GOVERNMENT DEVELOPMENT EXPENDITURE AND ECONOMIC GROWTH NEXUS IN UGANDA

BY

MUHANGI BERNARD

19/U/GAEE/20727/PE

A DISSERTATION SUBMITTED TO THE DIRECTORATE OF RESEARCH AND GRADUATE TRAINING IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF A DEGREE OF MASTER OF ARTS IN ECONOMICS OF KYAMBOGO UNIVERSITY

OCTOBER, 2024

DECLARATION

I, **MUHANGI BERNARD**, hereby declare that this dissertation report titled *"**GOVERNMENT DEVELOPMENT EXPENDITURE AND ECONOMIC GROWTH NEXUS IN UGANDA"*** is my original work and has not been presented for any other award in any other university or institution.

Signature …… Date ……

MUHANGI BERNARD

19/U/GAEE/20727/PE

APPROVAL

We as University Supervisors confirm that the dissertation titled "***GOVERNMENT DEVELOPMENT EXPENDITURE AND ECONOMIC GROWTH NEXUS IN UGANDA"*** has been done by the candidate under our supervision.

PROF. OKURUT FRANCIS NATHAN (Deceased)

Date……..…

Signature…….

Department of economics, Faculty of Social Sciences, Kyambogo University

TUMWEBAZE HENRY (PhD)

Date……

Signature……

Department of economics, Faculty of Social Sciences, Kyambogo University

DEDICATION

This work is dedicated to my wife Mrs. HABASA GERTRUDE MUHANGI for her strong desire and encouragement she rendered to me to pursue this master's programme and my children Tierney, Nicole, Teclor and Noble.

ACKNOWLEDGEMENT

Greatest gratitude to the Almighty God for the provision of good health during the writing of this dissertation. Special thanks to my supervisors Prof. Okurut Francis Nathan (Late) and Dr. Henry Tumwebaze for timely response, guidance, constructive criticism and most importantly accepting to be my supervisors for this study.

The contributions of Dr. Kenneth Tindimwebwa, Dr. Lillian Namubiru, Dr. Fred Muhumuza, Dr. Francis Waiswa, Dr. Wilfred Nahamya, Dr. Dickson Turyareeba, Dr. Norman Tumwine, Dr. John Sseruyange, Dr. Godfrey Okoboi and the entire post graduate teaching staff in the Department of Economics Kyambogo University cannot be taken for granted.

I do also would like to extend my sincere gratitude to my course mates: Mugisha Innocent, Okello Felix, Kabugo Robert, Nabulele Moses, Angulo Chris Dennis, Arinaitwe Julius and Okello Patrick whose persistence in the course gave me the courage to keep going.

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LIST OF ABBREVIATIONS AND ACRONYMS

ADF	Augment Dickey-fuller
AIC	Akaike's Information criterion
AR	Autoregressive
ARDL	Autoregressive Distribution Lag
DW	Durbin Watson
MoFP&ED	Ministry of Finance Planning and Economic Development
ECM	Error Correction Model
EG	Economic Growth
EXRATE	Exchange Rate
FDI	Foreign Direct Investment
GDP	Growth Domestic Product
GFCF	Gross Fixed Capital Formation
INF	Inflation
IMF	International Monetary Fund
LM	Lagrange Multiplier
LRATE	Lending Rate
OLS	Ordinary Least Square
PP	Philip Perron
SBIC	Schwarz's Bayesian information criterion
VAR	Vector Autoregressive
VEC	Vector Error Correction
BoU	Bank of Uganda
UBOS	Uganda Bureau of Statistics
WB	World Bank

ABSTRACT

The study investigated the direction of causality as well as cause-effect relationship between development expenditure and Uganda's economic growth using the Vector Autoregressive (VAR) model and the generalized method of movements (GMM) respectively. Quarterly data for the period 2008 quarter 3 to 2022 quarter 3 were used in the analysis. The data was sourced from Ministry of Finance, Planning and Economic Development and from Bank of Uganda. Findings from the VAR and the subsequent Granger Wald causality test results suggest that there is a uni-directional causality running from economic growth to development expenditure. Estimates from the GMM model indicate that whereas variations in development expenditure have no causal effect on Uganda's economic growth, the variations in gross fixed capital formation and the variations in debt service had a significant influence on Uganda's economic growth. On policy stance, we argue that Uganda's economic growth could be enhanced from increased development expenditure if government could carefully scrutinize and prioritize public investment projects financed by development expenditure to avoid the "white-elephant" hypothesis. Additionally, Uganda's economic growth can be enhanced through devising strategies that increase on gross fixed capital formation and strategies that enhance domestic tax revenue collection in order to cut on dent servicing.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter lays down the introduction, background, problem statement, study objectives, hypothesis, and study significance are the main components of this chapter.

1.1 Background

Spending by Government can be referred to as a term that describes money used by government to purchase goods and services including social security, healthcare, and education. Spending on goods and services (consumption spending) and public investment spending are the two categories of government expenditure made on infrastructure, education, public health, research and development, and other expenditures that are conducive to raising business productivity. According to several empirical research, boosting public investment decreases corporate costs and boosts firm profitability, which in turn raises the long-run growth rate. (Nyasha & Odhiambo, 2019; Rodrguez-Pose & Ezcurra, 2011).

Over the time, Uganda has been putting more budget allocation to cater for both development (Budget Framework paper, 2020) and recurrent expenditures. Among the development expenditures that the government of Uganda has been investing in infrastructure development, health expenditure, electricity, educational expenditures, expenditure on tourism, acquisition of physical assets and stocks among others whereas the recurrent expenditures have been majorly on, military, salaries and wages, interest payment and compensations. During the past 4 years the budget allocation in every financial year has been tremendously increasing a case in point is the financial year 2020/2021 in which Uganda allocated UGX 16,415 billion for development expenditure whereas for recurrent it was UGX 12,887 billion (Budget Framework Paper, 2020).

Policymakers anticipate massive economic developments as a result of these massive allocations, developing nations invest over $200 billion annually in new infrastructure representing 4.5% of national production, with one-fifth of all their investments (World Bank, 2019). Unfortunately, economic growth has lagged behind despite the increase in government spending, and the majority of developing nations are among the world's poorest (UNDP, 2015). To that purpose, the analysis of macroeconomic fiscal policy has shifted its focus to the

relationship between governmental fiscal policy (operations) and economic growth. Figure 1.1 shows the trends in economic development as measured by GDP growth annually.

Between 1980- 2020 there has been both upward and downward trend with the least development realized in 1985 at -3.3% which is attributed to civil war with highest economic development happening in 1995 at a rate of 11.5%.

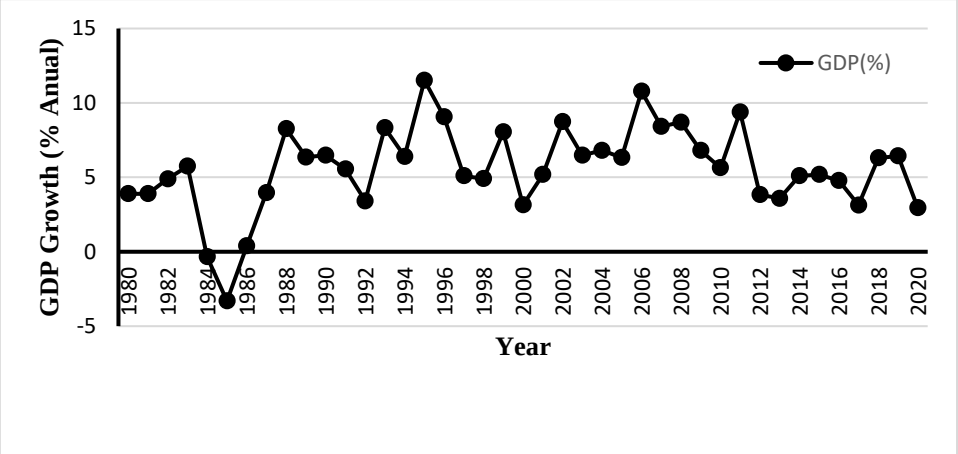

Figure 1. 1*:* Uganda economic growth between 1980-2020.

Sourc*e: Adopted from World Bank*

As a result, the impact of government development expenditure on economic growth is a topic of discussion among economists, decision makers, and politicians. For instance, Wagner (1893) was the first to define his law regarding the "growing development of public and state activities." His law states that greater economic growth has a favorable long-term effect on government spending, especially development spending. In that very line, the Keynesian hypothesis claims that government spending is an exogenous policy tool used to promote economic growth as noted by Keynes (Keynes 1936).

In comparison to other two original East African countries (Kenya and Tanzania), Uganda is the only one that has not yet achieved middle-income status, despite massive budget allocations to development expenditures in each fiscal year (Budget Framework Paper, 2020). The government intends to create future benefits by investing in infrastructure that facilitate the timely delivery of goods and services. Infrastructure deficiencies endanger economic growth and outcomes in many emerging nations, such as those from Africa as noted by (World Bank 1994).

Theoretically, this study introduced a conceptual framework that serves as the foundation for the econometric model. For example, Deaton and Muellbauer's (1980) theory of consumer behavior provides a number of alternative models of government development expenditure. They assume that the government employs a social welfare function that considers both its own spending (on public goods) and private disposable income. They also emphasize the importance of having unlimited borrowing capacity on international capital markets at a given real interest rate.

As a result, the purpose of this research was to determine whether there is a link between government spending and economic growth. This was accomplished by examining empirical data on government spending in relation to economic growth.

1.2 Problem statement

Uganda has gradually increased its budgetary allocation for infrastructure spending over the last ten years (Budget Framework Paper, 2020). Government expenditure is a crucial fiscal policy tool for realizing economic growth targets. As a result, economists, policymakers, and governments are debating the impact of government development expenditure on economic growth. Vision 2040, National Development Plan (NDP) III all emphasize the importance of increasing the quantity and quality of strategic infrastructure to boost the country's competitiveness (NPA,2013; NPA,2020). As a result, government investments are intended to address growth constraints, the most significant of which is Uganda's massive five infrastructure deficit (Budget framework paper, 2019).

Government spending on infrastructure is currently around 32.8% of total government spending, (UIA, 2021). Investment in public infrastructure, for example, stimulates private investment, and despite mounting evidence of underinvestment in public infrastructure, particularly in the aftermath of the debt crisis, no evidence of what determines the level of public investment in infrastructure has been provided. Partly as a result of the development expenditure, Uganda has been on average growing annually at a rate of 5 -7.5% (AfDB, 2022). A quick snapshot of real GDP growth percentages for a few selected years are 6.3%, 6.4% and 3.0% for 2018, 2019 and 2022 respectively which shows up and downward trends in growth and partly the decline is attributed to COVID-19 pandemic (World Bank, 2022).

A research study by Ssempala, Ssebulime, and Twinoburyo (2020) is one of many studies on Uganda's economic growth, but little is said about the connection between government development spending and economic growth. This research sought to bridge the gap on existing scanty literature on the relationship between government development spending and economic growth.

1.3 Objectives of the study

1.3.1 General objective

To investigate the relationship between government development spending and Uganda's economic growth.

1.3.2 Specific objectives of the study

i. To assess the direction of causality between government development expenditure and Uganda’s economic growth.
ii. To investigate the effect of government development expenditure on Uganda’s economic growth.
iii. To investigate other determinants of Uganda’s economic growth.

1.4 Research hypotheses

i. There is a bi-directional causality between government development expenditure and Uganda’s economic growth.
ii. Government development expenditure has a positive and significant impact on Uganda’s economic growth.
iii. Economic growth in Uganda is positively and significantly influenced by foreign direct investment, exchange rates and trade openness, while negatively and significantly influenced by inflation and lending interest rates.

1.5 Scope of the study

The study was organised around content, geographical scope and time scope.

1.5.1 Content scope

The study focused on relation between government development expenditure and economic growth. Other potential determinants of economic growth such as exchange rates, trade openness, inflation and lending interest rates were investigated.

1.5.2 Geographical scope

The study concentrated on Uganda's economy.

1.5.3 Time scope

The study used time series data spanning from 2008 Q3 to 2022 Q3.

1.6 Significance of the study

The study findings are significant to various stake holders such as academicians, policy makers and researchers in the following ways;

i. To the academicians, the study findings will add on the existing literature on effect of government development expenditure on economic growth in Uganda.
ii. To the policy makers, the study findings will help them to develop appropriate policies for supporting the implementation of development projects targeting high levels of economic growth.
iii. The study findings will also help researchers to identify potential research areas by identifying the research gaps.

1.7 Organization of the study

This dissertation is organized under five broad chapters: Chapter One presents the introduction which constitutes the background, problem statement, study objectives, study hypotheses, scope and significance. Chapter Two presents a review of literature in which the theoretical and empirical literature are reviewed. Chapter Three presents the Methodology. Chapter Four is a Presentation, Analysis and Interpretation of the Findings and Chapter Five presents the Summary, Conclusion and Policy Recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter summarizes the theoretical and empirical literature related to the subject area for this study.

2.1 Theoretical literature

The dependent variable under investigation in this study relates to economic growth. The study thus first reviews theoretical literature around the main theories of economic growth that have been advanced by scholars to explain the origins of economic growth. The main theories reviewed in this study include the classical theory, endogenous theory, neo classical theory, the Schumpeterian theory and the institutionalism growth theory. In this subsection, the theory of government development expenditure and economic growth is also reviewed. The last subsection is a review of empirical literature**.**

2.1.1 The Classical theory of economic growth

This theory expresses and considers production as involving labor, produced means of production (Land). The main scholar, Adam smith, analysed the growth process by considering capital accumulation and division of labor as the main determinant of economic growth (Park, 2006). According to Adam smith, the productivity of labor is limitless with labor skills the main determinant of labor productivity in any economy. Division of labor is key to growth of labor productivity which in turn is influenced by market and capital accumulation. Additionally, the classical theory emphasizes the increasing returns in the production process.

Another classical economist David Ricardo analyzed the growth process by concentrating on long term trend of profitability as capital accumulation just like Smith, he emphasized capital accumulation would largely come from profits and neglected the role of wages and rent. Economic theories are yet to establish a consensus on the growth effect of economic integration. Economic growth theories explaining this conclusion can also be broadly categorized into traditional and new economic growth theories, each reflecting a developmental stage in the evolution of the theories. The traditional theories of economic growth explain the possible benefits of growth and are often referred to as classical theory or static analysis of

economic arrangements. The new economic growth theories, which are developed to reflect changing economic conditions and trade environments, are also referred to as dynamic analysis (Hosny, 2013; Dautov et al., 2015).

2.1.2 Neoclassical model of economic growth

The model is based on Frank Ramsey's work which concerns optimization and level of savings. The model was developed by cass- Ramsey- Koopmans model (cass- 1965; koopman 1965). The model emphasizes that the saving rate is endogenous and depends on decisions of consumers. The neoclassical models assume that the economy achieves equilibrium in the long run thus confirming the existence of convergence where the poor countries develop faster compared to rich economies. The convergence hypothesis states that countries differ from each other in their capital labor ratio but the same at steady state. The economy with the lower level of income per capita will eventually obtain a higher rate of growth.

The main determinant of economic growth is formed inside the model such that the technical level of the economy is a result of investment decisions. The benefits to factor inputs of the production process are less constant. Paul Roomer modified the model by including the role of technological progress as the major determinant of economic growth through increasing the supply of intermediate goods, Furthermore economic growth is dependent on Human capital in a way that countries rich in human capital develop faster compared to those in shortage due to economic stagnation (Romer, 1997).

2.1.3 Endogenous growth theory

The endogenous growth theory was introduced by Romer (1986). The endogenous growth theory essentially is based on hypothesis that endogenizes technological change. The basic idea of the endogenous growth theory hinges on the importance of the role of increasing returns. Romer (1986) emphasized that increasing returns and long run growth and have the ability to generate endogenous growth through new knowledge. According to Romer (1986), the new knowledge develops within the economic system and has positive effects in terms of productivity and growth of the product, thus productivity drives growth in output. New knowledge is assumed to be an intangible capital good and fundamental input of production that has increasing marginal productivity.

2.1.4 The institutionalist growth theory

This growth theory was propounded by Acemoglu et al (2005) who propose that institutions are a fundamental cause of long run economic growth. The institutionalist growth theory focuses on the quality of governance and other factors like ethnic diversity, religion and culture and the governance institutions set up in general.

2.1.5 Theory of Government Development Expenditure and Economic Growth

Long-term economic development and the significant increase in government spending in all developed and developing countries have given rise to a wide body of literature that makes numerous efforts to explain the phenomenon. On the one hand, research on public finances has focused on determining the main reasons for the expansion of the public sector (Marica, & Piras, 2018; Henrekson & Lybeck, 1988). Wagner's Law of Public Expenditure is one of the earliest attempts to emphasize economic development as the key factor influencing the growth of the public sector. To put it mildly, there is a vast amount of literature on this subject. According to certain research, the expansion of the public sector and economic growth are significantly positively correlated, but primarily for emerging countries.

Macroeconomics, particularly the Keynesian school of thought, however, places the emphasis in a different location (Landau, 1983). According to the Keynesian theory, the amount of money spent overall has an impact on the economy's output, employment, and inflation, a thought that is seen as a "demand-side" theory (Rodríguez-Pose & Ezcurra, 2011).

2.3 Empirical Literature Review

2.3.1 The relationship between government development expenditure and economic growth

The impact between government expenditure and economic growth is an interesting one as literature has a mixed sentiment. Some scholars report negative whereas others report positive effects of government expenditure on economic growth nexus.

Alfonso and Jalles (2014) used a large country panel to study the fiscal composition-growth nexus while taking into account common econometric errors. The findings indicated that while expenditures have a detrimental impact on growth, revenues have no discernible impact. With the addendum that government money has a detrimental effect on growth, the same is true for

the OECD. According to the findings, income taxes, public employment, interest payments, subsidies, and government consumption do not promote growth. Growth is boosted by spending on health and education, and there is some tenuous evidence that spending, and revenue are causally linked with output.

In East Africa, for example, Tanzania's government spending and economic growth nexus was studied by Paul and Furahisha (2017). The study focused on the applicability of Keynesian theory and Wagner's law in Tanzania. Using time series data spanning from 1978 - 2014, they used co-integration and a vector error correction modeling technique in examining the direction of causality. These study findings supported Keynesian theory by showing that foreign development spending fosters economic growth. In contrast, the research supported Wagner's law by demonstrating that economic expansion raises domestically funded development expenditure. The study employed a standard classification of government spending that took into account the sources of public spending, such as domestic versus international sources.

The SVAR framework was used by Hammed and Arawomo (2020) to analyse how fiscal considerations affect the effects of oil shocks on industrial production in Nigeria using annual time series data from 1981 to 2019.They found that the oil price provides both the short- and long-term explanations of government revenue, despite the fact that the explanation is relatively inadequate. This implies that long-term public spending may generate more money. They also found that the government's spending cannot be justified by its revenue, which may mean that borrowing accounts for the majority of how it is funded. The inadequate explanation supplied by expenditure for variations in price level is another sign that inflation in Nigeria is primarily driven by imports. Finally, the price shocks of oil, revenue, and inflation all contribute to the explanation of industrial production.

Along with the aforementioned author, Nurudeen and Usman (2010) also examined empirically how government expenditure breakdowns affected economic growth in Nigeria from 1979 to 2007. The breakdown of government spending in this investigation included capital, recurring, health, education, transportation, and communication costs. The study's conclusions, which were attained using the co-integration and error correction method, demonstrated that capital projects, ongoing spending, and spending on education all have a negative impact on economic growth in Nigeria.

Butkiewicz and Yanikkaya (2011) empirically examined the impact of aggregated and disaggregated government spending on economic development using a sample of more than 100 industrialized and developing nations. The study's findings, which were based on the Seemingly-Unrelated Regression (SUR) technique, showed that, notwithstanding some anomalies within the sample, aggregate government spending and consumer spending were found to have a negative impact on economic growth in the study countries.

Hasnul (2015) looked studied the relationship between economic growth and government spending in Malaysia from 1970 to 2014. Operation and development costs made up a larger portion of government spending. Government spending, on the other hand, was split up according to the sector to which it was allocated. When adopting an OLS technique, the findings indicated a negative correlation between overall government spending and economic growth in the analysed country. The study's findings also supported the notion that Malaysia's economic growth is negatively impacted by government spending on the housing industry and the development category.

2.3.2 Other determinants of economic growth

In addition to development, there are other factors that influence economic growth: These include trade openness, inflation, interest rates on loans, and foreign direct investment (FDI).

FDI refers to an investment made by a business established in another country that acquires a controlling stake in a business there. Because FDI inflows are a source of funding and capital formation is one of the key factors influencing economic growth, they may have an impact on capital creation. Second, foreign direct investment may boost productivity and alter the comparative advantage of the host nation. FDI would impact GDP and exports if productivity growth was export-biased.

Another study by UNCTAD attempted to evaluate the impact of FDI on growth when other growth-promoting variables were taken into consideration. It was published in the World Investment Report 1999. Ordinary linear regression analysis was used to determine the growth determinants for the study, which included past growth in real per capita GDP, the level of education at the start of the period, changes in the labour force participation rate, investment expenditure as a share of GDP (measured in real terms at each period's current national prices), inward flow of FDI as a percent of nominal GDP, and past growth in real per capita income.

The sample included five time periods between 1970 and 1995 and more than 100 developing nations. Indeed, their research revealed that FDI contributes to economic growth.

Even though exchange rates are occasionally natural, they have an effect on economic expansion. When there are more swings, countries adopt actions like devaluing their own currencies, which is a crucial part of the traditional stabilization program that results in changes to trade policy. Devaluation raises the price of foreign exchange in the domestic currency, which raises the price of traded goods relative to nontraded ones. Resources are consequently redistributed, improving output in sectors that compete with imports. Exchange rates have been found to positively affect economic growth in several studies, including those by Connolly (1983), Gylfason and Schmid (1983), Taylor and Rosensweig (1984), and Kamin (1984). (1988). However, other analyses have also revealed contradicting and divergent findings. For instance, the output response to devaluation appeared to be advantageous over the long term, despite the fact that Edwards (1986) and Rhodd (1993) discovered unfavorable short-term consequences.

However, inflation and lending interest have a detrimental impact on economic growth. For instance, a study by Udoka and Anyingang (2012) that used data from 1970 to 2010 indicated an inverse association between interest rates and economic growth. In order to come to conclusions, the researcher used an ex post facto study design to gather data from the Central Bank of Nigeria using an ordinary least square multiple regression analysis. Additionally, Itodo, Eche, and Kamo (2012) revealed that using the OLS regression technique for data analysis, interest rates have a negligible correlation with economic growth in Nigeria.

2.4 Conceptual Framework

Figure 1.2 below is a representation of the conceptual framework that shows the relationship between the study variables.

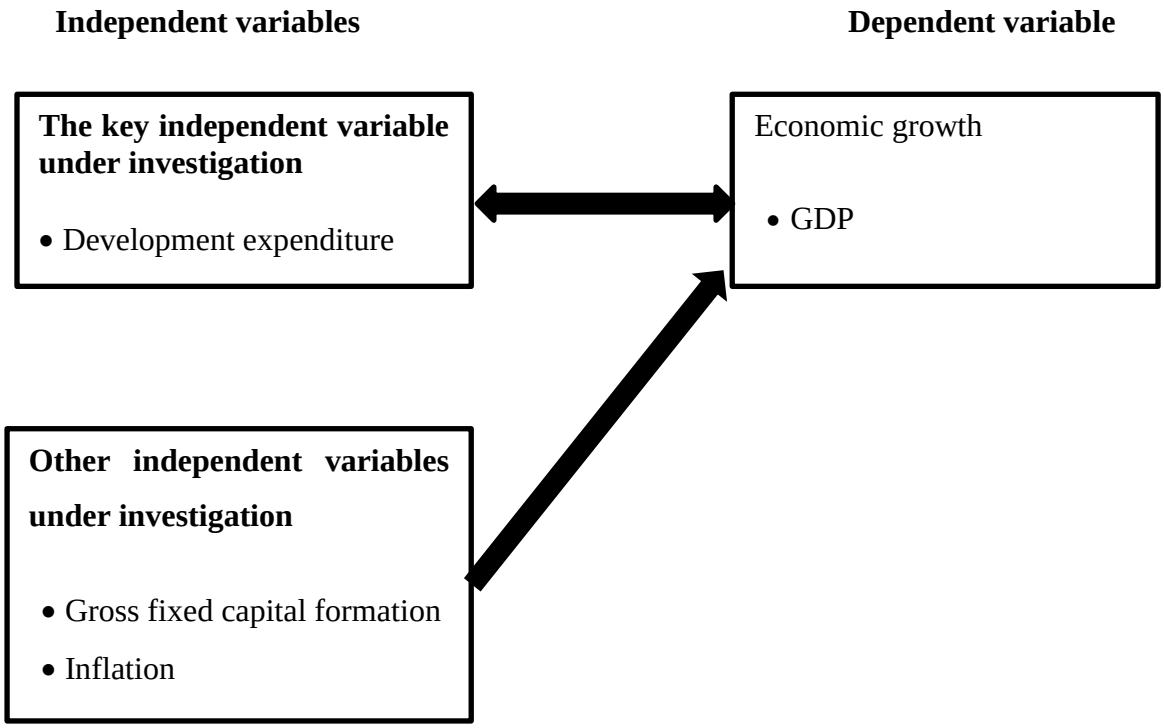

Figure 2. 1: Conceptual framework of the study
Source: Author's conceptualization based on various literature

In the conceptual framework above, the economic growth is measured using GDP in turn dependent on the development expenditures. However, capital expenditure can also affect recurrent expenditure since once the government embarks on any project there is always payment of workers and wages thus leading to recurrent expenditure.

Because it provides data on the size of the economy and how it is operating, GDP has been chosen as a gauge of economic growth (World Bank, 2020). Real GDP growth is frequently used as a gauge of the economy's overall health. The development expenditures include those activities in form of projects which results in the creation of physical assets and in turn are likely to lead to the development of the economy (World Bank, 2018). Hence development expenditure may include among other activities like infrastructural development, health expenditures, educational expenditures, tourism and acquisition of physical assets and stocks.

Apart from the development expenditure, foreign direct investment (FDI), exchange rates, inflation, trade openness and lending interest rate also affect growth. Foreign Direct Investment (FDI) is a type of cross-border investment in which a resident of one economy establishes a long-term stake in and substantial control over a company from another economy. FDI normally have positive impact on economic growth as it creates cash inflow in the country of investment. Exchange rate and trade openness also lead to economic growth.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The methods and procedures, the design of the study as well as methods for gathering, processing, and analyzing data are covered in this chapter. The study primarily makes use of quantitative secondary data from the World Bank website, data from the Ministry of Finance, Planning and Economic Development (MoFPED) and the Bank of Uganda serving as supplement. This chapter also outlines the suggested strategies for addressing the study's specific research objectives.

3.1 Research design

The study adopted a descriptive and explanatory research designs. The descriptive design related to capturing the descriptive features of the tine series data while the explanatory design related to revealing causal connections between the study variables.

3.2 Scope of the study

The study intended to analyze the relationship between government development expenditure and economic growth in Uganda for the period from 2008 Quarter 3 to 2022 Quarter 3. The choice of the study period was because within the specified time range most of the study indicators to address the objectives have data points. The sample size of the time range is also sufficient to facilitate the analysis of time series data.

3.3 Research approach

This study adopted a quantitative research approach. Data on all model variables were numeric and was analysis using statistical and econometric tools.

3.4 Data type and Sources

Time series secondary quarterly data for the period from 2008 Quarter 3 to 2022 Quarter 3 was obtained from Ministry of Finance, Planning and Economic Development and Bank of Uganda. The quarterly data for all the variables of interest was available for this period, hence giving a sample size of 54 observations.

3.5 Choice of the variables included in the empirical model

The choice of the variables to be used in this study was based on the theoretical background on the factors affecting government expenditure visa viz economic growth. The dependent variable is the Gross Domestic Product (GDP) and the independent variable is the development expenditure. The motivation to include development expenditure in the model was because, it is the development expenditures such as road infrastructure, electric power among others that spur the economic growth concurrently. Empirical literature informed identification of other potential growth factors, and these included: exchange rates, inflation, trade, gross fixed capital formation, lending interest rates and external debt service.

3.6 Description of variables included in the empirical models

The variables notations, variable names and their respective units of measurement as well expected signs are shown in Table 3.1.

Table 3. 1: Model variable nations, variable names, units of measurement and the expected signs

Variable Notation	Variable name and units	Expected sign
GDPG	GDP growth (%)	
DEVEXP	Development expenditure (% of GDP)	+
EXRATE	Exchange Rate (LCU per US$)	+
INF	Inflation (annual % change in CPI)	-
TRADE	(Exports+Imports) (% of GDP)	+
LRATE	Lending interest rate (%)	-
GFCF	Gross fixed capital formation (% GDP)	-
DEBTSERV	External debt service (% of exports of goods, services & primary income)	+

Source: Author's compilation

3.7 Model Specification

3.7.1 Vector Autoregressive (VAR) Model to address objective one

To address objective one, the VAR model and the Granger causality Wald test after VAR were used to investigate the direction of causality between government development expenditure

and economic growth (Granger, 1969). The VAR model is a system of equations where all variables are endogenous.

The VAR model can be specified as:

$$GDPG_t = f(DEVEXP_t) \quad (1)$$

$$DEVEXP_t = f(GDP_t) \quad (2)$$

In linear form, equations (1) – (2) can be written as:

$$GDPG_t = \alpha_0 + \sum_{j=1}^{k} \alpha_{1j} GDP_{t-j} + \sum_{j=1}^{k} \alpha_{2j} DEVEXP_{t-j} + \varepsilon_{1t} \quad (3)$$

$$DEVEXP_t = \gamma_0 + \sum_{j=1}^{k} \gamma_{1j} DEVEXP_{t-j} + \sum_{j=1}^{k} \gamma_{2j} GDP_{t-j} + \varepsilon_{2t} \quad (4)$$

Where α_i, γ_i are parameters, j= lags, ε_{it} are error terms;

GDPG= Economic growth

DEVEXP= Development expenditure

3.7.2 Instrumental variable estimation to address objectives two and three

The unit root test indicated that the dependent variable was integrated of order zero, I(0) which suggest unlikely existence of cointegrating relations in the empirical model. Due to potential endogeneity of some regressors, the study adopted a generalized method of moments (GMM) which accounts for endogeneiy of some regressors.

The GMM estimator is formally represented as:

$$y_i = Y_i \beta_1 + X_{1i} \beta_2 + u_i \quad (5)$$

$$Y_i = X_{1i} \pi_1 + X_{2i} \pi_2 + v_i \quad (6);$$

Where: y_i is the dependent variable for the ith observation, Y_i represents the endogenous regressors X_{1i} represents the included exogenous regressors, X_{2i} represents the excluded exogenous regressors. X_{1i} and X_{2i} are jointly called the instruments. u_i and v_i are zero-mean error terms which are assumed to be uncorrelated. The basic principle in the GMM estimation is that there is some moment or orthogonality conditions of the form:

$$E(Z_i u_i) = 0 \quad (7)$$

From equation (1);

$$u_i = y_i - Y_i\beta_1 - X_{1i}\beta_2 \quad (8)$$

If the number of elements in Z_i is just equal to the number of unknown parameters, then we can apply the moment condition in (3) and solve the equation:

$$\frac{1}{N}\sum_i Z_i u_i = \frac{1}{N}\sum_i Z_i(y_i - Y_i\beta_1 - X_{1i}\beta_2) = 0 \quad (9)$$

Equation (9) defines the method of moments estimator. Even if the number of instruments Z_i exceeds the number of parameters to be estimated, the GMM addresses such cases.

In light of the equations (5) - (9) that are required to address endogeneity bias in the empirical model, this study specifies a growth-development expenditure model for estimation as:

$$GDPG_t = \beta_0 + \beta_1\, DEVEXP_t + \beta_2 LogEXRATE_t + \beta_3 INF_t + \beta_4 TRADE_t + \beta_5 LRATE_t + \beta_6 GFCF_t + \beta_7 DEBTSERV_t + \varepsilon_t \quad (10)$$

Where:

$GDPG$ represents Economic growth (% annual growth),

$DEVEXP$ represents Development expenditure (% of GDP)

$LogEXCRATE$ represents the logarithm of exchage rate

INF represents inflation (% change in CPI)

TRADE represents total trade (% of GD)

LRATE represents lending rate (%)

GFCF represents gross fixed capital formation (% of GD)

DEBTSERV represents total debt service (% of exports of goods, services and primary income)

$\beta_0, \beta_2, \ldots, \beta_7$ are model parameters;

ε is the error term.

On the basis of economic theory coupled by empirical evidence, the independent variables of DEVEXP and GFCF in model (10) were considered as endogenous explanatory variables. The first and second lags in DEVEXP and GFCF were used as instruments in the GMM estimation.

3.8 Diagnostic tests

3.8.1 Multicolinearity test

This study testedfor multicollinearity by estimating correlation coefficients between the explanatory variables in the empirical model. Correlation coefficients in excess of ± 0.8 were used an an indicator for high multicollinearity that woul resu in inneficient regression coeffcients.

3.8.2 Unit Root Tests

This study employed two techniques to test for unit root tests in order to determine the order of integration of the time series variables: Phillips-Perron (PP) (Philips & Perron, 1988) in addition to the enhanced Dickey Fuller (ADF) test (Dickey & Fuller, 1979). This is due to the fact that ADF has been shown to have poor power in some situations, while PP immediately modifies the test statistics to account for serial correlation and heteroskedasticity in the errors without the need to specify lag time.

3.8.3 Cointegration test

The unit root test results indicated that the dependent variable was stationary in levels while the independent variables indicated mixed orders of integration. This showed that the dependent variable does not wander over time which nullified the rationale for a cointegration test.

3.5.4 Test for validity of instruments in the GMM model

The study conducted a joint validity of instruments supplied in the GMM estimation using the Hansen's J chi-square test. The null hypothesis tested is that the instruments used in the GMM estimation are jointly valid. This null hypothesis is rejected if the reported p-value is less that the level of significance, 0.05.

3.5.5 Test for endogeneity of the endogenous regressors indicated in the GMM model

This test was conducted to test the endogeneity assumption of the explanatory variables that were indicated as endogenous regressors in the GMM estimation. The null hypothesis tested is that the variables are jointly exogenous. The study used the GMM C statistic test to test this hypothesis. This null hypothesis is rejected if the reported p-value is less that the level of significance, 0.05.

CHAPTER FOUR

PRESENTATION, ANALYSIS AND INTERPRETINATION OF THE FINDINGS

4.0 Introduction

This chapter presents the findings arising from analysis of raw data. In this chapter, key descriptive statistics are presented, diagnostic tests and regression estimated are presented. Interpretation and discussion of results are also presented in this chapter

4.1 Descriptive Statistics

Table 4. 1: Descriptive Statistics (variables are in original units of measurement)

	GDPG	DEVEXP	EXRATE	DEBTSERV	GFCF	INF	LRATE	TRADE
Mean	4.050	6.320	3046.674	6.732	3.893	6.517	21.204	13.851
Median	2.851	6.006	3338.102	5.323	3.434	4.404	20.683	12.739
Maximum	82.468	11.495	3879.540	22.211	8.623	23.647	27.579	25.771
Minimum	-30.308	2.327	1899.710	3.044	1.123	1.580	17.000	8.634
Std. Dev.	19.198	2.246	636.299	3.877	1.868	5.418	2.475	3.972
Observations	54	54	54	54	54	54	54	54

Source: *Generated by the author*

The descriptive statistics in Table 4.1 indicate that the average growth rate for the study period period 2008 quarter 3 to 2022 quarter 3 was 4.05 percent while the median, maximum and minimum growth rates were 2.85, 82.47 and -30.31 percent respectively. On average 6.32 percent of GDP was spend by the government on development expenditure. The median, maximum and minimum values were 6.01, 11.5 and 2.32 percent respectively.

The exchange rate was at an average of 3046.67 with a median, maximum and minimum rates of 3338.10, 3879.54 and 1899.71 respectively. The exchange rate was recorded in terms of Ugandan currency (shillings) per one US dollar. The mean inflation rate was 6.52 with median, maximum and minimum rates of 4.40, 23.65 and 1.58 percent respectively.

The GCFC had an average of 3.89 percent, while the median, maximum and minimum values were 3.43, 8.62 and 1.12 percent respectively. Debt service as a percentage of exports on goods and services averaged 6.73 percent against the median, maximum and minimum of 5.32.22.21

and 3.04 percent respectively. The average Lending Interest Rate was 21.20% and Trade averaged 13.85 as a percentage of GDP.

4.2 Pre-estimation Diagnostic tests

4.2.1 Muticollinearity test: the Correlation Coefficients between explanatory variables

The study tested for high linear correlations between the independent variables by running a pairwise correlation matrix between the independent variables in the empirical model. A threshold of the correlation coefficient of ± 0.8 was based on to determine which independent variables would be highly collinear. Table 4.2 gives the summary of the estimated pairwise correlation coefficients.

Table 4. 2: The pairwise correlation coefficients between explanatory variables

Variable	DEVEXP	EXRATE	GFCF	INF	LRATE	TRADE	DEBTSERV
DEVEXP	1.000	0.584	0.968	-0.360	-0.343	-0.108	0.375
EXRATE	0.584	1.000	0.622	-0.502	-0.315	-0.702	0.536
GFCF	0.968	0.621	1.000	-0.420	-0.364	-0.188	0.360
INF	-0.360	-0.502	-0.420	1.000	0.503	0.526	-0.403
LRATE	-0.343	-0.315	-0.364	0.503	1.000	0.282	-0.396
TRADE	-0.108	-0.702	-0.188	0.527	0.282	1.000	-0.472
DEBTSERV	0.375	0.536	0.360	-0.403	-0.396	-0.472	1.000

Source: *Generated by the author*

On the basis of the threshold of the correlation coefficient ± 0.8, the estimated pairwise correlation coefficients between the independent variables in the empirical model summarized in Table 4.2, evidence from this study suggests that none of the pair of the independent variables have a correlation coefficient in excess of ± 0.8. This suggest that there is no threat of severe multicollinearity in the empirical model for estimation and analysis.

4.2.2 Unit Root Tests

The Phillips-Perron (PP) test method was used for unit root tests and the results are presented in the table 4.3 below. In the event that the variable was stationary in levels, no further test was done in first difference. It is only the variables that were nonstationary in levels for which stationarity was tested in first difference.

Table 4. 3: Unit Root Tests on all variables in the final model

	Levels		First Difference		Order of Integration
Variable	t-stat	Prob	t-stat	Prob	
GDPG	-10.19773***	0.0000	-	-	I(0)
DEVEXP	-4.124215***	0.0020	-	-	I(0)
DEBTSERV	-4.170073***	0.0017	-	-	I(0)
LOGEXRATE	-1.544007	0.5038	-6.709545***	0.0000	I(1)
GFCF	-3.331537**	0.0183	-	-	I(0)
INF	-2.470367	0.1284	-4.425694***	0.0008	I(1)
LRATE	-2.135260	0.2321	-6.952546***	0.0000	I(1)
TRADE	-3.589403***	0.0092	-	-	I(0)

Source: *Author's compilation. *** p<0.01; ** p<0.05; * = p<0.1*

The unit root test results, as shown in Table 4.3, indicate that model variable have mixed orders of integration. The unit root test results indicate that while variables: GDPG, DEVEXP, DEBTSERV, GFCF and TRADE are stationary in level, the variables LOGEXRATE, INF and LRATE are stationary in first difference. The unit root test results therefor suggest that variables GDPG, DEVEXP, DEBTSERV, GFCF and TRADE are I(0) while variables LOGEXRATE, INF and LRATE are I(1). Overall, the unit root test results indicate that the model variables are a mix of I (0) and I(1) variables.

4.3 Cointegration test in the empirical model

Cointegration establishes existence of long run equilibrium relationships among variables in a model. It assumes that variables wonder together overtime, suggesting that the concept relates to nonstationary variables. Since the unit root test results indicated that the dependent variable is stationary, i.e. GDP is I(0), it implies that even if the independent variables may be I(I), there is no long run relation between GDPG and any of the independent variables, which implies that there is no rationale for performing a cointegration test.

4.4 Addressing Objective one of the study: Granger Causality of Economic Growth and Development Expenditure

To address objective one of this study which was set to assess the direction of causality between government development expenditure and Uganda's economic growth, this study estimated a VAR model with stationary variables, and then conducted a Granger causality Wald test for each equation in the estimated VAR to assess the direction of causality focusing on GDPG and development expenditure variables. Lag selection in the VAR was based on Akaike's

Information Criteria (AIC). The VAR model results are summarized in Table 4.4 and the Wald test results for causality after VAR are summarized in Table 4.4b.

Table 4. 4:VAR regression estimates

Equation	Variables	Coef.	Std. Err.	p-value
Equation for GDPG				
	First lag of GDPG	1.5677***	0.0938073	0.000
	Second lag of GDPG	-0.7299***	0.0933619	0.000
	First lag of DEVEXP	-0.0005	0.0029772	0.844
	Second lag of DEVEXP	-0.0038	0.0030368	0.200
	Const	1.0931***	0.3610322	0.002
Equation for DEVEXP				
	First lag of DEVEXP	0.1505	0.135103	0.265
	Second lag of DEVEXP	0.2227	0.1378115	0.106
	First lag of GDPG	-0.5693*	0.296963	0.096
	Second lag of GDPG	1.0989**	0.236749	0.034
	Const	0.5967***	0.18359	0.002

Source: Author's compilation from VAR estimation. ***p<0.01; **p<0.05; *p<0.1

Table 4. 5: Granger causality Wald tests results after VAR estimation

Equation	Excluded variable (s)	Prob > chi2
Equation for GDPG	DEVEXP	0.385
	DEVEXP, Constant	0.385
Equation for DEVEXP	GDPG	0.034
	GDPG, Constant	0.034

Source: *Author's compilation from Granger causality test*

The VAR estimates in Table 4.4 indicate that in the equation for GDPG, the estimated coefficients for the first and the second lags of DEVEXP are statistically insignificant at 5 percent level. This suggests that the lags of DEVEXP do not help to improve on the explanatory power of the GDPG auto regression. On the other hand, the VAR estimates in Table 4.4 indicate that in the equation for DEVEXP, the estimated coefficient for the first lag of GDPG is statistically insignificant at 5 percent level but the estimated coefficient for the second lag of GDPG is statistically significant at 5 percent level. This suggests that the second lag of GDPG when included in the auto regression of DEVEXP could help to improve on the explanatory

power of the auto regression, which could exert granger causality effect. The direction of causality is affirmed by performing the Granger causality Wald test.

According to the Granger causality Wald test results summarized in Table 4.5, the Wald chi-square statistic does not reject the null hypothesis that DEVEXP does not granger cause GDPG at 5 percent level of significance, which suggests DEVEXP does not granger cause GDPG. However, the Granger causality Wald test results reject the null hypothesis that GDPG does not granger cause DEVEXP which suggests that GDPG granger causes DEVEXP. The conclusion is that there is a uni-directional causality from economic growth to development expenditure. Such a direction of causality result could be explained from the fact that high levels of economic growth enable the country to mobilize more resources for financing development expenditure. These results may be accounted for by the so-called "white-elephant" hypothesis in developing countries in which public investment is often used for unproductive projects (Prichett, 1996). However, according to Hong et al., (2020), government expenditure may negatively influence long-run economic growth when financed by tax revenues, but positively influences long-run economic growth when financed by other sources such as non-tax revenues and budget surplus/deficit.

4.5 Addressing Objectives two and three of the study: The GMM regression estimates

Objective two of this study aimed at investigating the effect of government development expenditure on Uganda's economic growth and objective three of this study aimed at investigating other determinants of Uganda's economic growth. These two objectives were assessed by estimating a multivariate regression model by the method of generalized method of moments (GMM). The GMM estimator was preferred because it addresses endogeneity bias arising from presence of endogenous regressors in a regression model. In the empirical model to address objectives one and two of this study, the variable DEVEXP and GFCF were considered as endogenously determined explanatory variables. Table 4.6 show a summary of the GMM estimates.

Table 4. 6: Regression estimates from GMM estimation

Dependent variable: growth rate in GDP (GDPG, %)			
Independent variables	**Coef.**	**Std. Err.**	**p-value**
DEVEXP (% of GDP)	0.0206	0.023272	0.377
LOGEXRATE	-0.7510*	0.435642	0.085
INF (% change in CPI)	-0.2616*	0.127632	0.084
TRADE (E+M, % of GDP)	0.0039	0.128655	0.976
GFCF (% of GDP)	0.0565**	0.018936	0.028
DEBTSERV(% of export of goods &services)	-0.0813**	0.024642	0.045
LRATE (%)	0.06040*	0.039852	0.096
Const	0.6803***	0.094866	0.000

Instrumented variables: DEVEXP, GFCF

Instruments: L. DEVEXP, L2. DEVEXP, L. GFCF L2. GFCF

Robustness tests:

- R-square: $R^2 = 0.554$
- Validity of instruments

  Ho: Instruments are jointly valid

  Hansen's J chi-sq. = 5.45148 (p = 0.2440)

- Endogeneity of the instrumented regressors

  Ho: DEVEXP & GFCF are exogenous

  GMM C statistic chi-sq.= 4.562 (p = 0.047)

The diagnostic test results after GMM estimation, as indicated in Table 4.6, indicate that the fitted GMM regression explains up to approximately 55 percent of the observed data. This is a moderate explanatory power of the estimated GMM regression. The Hansen's J chi-square statistic does not reject the null hypothesis of joint validity of the instruments used in the GMM estimation which suggests that the instruments jointly were valid. The GMM C chi-square statistic rejects the null hypothesis that DEVEXP and GFCF are jointly exogenous which

suggest that these two variables were indeed endogenous regressors. These test results justify the use of an instrumental variables estimation procedure which validates the GMM estimation.

The effect of government development expenditure on Uganda's economic growth: The GMM regression estimates, summarized in Table 4.6, show that the coefficient of Development Expenditure, though positive, is statistically insignificant at 5 percent level of significance (Coef.= 0.0206, p=0.377) . The implication is that development expenditure has no significant effect on economic growth in Uganda. We find that the sign on the estimated coefficient of development expenditure is theoretically plausible though its statistical insignificancy is unexpected. Consequently, estimates partially reject the second hypothesis of this study "Government development expenditure has a positive and significant impact on Uganda's economic growth" in a sense that the reported sign on the coefficient of development expenditure is consistent with the hypothesis but the significance of the estimated coefficient is inconsistent with the hypothesis.

Other determinants of Uganda's economic growth: The GMM estimates summarized in Table 4.6, indicate that the Gross fixed capital formation has a positive and statistically significant coefficient at 5 percent level of significance (coef. = 0.0565, p = 0.028). The GMM estimates also indicate that Debt service has a negative and statistically significant coefficient at 5 percent level of significance (coef. = -0.0813, p = 0.045). The rest of the independent variables such as inflation, trade, logarithm of exchange rate and lending rate have coefficients that are statistically insignificant at 5 percent level of significance.

In conclusion, the GMM regression estimates indicate that development expenditure has no significant effect on Uganda's economic growth. However, the GMM estimates indicate that gross fixed capital formation and debt service are important predictors of Uganda's economic growth. Estimates further reveal that variables such as inflation, trade, lending rate and exchange rate are immaterial in influencing Uganda's rate of economic growth.

4.6 Discussion of the results

In reference to objective one of this study and its related hypothesis, the estimates showed that the development expenditure variable had a positive but insignificant coefficient, a results that was partially in line with the a priori expectation. Development expenditure is supposedly meant for public sector investment that is expected to lead to economic growth. These results

may be accounted for by the so-called "white-elephant" hypothesis in developing countries in which public investment is often used for unproductive projects (Prichett, 1996).

For the other determinate of Uganda's economic growth, findings showed that gross fixed capital formation has a significant positive influence on Uganda's economic growth**.** This result is consistent with theory, as gross fixed capital formation (formerly gross domestic investment) is an important input in the production of goods and services in terms of provision of both physical and money capital as well as financing lucrative projects. This study's findings are in agreement with the conclusion by Ali (2015) who established a positive impact of gross fixed capital formation on economic growth in Pakistan. This is justified by the fact that it allows the creation of enormous benefits, increased investments through the enlargement of markets and economies of scale by transfer of the technology facilities relative to trade which all turn to contribute to foreign exchange used to develop other lagging sectors of the economy. Similar results were also established in lower middle income economies where gross fixed capital formation possessed a positive and significant effect on economic growth (Oli, 2024).

Findings from this study indicated that debt service has a negative and significant effect on Uganda's economic growth. This result is both theoretically plausible and empirically valid. Debt service represents an outflow of government's resources which would otherwise be used for domestic investments that would create more wealth to the nation**.** Cutting on resources allocated to debt service allows a nation to increase on domestic savings that could be ploughed in lucrative investment projects to produce more goods and services.

Other findings from this study revealed that Trade had a positive and statistically insignificant effect on economic growth in Uganda. From theory, trade openness captures the effects of trade policy under the structural adjustment reforms which were expected to lead to high economic growth. The insignificant effect puzzle may be explained by the fact that Uganda continues to export primary products which are subject to adverse terms of trade, while importing manufactured products hence negative effect on economic growth. The exchange rate variable had a negative but statistically insignificant impact on economic growth in Uganda, which result is consistent with some other researchers such as Edwards (1986), Sghaier (2023) and Rhodd (1993) who observed negative short-run effects. In Libya, foreign trade was also found to have a positive and significant effect on economic growth through the fact that it facilitates the exploitation of oil resources to revitalize industry and agriculture production so as to boost exports of goods which reflects economic growth than exportation of

crude oil (Farag et al., 2021). The inflation variable had a negative and insignificant effect on Uganda's economic growth. The results of the negative relationship between inflation and economic growth is consistent with theory. The statistical insignificance could be explained from the fact that Uganda has had moderate rate of inflation over the sample period considered in this study. The strong and sound fiscal and monetary stance Uganda government has undertaken over the study period could explain why inflation has not escalated to significantly impact of rate of Uganda's economic growth.

CHAPTER FIVE

SUMMARY, CONCLUSION AND POLICY RECOMMENDATIONS

5.0 Introduction

This chapter gives a summary of the study in terms of what the study had set out to investigate, key findings and policy recommendations.

5.1 Summary of Study Findings

Using the Vector Autoregressive (VAR) model and GMM estimator on quarterly data for the period 2008 quarter 3 to 2022 quarter 3, the study examined the direction of causality as well as the causal relationship between development expenditure and economic growth. The study also investigates other key determinants of Uganda's economic growth. The data was sourced from Ministry of Finance, Planning and Economic Development and Bank of Uganda.

The VAR model findings suggest that there is a uni-directional causality running from economic growth to development expenditure, but no significant causality from development expenditure to economic growth. The GMM model estimate suggest that development expenditure has a positive but statistically insignificant effect on economic growth. The GMM estimates also unveiled that gross fixed capital formation and debt service were important predictors of Uganda's rate of economic growth. Practically, estimates indicated that Uganda's rate of economic growth could be enhanced by increase in gross fixed capital formation and a decrease in debt service. Estimates further revealed that variables such as exchange rate, inflation, trade and lending rate are unimportant factors influencing Uganda's rate of economic growth.

5.2 Conclusion of the study

The VAR estimation and the subsequent granger causality test results revealed that causality was running from economic growth to development expenditure and not from development expenditure to economic growth. Possibly because of this kind of directional causality result, regression estimates showed that variations in development expenditure had no significant effect on Uganda's rate of economic growth. The variables of gross fixed capital formation and debt service were significant factors influencing Uganda's rate of economic growth.

5.3 Policy Recommendation

Basing on the findings from this study, the following recommendations are derived:

(i) To have a positive and significant effect of development expenditure on the economic growth process in Uganda, government should scrutinize and prioritize public investment projects financed by development expenditure to avoid the "white-elephant" hypothesis.

(ii) The government should enhance investment projects to boost the fixed capital formation which can attract more investors and even expand trade activities due to lower cost of doing business.

(iii) The government should consider strategies to raise more domestic revenue in order to cut off debt acquisition and the associated debt servicing. Raising more of the domestic revenues some way of avoiding unprecedented external and domestic debts, thereby cutting on debt servicing, and reserving government resources that could be used for domestic investments that enhance economic growth.

5.4 Areas for further studies

The study was restricted to a study period to the period 2008 quarter 3 to 2022 quarter 3 for which quarterly data was available for all the variables of interest. With this time span, diagnostic tests revealed analysis could not accommodate cointegrattion regression techniques. Upon this backdrop, future studies on the same or related topic could be done on a larger sample that could allow cointegrtation regression techniques that enable analysis of both short run and long run causal relationships.

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