption control in moderating the impact of government expenditure on economic growth, emphasizing that the effectiveness of public spending is often contingent upon governance quality. The estimation results show that government expenditure and corruption control have a negative impact on economic growth.

An International Monetary Fund (IMF) study analyzed the impact of government capital expenditure on growth in developing nations. The findings suggest that while social expenditures may have a significant short-term impact on growth, infrastructure expenditures might have limited influence Dudzevičiūtė et al. (2018).

Research focusing on Nigeria used ARDL and the results indicated that government expenditure has a positive but insignificant relationship with economic growth. This suggests that while public spending exists, it may not be effectively contributing to economic expansion Poku et al. (2022).

A study by Onifade et al. (2020) using ARDL examining Sub-Saharan African countries found that both recurrent government expenditures and public debt have significant negative impacts

on economic growth. This highlights the potential adverse effects of unsustainable fiscal policies in the region

## CHAPTER THREE

### METHODOLOGY

This chapter outline the methodology used by the study to analysis the effect of government expenditure on economic growth in Uganda. It specifies the theoretical model and empirical mode, estimation strategy, definitions of variables, data type and source.

#### 3.1 Theoretical model

The Endogenous Growth Theory Pack (1994) emphasizes that economic growth is driven by factors internal to the economy, particularly investment in human capital, innovation, and knowledge. Government expenditure plays a pivotal role in enhancing productivity and fostering growth by improving public infrastructure, education, and health. These expenditures directly influence the production process and the economy's ability to sustain long-term growth.

From the basic structure of a growth model, we start with the aggregate production function

$$Y_t = A_t F(K_t L_t G_t) \dots\dots\dots 1$$

Where  $Y_t$  represent output (GDP) at time t,  $A_t$  is the total factor productivity representing technological progress at time t,  $K_t$  is the capital stock,  $L_t$  is the labor input, and  $G_t$  is the aggregate government expenditure

Government expenditure is disaggregated into;

$$G_t = G_{educ,t} + G_{health,t} + G_{military,t} + G_{others,t} \dots\dots\dots 2$$

Where

$G_{educ,t}$  Expenditure on education enhances human capital and labor productivity

$G_{health,t}$  Expenditure on health improves labor efficiency and workforce participation

$G_{military,t}$  Expenditure on defense and security, which may have mixed effects depending on its usage.

$G_{others,t}$  Expenditures not directly categorized but still impactful

The production function then becomes

$$Y_t = A_t F K_t^\alpha L_t^\beta (G_{educ,t} + G_{health,t} + G_{military,t} + G_{others,t})^\gamma$$

.....3

To align with growth theory and capture the dynamic effects, we take the rate of change of the production function. The growth rate of  $Y_t$  (economic growth,  $gY$ ) is expressed as;

$$gY = gA + \alpha gK + \beta gL + \gamma gG$$

.....4

$$gY = \frac{\Delta Y_t}{Y_t}$$

Growth rate of GDP

$gA$  Growth rate of TFP (capturing exogenous technological improvements)

$gK, gL, gG$  Growth rates of capital, labor, and government expenditure components, respectively.

Expanding  $gG$  to include the disaggregated components of government expenditure

$$gY = gA + \alpha gK + \beta gL + \gamma_1 g_{educ} + \gamma_2 g_{health} + \gamma_3 g_{military} + \gamma_4 g_{others}$$

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### 3.2 Variable Description and Data Sources.

This study utilized secondary data and covered the period from 1992 to 2022 and it is time series. The World Development Indicators (WDI) provides invaluable statistical data for most of the macro economic variables invoked. There is a preference for statistical data from the WDI given the inconsistency of the data in Uganda on some of the key variables from the Ministry of Finance Planning and Economic Development and Bank of Uganda especially on debt.

Table 1: *Shows variables description and data sources*

Variable (symbol)	Definition	Source	Justification
GDP growth (annual %)	Annual percentage growth rate of GDP at market prices based on constant local currency	World Bank (WDI)	This is the dependent variable of interest and a standard measure of economic performance.
Health expenditure	Estimates of current health expenditures including healthcare goods and services consumed during each year. This indicator does not include capital	World Bank (WDI)	Health spending contributes to human capital development. In Uganda,

	health expenditures such as buildings, machinery, IT and stocks of vaccines for emergency or outbreaks.		increased health investment has shown potential in improving labor productivity and resilience, especially during public health crises like COVID-19.
Trade (% of GDP)	This study will use the sum of exports and imports to GDP ratio as a proxy for trade openness	World Bank (WDI)	Trade openness is included to control for the external economic environment, which can influence domestic economic growth. Uganda's liberalization policies since the 1990s make this variable relevant.
Military expenditure	Includes all current and capital expenditures on the armed forces, including peacekeeping forces; defense ministries and other government agencies engaged in defense projects; paramilitary forces, if these are judged to be trained and equipped for military	World Bank (WDI)	Military spending is controversial. In Uganda's context, while it may ensure national stability important for economic activity its inclusion requires caution
Population growth rate	This is the rate at which the number of individuals in a population increases in a given time period, expressed as a fraction of the initial population	World Bank (WDI)	Population dynamics influence labor supply and public service demand. Rapid population growth in Uganda creates both opportunities and fiscal pressures.
Total debt service	Total debt service is the sum of principal repayments and interest actually paid in currency	World Bank (WDI)	Debt servicing affects fiscal space and may crowd out productive expenditure. Uganda's rising debt burden makes this a critical control variable.
Education expenditure	Education expenditure refers to the current operating expenditures in education, including wages and salaries and excluding capital investments in buildings and equipment.	World Bank (WDI)	Education enhances human capital and long-term growth potential. In Uganda, programs like UPE and USE

			have expanded access, and their impact warrants empirical analysis.
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### 3.3 Estimation techniques and models

This study employs the Autoregressive Distributed Lag (ARDL) Model to estimate the effect of government expenditure on economic growth. The ARDL model is a robust approach for analyzing the dynamic relationship between variables over time, especially when these variables exhibit mixed orders of integration (i.e., some are stationary,  $I(0)$ , while others are non-stationary,  $I(1)$ ). The ARDL model is well-suited for this study because of its ability to handle variables with mixed integration orders, whether they are  $I(0)$  or  $I(1)$ , making it more flexible compared to other cointegration methods (Pesaran et al., 2001). It is also effective with small sample sizes, ideal for data spanning from 1992 to 2023 (Narayan & Narayan, 2005). Additionally, the ARDL model uses a bounds testing approach to identify long-run relationships and captures both short-run and long-run dynamics, offering a comprehensive understanding of how Government Expenditure influences Economic growth over time Akkemik (2015). Its reparameterization into an Error Correction Model (ECM) further enables analysis of the speed at which the system returns to equilibrium after short-run fluctuations (Engle & Granger, 1987)

#### 3.3.1 Unit root test

In time series analysis, before running the casualty test, the variables were tested for stationarity Gujarati (2014). This is because the use of non-stationary data may lead to spurious results and any interpretation made based on such results becomes meaningless. For this purpose, therefore, the study used Augmented Dickey–Fuller (ADF) unit root test to check whether the variables are non-stationary by taking the null hypothesis as ‘there is the unit root’ against the alternative hypothesis ‘there is no unit root’ Mushtaq (2011).

#### 3.3.2 Augmented Dickey Fuller Unit Root Test

The ADF test is an extension of the original Dickey Fuller test which conveys the unit root test as active even in the presence of autocorrelation of unknown type, such as  $AR(p)$  process. This

ensues after augmenting the ordinary Dickey Fuller equation with lagged values of the differenced dependent variable as expressed below;

$$\Delta Z = \lambda_0 + \lambda_2 t + \rho Z_{t-1} + \sum_{i=1}^q \gamma_i \Delta Z_{t-i} + \varepsilon_t \dots\dots\dots 6$$

Where  $Z_t$  is the time series variables being tested,  $q$  denotes the optimal number of lags and  $\varepsilon_t$  is the stochastic disturbance error term which is assumed to be normally distributed with zero mean and constant variance.

### 3.3.3 Co-integration Test

Despite the fact that individual time series may not be stationary, a linear combination of these variables might be co-integrated. This study utilizes the Pesaran and Shin (1995). ARDL (bounds testing) approach for co-integration, instead of traditional techniques such as the Engle-Granger and Johansen procedures. These older methods often suffer from issues like low power. The OLS-based autoregressive distributed lag (ARDL) model has gained popularity due to its flexibility it can be applied even when variables are integrated of different orders Pesaran and Shin (1995). Additionally, ARDL models take into account sufficient lags to properly capture the data-generating process in a general-to-specific framework (Laurenceson & Chai, 2003). Another key advantage is that a dynamic error correction model (ECM) can be derived from the ARDL model through a simple transformation Banerjee et al. (1998), which allows the integration of short-run dynamics with long-run equilibrium without losing important long-term information. Furthermore, the ARDL approach helps mitigate issues related to non-stationary time series data Laurenceson (2003).

#### Autoregressive Distributed Lag (ARDL) Bounds Testing Approach to Co-integration

This study adopts the ARDL bounds testing approach to examine the impact of government debt on economic growth in Uganda. Invented by Pesaran and Shin (1995), the ARDL approach has several advantages over other estimation techniques. Unlike the Johansen co-integration method, the ARDL approach is effective when variables are integrated of order zero or one. Additionally, it performs well with small sample sizes and provides unbiased estimates, even in the presence of endogeneity (Harris & Sollis, 2003). The ARDL method also allows for the use of variables with different lags and can simultaneously estimate both the short-run and long-run relationships between private investment and other explanatory variables.

$$y_t = \alpha_0 + \sum_{i=1}^p \phi_i y_{t-i} + \sum_{i=0}^q \psi_i x_{t-i} + e_t \quad \dots\dots\dots 7$$

Where  $\phi$  and  $\psi$  represent the coefficients of the lags of the dependent variable and independent variables altogether. The lags in equation 3 indicates a set of dynamic responses in private investment to any given change in the explanatory variables so that there is a sudden change followed by short run and long run dynamic relationships. Then reparametrizing the ARDL model in equation 3.19 gives rise to the Error Correction form of the ARDL as given below;

$$\Delta y_t = \beta_0 - \alpha \left[ y_{t-1} - \theta' x_{t-1} \right] + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{i=0}^{q-1} \lambda_i \Delta x_{t-i} + e_t \quad \dots\dots\dots 8$$

Where  $y$  and  $x$  are private investment and a set of regressors that are assumed to have a significant effect on private investment,  $\alpha = 1 - \sum_{i=1}^p \phi_i$  denotes the speed of adjustment

While coefficient  $\theta = \frac{\sum_{i=0}^q \psi_i}{\alpha}$  is a vector of long run vectors. And  $\gamma$  and  $\lambda$  denote the short run coefficient values and the term in parenthesis is the error correction term as expressed below;

$$ECT_{t-1} = y_{t-1} - \theta' x_{t-1} \quad \dots\dots\dots 9$$

Therefore, the model in equation 7 can be presented as;

$$y_t = \alpha_0 + \sum_{i=1}^{p-1} \gamma_i \Delta y_{t-i} + \sum_{i=0}^{q-1} \lambda_i \Delta x_{t-1} + \phi ECT_{t-1} + e_t \quad \dots\dots\dots 10$$

Where  $\phi = -\alpha$  is the speed of adjustment to the long run equilibrium relationship. Thus,  $\phi$  must be negative and statistically significant to return back to the long run equilibrium relationship. Then  $p$  and  $q$  are the optimal lag orders which can be determined by minimizing the model selection criterion such as through the use of Akaike Information Criteria (AIC) or Schwarz Bayesian Information Criteria (SBIC).

To determine the presence of cointegration among the study variables, the model in equation 13 is estimated using the Ordinary Least Squares Method and then conduct the Wald test (F-statistic) with the null hypothesis that states that there is no cointegration among the variables against the alternative hypothesis that there is cointegration among the variables and this process is known as the bounds test approach to cointegration. Specifically, the null hypothesis for the condensed form of ARDL model is expressed below;

$$H_0^F = (\alpha = 0) \cap \left( \sum_{i=0}^q \psi_i = 0 \right) \dots\dots\dots 11$$

The null hypothesis of no level relationship is rejected if the calculated F-statistic is greater than the upper bound critical value and we fail to reject the null hypothesis if the calculated F-statistic is less than the lower bound critical value. Equally, if the calculated F-statistic lies within the bounds, then we conclude that the test is inconclusive (Pesaran et al., 2001). Thus, it is important to have previous knowledge about the order of integration of the study variables so as to make informed decision about the long run relationship among the variables.

### 3.4 Empirical Model for estimation

Following Mankiw et al. (1992), paper on “a contribution to the Empirics of Economic Growth”, the standard growth model is augmented with variables like public debt; trade openness to assess the impact of public debt on growth economic growth model is presented in

The ARDL estimation technique for our model is represented by the equation below;

$$\begin{aligned} &GDP_t \\ = &\sum_{i=1}^p \beta_1 GDP_{t-i} + \sum_{i=0}^{q_1} \beta_2 HEXP_{t-i} + \sum_{i=0}^{q_2} \beta_3 MEXP_{t-i} + \sum_{i=0}^{q_3} \beta_4 TDS_{t-i} + \sum_{i=0}^{q_4} \beta_5 POP_{t-i} + \sum_{i=0}^{q_5} EDUEXP_{t-i} + \sum_{i=0}^{q_6} TRADE_{t-i} \\ &+ \alpha_1 ECT_{t-1} + \varepsilon_t \dots\dots\dots 12 \end{aligned}$$

Equation 12 reflect the short-term dynamics of government expenditure and its interaction with economic growth and other variables through their lagged values. By incorporating these lags, the ARDL model can evaluate both the immediate and delayed effects of these variables. Additionally, the error correction term  $ECT_{t-1}$  captures the long-term equilibrium relationship,

allowing the model to address both short-term variations and long-term adjustments. The coefficient  $\alpha_1$  measures the speed of adjustment towards the long-run equilibrium. A significant and negative  $\alpha_1$  indicates that deviations from the long-run equilibrium are corrected over time.

The short-term dynamic will be captured by,

$$\Delta HEXP_{t-i} + \Delta MEXP_{t-i} + \Delta TDS_{t-i} + \Delta POP_{t-i} + \Delta EDUEXP_{t-i} + \Delta TRADE_{t-i} + \varepsilon_t$$

## CHAPTER FOUR

### PRESENTATION, INTERPRETATION AND DISCUSSION OF RESULTS

#### 4.1 Introduction

This chapter presents the results of the study based on the study variables adopted. It provides a description of the main study variables, the pairwise correlation between the variables, Stationarity tests, long run relationship, regression results, diagnostic tests, interpretation and discussion of the results.

#### 4.2 Data description

Table 2 below shows the descriptive statistics of the main variables adopted for this study.

*Table 1: Descriptive Statistic*

Variables	mean	Standard dev	minimum	maximum	skewness	kurtosis	Obs
Gross domestic product	6.214851	2.32315	2.951306	11.52324	.4815779	2.409149	31
Health expenditure	5.222557	.7417945	3.798348	6.808902	.2163522	2.854152	31
Military expenditure	1.771316	.5183696	.8851502	2.680234	.2030778	2.036437	31
Total debt service	1.637234	1.260119	.2318741	4.352247	.80343	2.667311	31
Population	3.082469	.2213353	2.712952	3.496468	.381539	1.986362	31
Education expenditure	2.424418	.7191963	1.713568	3.8	.5415906	1.751589	31
Trade	37.48716	5.903891	27.83936	56.25827	1.03097	4.718571	31

*Author's own compilation, source WDI (2023)*

#### Gross Domestic Product

The mean GDP growth rate for the dataset is 6.21%, with a standard deviation of 2.32%. This suggests that economic growth has been relatively stable over the observed years, albeit with some variation. The minimum recorded GDP growth rate is 2.95%, while the maximum reached an impressive 11.52%. A skewness of 0.48 indicates that the distribution of GDP growth rates is slightly right-skewed, implying more observations closer to the lower end of

the scale but with occasional high growth rates. The kurtosis value of 2.41, being close to 3, suggests a distribution that is nearly normal, with mild deviations in the tails. There are 31 observations available for this variable.

### **Health Expenditure**

On average, health expenditure as a percentage of GDP is 5.22%, with a standard deviation of 0.74%. This indicates that health spending has been fairly consistent, with minimal fluctuations across the years. The minimum health expenditure is 3.80%, while the highest recorded value is 6.81%. With a skewness of 0.22, the data distribution is close to symmetric, reflecting a balanced spread of values. The kurtosis of 2.85 is slightly below 3, suggesting a distribution with slightly lighter tails than a normal distribution. The data encompasses 31 observations

### **Military Expenditure**

Military expenditure averages 1.77% of GDP, with a relatively small standard deviation of 0.52%. This indicates limited variation in defense spending over the years. The lowest observed value is 0.89%, while the highest is 2.68%. The skewness value of 0.20 shows a near-symmetric distribution, suggesting that values are evenly distributed around the mean. However, the kurtosis of 2.04 implies a flatter distribution with thinner tails compared to the normal distribution. A total of 31 observations were recorded for this variable.

### **Total Debt Service**

Debt service payments average 1.64% of GDP, with a standard deviation of 1.26%, indicating notable variability in the cost of servicing debt over time. The minimum value is 0.23%, while the maximum is 4.35%. A skewness of 0.80 suggests a moderate right skew, indicating that a few years had significantly higher debt servicing costs. The kurtosis of 2.67 points to a distribution that is close to normal but with slightly lighter tails. This variable also has 31 observations.

### **Population Growth Rate**

The population growth rate has an average value of 3.08% with a very small standard deviation of 0.22%, indicating consistent growth rates across the dataset. The minimum rate observed is 2.71%, and the maximum is 3.50%. With a skewness of 0.38, the data is mildly right-skewed,

implying that slightly more observations fall below the mean. The kurtosis of 1.99 suggests a flatter distribution with fewer extreme values compared to a normal distribution. Thirty-one observations are available for this variable.

### **Education Expenditure**

Education expenditure as a percentage of GDP averages 2.42%, with a standard deviation of 0.72%. This indicates moderate variability in education spending over the years. The lowest recorded value is 1.71%, and the highest is 3.80%. A skewness of 0.54 reveals a mild right skew, suggesting a concentration of observations toward the lower end with a few higher values. The kurtosis of 1.75 suggests a flatter distribution, reflecting limited extreme values. As with other variables, there are 31 observations for this measure.

### **Trade**

The trade variable, representing the percentage of GDP accounted for by trade, has a mean of 37.49% and a standard deviation of 5.90%. This indicates moderate variability in trade activities. The minimum trade value is 27.84%, while the maximum is 56.26%. The skewness of 1.03 indicates a noticeable right skew, suggesting that higher trade values are less common but significant when they occur. A kurtosis of 4.72 indicates a leptokurtic distribution, meaning that the data has heavier tails and more pronounced peaks than a normal distribution. This variable also consists of 31 observations.

### **4.3 Correlation between variables**

The study explores the direction and the strength of the linear relationship between the pairs of Variables used in the study. Table 3 below presents the results of the correlation analysis.

**Table 2: Correlation between variables**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gross domestic Product	1.000						
Education expenditure	0.150*	1.000					
Health expenditure	-	0.561***	1.000				
Military expenditure	0.014	0.044	0.183**	1.000			
Total debt	-0.258***	0.055	-0.078	0.394***	1.000		
Population	-0.097	0.118		-0.016	-0.017	1.000	

Trade	0.236***	0.170*	0.293***	-0.013	-0.347***	0.033	0.123	1.000
*** $p < 0.01$ , ** $p < 0.05$ , * $p < 0.1$			Author's own compilation, source WDI (2023)					

The correlation matrix reveals the strength and direction of the linear relationships between the variables, with significance levels indicated by stars. Gross Domestic Product is positively and weakly correlated with education expenditure (0.150, significant at 10%) and trade (0.236, significant at 1%), suggesting that increased trade activities and educational investment may align with higher economic growth. However, GDP is negatively associated with military expenditure (-0.258, significant at 1%) and total debt (-0.185, significant at 5%), implying that higher defense spending and debt may hinder economic growth. Education expenditure has a strong positive correlation with health expenditure (0.561, significant at 1%), indicating a potential synergy between investments in education and health. Health expenditure also shows a moderate positive association with population growth (0.293, significant at 1%) and military expenditure (0.183, significant at 5%), suggesting that higher health spending aligns with population dynamics and defense budgets. Military expenditure is positively related to total debt (0.394, significant at 1%), reflecting the potential financial strain of defense spending. Meanwhile, trade exhibits a negative relationship with military expenditure (-0.347, significant at 1%), indicating that higher trade activities may coincide with reduced defense allocations. Most other correlations are weak or insignificant, highlighting minimal linear relationships among those pairs.

#### 4.4 Unit root test

*Table 3: Unit root test results for (Augmented Dickey –Fuller and Phillips Perron test)*

Variables	Augmented Dickey-Fuller					Phillips Perron				
	Lags	Test Statistic	Critical value (5%)	Test Statistic	Critical value (5%)	Level	Critical value (5%)	Test Statistic	Critical value (5%)	Order of integration
Gross domestic product	1	-3.607	-3.780	-	-	-	-3.580	-5.085	-3.584*	I (1)
Military expenditure	1	-2.958	-3.584	-4.386	-3.588***	5.223	-	-4.857	-3.584***	I (1)
Total debt service	2	-0.675	-3.588	-3.752	-3.580*	2.649	3.580	-9.552	-3.584***	I (1)
						0.757				

Population	2	-3.299	-3.580	-3.848	-3.576 *	-	-3.572	-3.848	-3.576*	I (1)
						1.952				
Trade	2	-1.223	-3.580	-3.584	-3.576 *	-	-3.572	-3.702	-3.576*	I (1)
						0.872				
Health expenditure	1	-2.397	-	-	-	-	-3.572	-	-	I (0)
			1.706*			5.015				
Exports	1	-2.609	-3.576	-4.622	-3.58***	-	-3.572	-6.320	-3.57***	I (1)
						2.904				
Education expenditure	1	-1.999	-3.576	-5.015	-3.58***	-	-3.572	-7.155	-3.57***	I (1)
						2.576				

*Source: Author's computations from WDI 2023 data.*

At the level form, the Augmented Dickey-Fuller (ADF) test for gross domestic product (GDP) produces a test statistic of -3.607, which is not significant compared to the critical value of -3.780, indicating non-stationarity. However, at the first difference, the test statistic becomes -6.164, which is significantly lower than the critical value of -3.588, showing that GDP becomes stationary. In addition, the Phillips-Perron (PP) test confirms this outcome, as the test statistic at the level, -5.223, is not significant compared to the critical value of -3.580 but achieves significance after differencing. Thus, GDP is integrated of order one, I(1).

Similarly, the ADF test for military expenditure shows that the level test statistic of -2.958 is greater than the critical value of -3.584, suggesting non-stationarity. However, at the first difference, the test statistic decreases to -4.386, which exceeds the critical value of -3.588, confirming stationarity. Furthermore, the PP test corroborates these results, as the test statistic at the first difference is -4.857, which is lower than the critical value of -3.584. Therefore, military expenditure is also I(1).

For total debt service, the ADF test at the level reports a test statistic of -0.675, which is higher than the critical value of -3.588, indicating non-stationarity. However, after differencing, the test statistic improves significantly to -3.752, which is lower than the critical value of -3.580, demonstrating stationarity. More so, the PP test shows consistent results, with a test statistic of -0.757 at the level, which is greater than the critical value of -3.580, but a significantly lower test statistic of -9.552 at the first difference, confirming stationarity. As a result, total debt service is I(1).

The ADF test for population also reveals non-stationarity at the level, with a test statistic of -3.299, which does not exceed the critical value of -3.580. However, after differencing, the test statistic drops to -3.848, surpassing the critical value of -3.576 and indicating stationarity. Further analysis using the PP test supports this conclusion, as the test statistic after differencing

also shows stationarity, with -3.848 being lower than the critical value of -3.576. This means population is I(1).

Trade exhibits similar behavior, as the ADF test statistic at the level is -1.223, which is higher than the critical value of -3.580, indicating non-stationarity. At the first difference, the statistic improves to -3.584, which matches the critical value of -3.576, suggesting stationarity. Furthermore, the PP test aligns with this finding, as the test statistic at the level (-0.872) fails to show stationarity, but at the first difference, the statistic decreases to -3.702, which is lower than the critical value of -3.576. Thus, trade is also I(1).

In contrast, health expenditure shows stationarity at the level, as the ADF test statistic of -2.397 is lower than the critical value of -1.706, indicating significance. Furthermore, the PP test confirms stationarity, with a test statistic of -5.015, which is significantly lower than the critical value of -3.572. This implies that health expenditure is stationary at the level and is integrated of order zero, I(0).

Exports initially display non-stationarity, as the ADF test statistic at the level is -2.609, which is higher than the critical value of -3.576. However, at the first difference, the test statistic decreases to -4.622, which surpasses the critical value of -3.580, showing stationarity. Additionally, the PP test results confirm this outcome, as the test statistic at the level is -2.904, failing to indicate stationarity, but the test statistic at the first difference, -6.320, is significantly lower than the critical value of -3.570. Thus, exports are I(1).

Education expenditure also starts as non-stationary at the level, with an ADF test statistic of -1.999, which is greater than the critical value of -3.576. However, at the first difference, the test statistic improves to -5.015, which is lower than the critical value of -3.580, indicating stationarity. Moreover, the PP test produces consistent results, as the level statistic of -2.576 does not confirm stationarity, but the statistic after differencing, -7.155, significantly exceeds the critical value of -3.570. Therefore, education expenditure is I(1).

In summary, while health expenditure is stationary at the level and classified as I(0), all other variables GDP, military expenditure, total debt service, population, trade, exports, and education expenditure become stationary only after differencing, making them I(1).

#### 4.5 Selection of optimal lags

The optimal lags for the study variables are determined using Schwarz's Bayesian Information Criterion (SBIC). SBIC is chosen because it provides consistent and parsimonious estimates of

the true lag order, unlike the Akaike Information Criterion and final prediction error, which often overestimate the true lag order. The study estimates the ARDL model allowing for a maximum of one lag. The SBIC lags specifications for the variables are: Model (11 1 2 1 0 1)

#### 4.6 Long-run relationship

The study conducts a bounds test for co-integration, as proposed by Pesaran et al. (2001), to investigate the existence of a long-run relationship between the variables in the model. The results of the bounds test confirm the existence of a level relationship among the variables since the F-statistic is above the upper bound at all levels of significance suggesting the rejection of the null hypothesis of no level relationship. (See table 5)

**Table 5. Bounds Tests for Co-integration**

F-Statistic	7.272
10 % (lower bound, upper bound)	(3.15 4.43)
5% (lower bound, upper bound)	(2.45 3.61)
2.5% (lower bound, upper bound)	(2.14 3.30)
1% (lower bound, upper bound)	(2.12 3.23)

Author's own compilation, Source: WDI data

The reported F-statistic of 7.272 exceeds the critical upper bound values at all significance levels (10%, 5%, 2.5%, and 1%). For instance, at the 10% level, the upper bound critical value is 4.43, and at the 5% level, it is 3.61. Similarly, at the more stringent 2.5% and 1% levels, the upper bounds are 3.30 and 3.23, respectively. Since the F-statistic is greater than these upper bounds, we reject the null hypothesis of no cointegration. This indicates that a long-run relationship exists among the variables in the model. Moreover, the fact that the F-statistic is significantly higher than even the upper bound at the strictest significance level (1%) provides strong evidence in favor of cointegration, suggesting that the variables are moving together in the long run despite potential short-run deviations.

**Table 6: ARDL estimation results for the effects of public expenditure on economic growth in Uganda**

Error correction model	- .6510 <sup>***</sup> (0.260)
<b>Long run</b>	
Health expenditure	1.436 <sup>**</sup> (0.669)
Military expenditure	-1.050(0.699)
Total debt service	1.458 <sup>***</sup> (0.428)
Population	-1.640(1.835)
Education expenditure	0.669 <sup>*</sup> (0.378)
Trade	0.120 <sup>**</sup> (0.0491)
<b>Short run</b>	
Lags of gross domestic product	0.452 <sup>**</sup> (0.175)
Lags of health expenditure	-1.405(0.981)
Lags of military expenditure	3.856 <sup>***</sup> (1.021)
First lags of total debt service	-1.640 <sup>***</sup> (0.528)
Second lags of debt service	-0.885 <sup>*</sup> (0.460)
Lags of population	-1.725(2.655)
Lags of education expenditure	3.057 <sup>**</sup> (1.366)
Constant	-3.839(13.14)
Observations	29
R square	0.840
Adjusted R square	0.681

Standard errors in parentheses

\*  $P < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ , Where \*, \*\* and \*\*\* denote 10%, 5% and 1% respectively

### **Interpretation and discussion of results**

The study reveals that the **error correction term** (-0.6510) is significant at the 1% level, indicating that about 65.10% of deviations from long-run equilibrium are corrected each period. This confirms that Uganda's economic system exhibits a strong **tendency to revert to long-run growth equilibrium**, validating the appropriateness of an error correction framework for analyzing fiscal dynamics.

### **Health Expenditure**

The long-run coefficient on health expenditure is **positive (1.436)** and significant at the 5% level, suggesting that increased spending on health boosts economic growth. This supports prior literature (e.g., Baldacci et al., 2008), but further analysis is necessary to understand the real-world implications of this spending. Uganda's health sector faces persistent challenges such as underfunding of rural health facilities, low doctor-to-patient ratios, and issues in

procurement and distribution of essential medicines. These may **limit the absorptive capacity** of the health sector, meaning that increased budget allocations do not always translate to proportional improvements in health outcomes or productivity. Thus, while the correlation with growth is positive, inefficiencies could dampen the potential gains.

### **Education Expenditure**

Education expenditure also shows a positive long-run impact (0.669), **significant at the 10%** level. In the short run, it has a stronger influence (3.057, 5% significance). These findings reflect the transformative role of education spending, particularly in boosting short-term productivity and long-term human capital. However, Uganda's education sector suffers **from** overcrowded classrooms, teacher absenteeism, **and** low learning outcomes, **which raise questions about the** efficiency and quality of service delivery. The relatively modest long-run effect, compared to the short-run, may point to diminishing returns if educational investments are not matched with quality improvements in teaching and infrastructure. Therefore, the effectiveness of spending, not just the quantity, becomes crucial.

### **Military Expenditure**

Military expenditure has an insignificant negative long-run effect (-1.050), **but a** significant positive short-run lag effect (3.856). This suggests a divergence between immediate economic stimulation (possibly through defense procurement and wages) and the long-run opportunity costs, where spending may crowd out more productive investments in health, education, or infrastructure. Given Uganda's recent emphasis on security spending, particularly in border regions and internal deployments, this pattern calls for **a reassessment of long-term fiscal priorities** to ensure alignment with development objectives.

### **Debt Service**

Interestingly, total debt service shows a **positive and significant long-run coefficient (1.458)** but **negative short-run effects (-1.640 and -0.885)**. This indicates that while debt servicing may reflect **disciplined fiscal management in the long run**, it imposes **short-term liquidity constraints**, potentially limiting space for capital or social investments. These results underscore the importance of **balancing debt obligations with adequate public investment**, echoing findings by Pattillo et al. (2004) and Reinhart & Rogoff (2010).

## Population Growth

Population has an insignificant negative **impact** in both long and short runs. While Uganda's youthful population could offer a demographic dividend, **current unemployment rates**, underemployment, and education gaps prevent this potential from being fully realized. Policies that improve the quality of the labor force, including vocational training and employment opportunities, may be necessary to turn this neutral/negative dynamic into a growth engine.

## Trade Openness

Trade openness positively and significantly contributes to long-run growth (0.120). This aligns with the view that integration into global markets fosters competitiveness and access to technology. For Uganda, enhancing trade infrastructure (e.g., transport corridors, border efficiency) and addressing non-tariff barriers could further amplify these benefits.

*Table 7: Diagnostics tests on ARDL Model*

Statistical Test	Nature of text	Critical values	Decision
<b>Serial correlation</b>	Durbin-Watson	= 2.785	No serial correlation
<b>Heteroscedasticity</b>	White's test	Prob > chi2 = 0.413	No Heteroscedasticity
<b>Ramsey RESET</b>	Ramsey RESET	Prob >F = 0.793	no omitted variables
<b>Multicollinearity</b>	Mean VIF)	1.65	No Multicollinearity
<b>Autocorrelation</b>	Breusch-Godfrey LM test	0.170	No autocorrelation
<b>Normality</b>	sktest resid	Prob>chi2 = 0.443	Normally distributed

*Author's own compilation, source, WDI data*

The Durbin-Watson test examines serial correlation in the residuals of the regression model. The null hypothesis assumes no serial correlation, while the alternative hypothesis suggests the presence of serial correlation. The reported Durbin-Watson statistic is 2.785, which lies in the range indicating no serial correlation. This result implies that the residuals are independent,

meaning the model does not suffer from autocorrelation, and the estimated coefficients are unbiased and efficient.

White's test is used to check for heteroscedasticity, where the null hypothesis states that the residuals have constant variance (homoscedasticity). The p-value for White's test is 0.413, which is greater than the conventional significance levels (e.g., 0.05). As such, we fail to reject the null hypothesis, concluding that there is no evidence of heteroscedasticity in the model. This finding suggests that the variance of errors is consistent, and the model's estimates remain reliable.

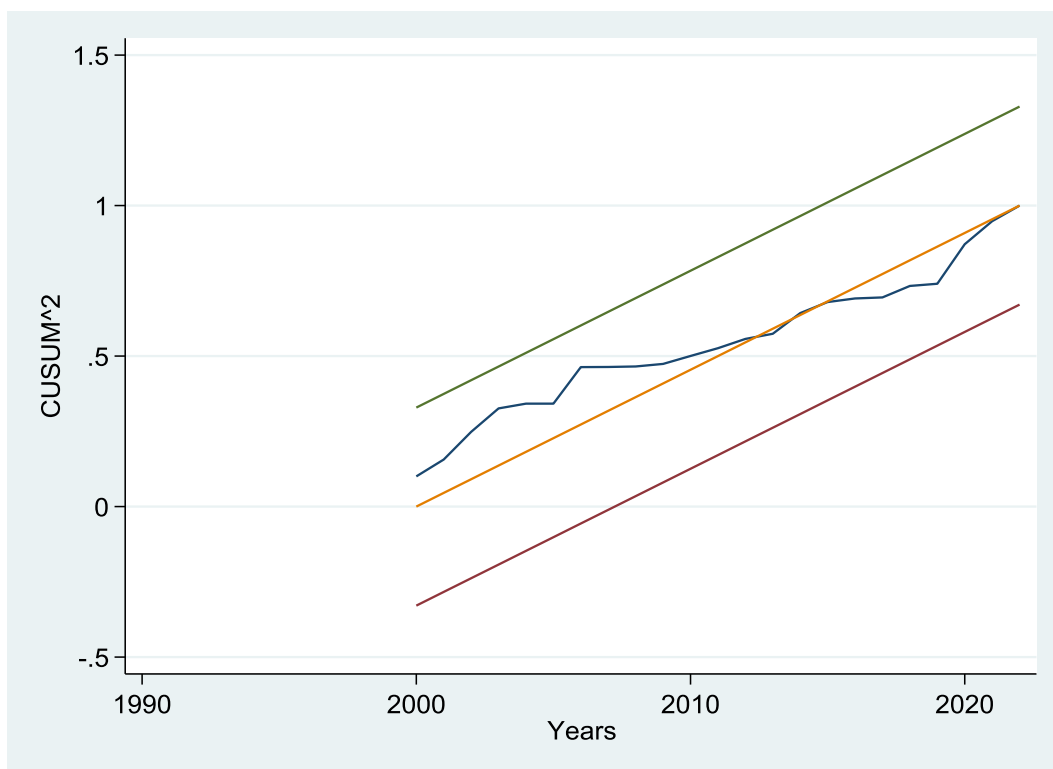
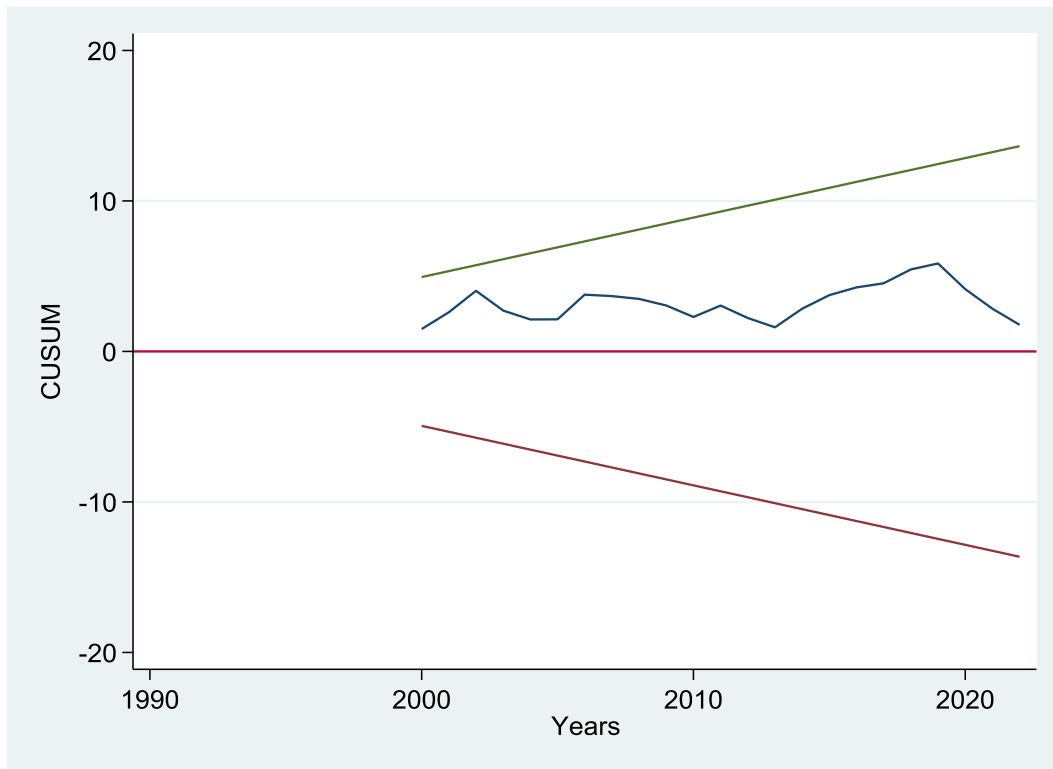
The Ramsey RESET test evaluates model specification, specifically testing for omitted variables or incorrect functional form. The null hypothesis is that the model is correctly specified, while the alternative suggests omitted variables or functional form misspecification. With a p-value of 0.793, we fail to reject the null hypothesis, indicating no evidence of omitted variables. This result confirms the adequacy of the model's functional form in capturing the relationships between the variables.

The Variance Inflation Factor (VIF) assesses multicollinearity among the independent variables. The null hypothesis assumes no multicollinearity, and a mean VIF of 1.65 is well below the critical threshold of 10, indicating low multicollinearity. This suggests that the independent variables in the model are not highly correlated, ensuring that the coefficient estimates are stable and interpretable.

The Breusch-Godfrey LM test checks for autocorrelation in the residuals. The null hypothesis posits no autocorrelation, while the alternative suggests its presence. The reported p-value of 0.170 exceeds common significance levels, leading to the conclusion that there is no evidence of autocorrelation. This result supports the assumption of independent residuals, enhancing the credibility of the regression results.

The Skewness-Kurtosis (sktest) test evaluates the normality of residuals. The null hypothesis is that the residuals are normally distributed. The reported p-value of 0.443 is greater than the standard significance levels, meaning we fail to reject the null hypothesis. This confirms that the residuals follow a normal distribution, satisfying one of the key assumptions for valid hypothesis testing and inference in regression models.

**Figure 2: Test for Stability of the ARDL model (CUSUM test)**



To examine the stability of the model, the study call on the famous cumulative summations' plot (Cusum9) in figure 3 above, since the Cusum9 curve above is bound between 5% of the

distribution in the short run over the study period, then we conclude that the estimated ARDL model is stable and it satisfies, most of the principal elements of econometric diagnostic tests to be fit for estimation. This result is supported by additional diagnostic tests reported in table 7. Looking at the model significance from the above simple model in table 6, R-square of 0.840, this is evidence that the variables included in the model collectively explain over 83% of the variation observed in the youth unemployment rates in the model.

## CHAPTER FIVE

### CONCLUSION, RECOMMENDATION, LIMITATIONS AND AREAS FOR FURTHER EXPLORATION

#### 5.0 Introduction

This chapter summarizes the principal findings of the study, draws conclusions based on the analysis, and provides recommendations for policymakers to enhance economic growth in Uganda, and the limitations of the study. The study's insights are intended to guide strategic interventions and inform future research

#### 5.1 Conclusion

The findings underscore the pivotal role of targeted government expenditure in fostering economic growth, particularly through investments in health and education. Health expenditure demonstrates a robust positive long-run impact, reflecting its significance in enhancing labor productivity and promoting sustainable growth. Similarly, education expenditure, though slightly less pronounced, contributes positively to economic performance by fostering human capital development. These results align with existing literature, highlighting the importance of social spending in driving economic progress. Trade openness also emerges as a critical driver of growth, emphasizing the need for policies that enhance market integration and resource efficiency. Conversely, the insignificant role of population dynamics suggests that demographic factors alone are insufficient to spur growth without complementary structural and economic policies.

The analysis reveals nuanced short- and long-term dynamics of fiscal policies. While debt servicing positively impacts long-run growth, its short-term effects are detrimental, reflecting fiscal constraints. Military expenditure presents mixed results, with a positive short-term effect that does not translate into long-term growth benefits, emphasizing the need for strategic allocation of resources. Overall, the model's high explanatory power and significant error correction term indicates the stability and resilience of the growth trajectory, supported by effective public expenditure management. Policymakers should prioritize investments in health, education, and trade facilitation, while carefully balancing debt obligations and military spending to sustain long-term economic growth.

## 5.2 Policy recommendation

To harness the positive effects of public expenditure on economic growth, the Ugandan government should not only prioritize increasing budget allocations to health and education but also implement strategies to enhance the efficiency and impact of this spending. In the health sector, this involves strengthening governance systems to improve transparency in procurement and service delivery, targeting investments toward underserved rural areas and primary healthcare facilities, and building the capacity of health personnel through comprehensive training and retention programs. In education, the government should focus on expanding technical and vocational training programs aligned with labor market demands, improving teacher training and supervision to boost learning outcomes, and enhancing infrastructure and digital learning tools, especially in remote areas.

Addressing short-term fiscal constraints posed by debt servicing requires practical measures such as improving domestic revenue mobilization through tax reforms and broadening the tax base, ensuring that borrowed funds are directed toward high-return, growth-enhancing investments, and where necessary, negotiating for concessional loan terms or debt restructuring. Additionally, adopting phased expenditure frameworks can help prioritize critical sectors like health and education while maintaining overall fiscal discipline. These strategies will strengthen the absorptive capacity of key sectors, ensure value-for-money in public spending, and foster sustainable economic growth even in the face of fiscal limitations.

## 5.3 The study acknowledges several limitations and areas for further exploration.

The study acknowledges several limitations that may affect the robustness and generalizability of its findings, and a more detailed exploration of these limitations is essential for transparency and for guiding future research. One key limitation is the **absence of potentially influential variables** due to data availability constraints. Notably, factors such as **institutional quality**, **governance indicators**, and **technological advancement**, which are known to significantly influence the relationship between government expenditure and economic growth, were not included in the analysis. This omission could lead to **omitted variable bias**, as the exclusion of such critical factors may distort the estimated effects of public expenditure on economic growth. Moreover, the **lack of disaggregated data** on specific categories of public expenditure, such as infrastructure development and social protection programs, limits the study's ability to offer granular insights into how targeted spending in particular sectors can impact growth. For example, the impact of infrastructure investment on economic growth may

differ significantly from that of social protection programs, and the lack of data on these distinctions reduces the depth of analysis.

Another important data limitation is the reliance on secondary data from sources like the World Bank and the Ministry of Finance, which may not fully capture Uganda's unique fiscal and economic context. This reliance on external datasets can introduce potential measurement **errors** or **biases** stemming from inconsistencies in reporting, especially in developing countries where data collection may be sporadic or incomplete. Additionally, methodological **constraints** in the study's modeling approach—such as the use of aggregate public expenditure variables—may mask the nuanced effects of sector-specific expenditures. These constraints suggest that future research could benefit from exploring more detailed datasets that capture the full spectrum of public spending, potentially including regional variations, and more advanced econometric models that address potential endogeneity issues.

Looking ahead, **future research** should aim to explore the **sectoral allocation** of government expenditure in greater detail to assess which specific sub-sectors within health and education yield the highest returns to economic growth. This would provide more actionable insights into optimizing public investment strategies. Furthermore, future studies could examine the interplay between government expenditure, institutional quality, and economic growth by incorporating governance variables such as transparency, accountability, and efficiency in public spending. Investigating how these governance factors influence the effectiveness of fiscal policies could reveal critical insights for improving the design and implementation of public spending programs that promote sustainable development. Addressing these limitations and expanding the scope of analysis would enhance the **comprehensiveness** of the findings and ensure that the study's conclusions are more robust and applicable in different contexts.

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