FISCAL POLICY, INFLATION AND OUTPUT GROWTH IN KENYA: AN ASYMMETRIC APPROACH

JUDY JEMUTAI

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF ECONOMICS OF THE UNIVERSITY OF EMBU

JUNE, 2025

DECLARATION

This thesis is my original work and has not been presented for a degree or in any other award.

Signature…… Date…….

Judy Jemutai

Department of Economics

D531/1508/2021

This thesis has been submitted for examination with our approval as the University Supervisors

Signature…… Date…….

Dr. Moses Mutharime Mwito

Department of Economics

University of Embu

Signature…… Date…….

Dr. Paul Mugambi Joshua

Department of Economics

University of Embu

DEDICATION

In loving memory of my dear uncle, Haron Kiprono Kutto, whose wisdom and kindness continue to inspire me every day.

ACKNOWLEDGEMENT

I would like to sincerely thank the Almighty God for His Grace. He gave me knowledge that enabled me to carry out this study, as well as giving me life and good health, to Him be the glory and honor. Secondly, I would like to acknowledge the role played by my lecturers in the Department of Economics, in particular my supervisors, Dr. Moses Mutharime Mwito and Dr. Paul Mugambi. Their constructive criticisms, suggestions, encouragements and support, comments and advice guided me through the process of writing and completion of this thesis. I appreciate the time they dedicated to reviewing my work. A note of acknowledgement goes to the University of Embu for awarding me the scholarship to pursue Master of Economics as well as providing a conducive environment for learning. I am also humbled by the support given to me by my parents, especially my mother for taking care of my daughter while I was in school for the entire course. Lastly, I am sincerely thankful to my friends and colleagues for their moral support and their presence when I needed them.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS AND ACRONYMS

ADF	Augmented Dickey-Fuller
AIC	Akaike's Information Criteria
AMECO	Annual Macro-Economic Database.
ARDL	Autoregressive Distributed Lag
COVID-19	Corona Virus Disease 2019
CPI	Consumer Price Index
FTPL	Fiscal Theory of Price Level
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
KNBS	Kenya National Bureau of Statistics
NARDL	Non-linear Autoregressive Distributed Lag
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares
PMG	Pooled Mean Group
R & D	Research and Development
SSA	Sub-Saharan Africa
SVAR	Structural Vector Autoregression
USA	United States of America
VAR	Vector Autoregressive
VECM	Vector Error Correction Model

DEFINITION OF TERMS

Asymmetry	Refers to a lack of balance or equality between two or more related things
Fiscal Policy	Refers to the use of government spending and taxation to influence the economy. It usually influences macroeconomic conditions
Inflation	This is the general rise in the level of prices of goods and services in an economy over some time.
Output Growth	This is a measure of the increase in the total output of goods and services produced in an economy over time.
Tax Revenue	Refers to the income that a government collects from individuals, businesses, and other entities through various forms of taxation
Public Debt	The total amount of money a government owes to its creditors, primarily due to borrowing to finance government spending.
Government Spending	Is the amount of resources spent by a particular government to finance all its operations so as to provide public goods.

ABSTRACT

Fiscal policy is one of the tools employed by the Kenyan government to enhance economic performance towards realization of the Kenya Vision 2030 as the blueprint for economic, social and political development. However, the gross domestic product in Kenya has been below the targeted 10% as inflation rates fluctuate above the 5% target. Therefore, the study investigated the effect of fiscal policy on inflation and output growth in Kenya using an asymmetric approach for the period between 1991 and 2021. The study differs from previous studies by applying the non-linear autoregressive distributed lag modelling to capture asymmetric dynamics. The study identified a long-run equilibrium and cointegrating relationship among the study variables, with the findings revealing the existence of a long-run asymmetric effects of public debt and government spending on inflation as well as asymmetric effect of government spending on output growth. A positive relationship between previous increases in public debt and current inflation in the short-run was also established, while decreases in public debt was found to increase inflation in both the long-run and short-run. Similarly, positive changes in government spending raise inflation. Decreases in tax revenue was found to have a negative effect on inflation in the long-run. On the other hand, the short-run results indicate that reductions in tax revenue have positive effect on output growth, whereas increases in tax revenue reduce output growth in the long-run. Additionally, increases in public debt have negative short-run effect on output growth. The findings also indicated the existence of a persistent negative effect of decreases in government spending on output growth into the long-run. Positive changes in government spending result to an increase in output growth in the long-run. As such, the study recommend that the government should direct its expenditures toward productive sectors such as infrastructure development to reduce the cost of doing business and enhance efficiency in service delivery to accelerate growth and development. The study also suggests on proper management of public debt by ensuring that any additional expenditures contribute positively to the overall growth by ensuring a balance between achieving economic growth while avoiding adverse effects for inflation.

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

Governments use fiscal policy tools such as spending and taxation to influence macroeconomic performance (Kim et al., 2021). As such, governments aim to attain various economic and social objectives that include full employment, exchange rate stability, inflation management, favorable balance of payment, sustainable and fair growth and equitable distribution of income (Aziz & Asadulla, 2017). According to the Keynesian theory, the use of expansionary fiscal policy affects a country's economy through its influence on aggregate demand (Poku et al., 2022). Due to its potential to stabilize the economy, fiscal policy has found relevance across various economic contexts worldwide and is employed to stabilize prices, address market failures, protect vulnerable groups, and to promote income distribution (Benimana, 2020). Fiscal policies are also used as countercyclical measures to smooth out fluctuations of the business cycles (de Haan & Gootjes, 2023).

In the recent times, the global economy has experienced fluctuations in inflation rates and economic growth, that can be attributed to the 2007/2008 global financial crisis and the corona virus pandemic of 2019 (Anyanwu & Salami, 2021; Jałtuszyk, 2022). In response to economic shocks that arise from such events, and in order to ensure macroeconomic stability, fiscal policies have been widely used. For instance, during the global financial crisis, most countries implemented fiscal stimulus packages as a means of supporting economic growth (Ramey, 2009). In the United States of America (USA), European countries and many economies in Asia, countercyclical fiscal policies were adopted. These encompassed tax cuts and increase in government purchases, aimed at mainly boosting short-run and medium-run growth (Jha et al., 2014; Ramey, 2009). Amid the COVID 19 pandemic, fiscal policies were largely implemented to prioritize healthcare services across the world by lowering tax rates on medical items, which served as an emergency lifeline to safeguard the well-being of individuals (Chakraborty & Thomas, 2020). Fiscal policies were also crucial in supporting the social safety nets. However, during the pandemic, most countries such as the USA engaged in large fiscal measures to

stimulate consumer demand but ended up exacerbating inflationary pressures due to the mismatch between the rising demand and the constrained supply chains (de Soyres, 2023). This underlines the fact that fiscal policies need to be adequately managed to avoid unintended inflationary consequences (Asandului et al., 2021)

Attainment of fiscal policy objectives is a complex task that is often impeded by tax collection difficulties and also by challenges that arise when attempting to balance the need to stimulate output growth while at the same time controlling inflation (Georgantopoulos & Tsamis, 2011). However, in most Sub-Saharan Africa countries, tax collection difficulties are significant and have undermined the ability of countries to finance their expenditures. For instance, Kenya has been unable to maintain a sustainable fiscal policy and this has hindered long-term economic stability and development (Mathu et al., 2018). Kenya's government spending has consistently exceeded its revenues, resulting in the need to borrow externally and domestically in order to finance its expenditure targets, thereby leading to a debt burden (Muguro, 2017). Between 1991 and 2002, Kenya's public debt averaged 60.8% of the gross domestic product (GDP), while it averaged 49% of the GDP between 2003 and 2007. Then from 2008, the public debt rose from 34.4% of the GDP to 68.1% in 2021 (Kenya National Bureau of Statistics [KNBS], 2022). As a result, the rise in public debt has made it more difficult to fund essential public services, thereby hindering long-term economic stability and development (Mose et al., 2024).

Kenya's economy has experienced various economic reforms since the 1980s, starting with the implementation of the Structural Adjustment Programmes (SAPs), to the Economic Recovery Strategy between the year 2002 and 2007 and to the formulation and adoption of the Kenya Vision 2030 as the blueprint for economic, social and political development in 2008 (Saungweme & Odhiambo, 2021). Through Kenya Vision 2030, Kenya targets a gross domestic product (GDP) growth rate of 10% and at the same time aims at maintaining the rate of inflation at below 5% (Wanjiku, 2013). However, despite Kenya's inflation rate steadily declining from 26.2% in 2008 to 6.1% in 2021, the 5% inflation target has not yet been achieved. Additionally, the 10% GDP growth rate target is far from being attained as the country's growth rate has been fluctuating between 4.2%

and 5.9% for the period between 2008 and 2019. Noteworthy, the country's GDP growth rate declined to -0.3% in 2020 as it was significantly impacted in 2020 due to the global effects of the corona virus pandemic (Makin & Layton, 2021).

The 7.5% growth in Kenya's GDP in 2021 was due to an 8-point economic stimulus program that was purposely designed to spur economic growth as a post COVID-19 economic recovery strategy (Walakira, 2021). On the other hand, the rise in Kenya's inflation rate from 5.2% in 2019 to 6.1% in 2021 was due to the effects of coronavirus pandemic, which resulted in supply chain disruptions (Walakira, 2021). From a global perspective, in contrast to the 2.7% rise in global inflation rate observed in 2009 due to global financial crisis, the global inflation rose by 8.7% in 2022 due to the effects of corona virus pandemic (Jałtuszyk, 2022).

A significant number of empirical studies have been conducted to determine the degree to which fiscal policy affects inflation and output growth (Nuru & Gereziher, 2022). However, most of these empirical studies have focused on the symmetric effects of fiscal policies on output growth and inflation rates and reported different findings. For example, studies such as Shevchuk and Kopych (2018), Deskar-Skrbic and Simovic (2017) and Franta (2012) establish positive effects of government expenditure on GDP growth rate. On the contrary, studies such as Alesina and Ardagna (2010), Saez (2017) and Barlas (2020) show that government expenditure reduces the GDP growth rate. Other studies such as Kigotho and Odhiambo (2015), Surjaningsih et al. (2012) and Ezirim et al. (2008) found that government spending has a negative effect on inflation, while tax revenue has a positive effect on inflation. However, some others like Alesina and Ardagna (2010), Olayungbo (2013) and Odera and Ouma (2009) found positive effects of government spending on inflation, while tax revenue had no significant impact on inflation.

The most recent studies (Sriyana & Ge, 2019; Asandului et al, 2021; Nuru & Gereziher, 2022; Zeng & Yue, 2022; Tahir et al., 2022) have, however, argued that the treatment of the effects of fiscal policy on output growth and inflation rates could be asymmetric, and the assumption of a symmetric relationship between the variables could be the reason behind the conflicting findings. As such, assuming linearity between economic variables

can obscure the true nature of their relationships, resulting in potentially unreliable findings due to the prevalence of non-linear relationships (Bussiere, 2013).

1.1.1 Fiscal Policies, Inflation and Output Growth in Kenya (1991-2021)

During the period between 1991 and 1995, Kenya's tax revenue grew by 25% while government expenditure rose by 27.3% (Kansiime et al., 2021).This increase in government spending, resulted in a period of high inflation rates that reached 46% in 1993. In 1993 as well, the GDP growth rate was 0.4%, while it decreased to 0.3% in 2000 when inflation reached 9.98% (Maingi, 2010). Moreover, from 2000 and 2007, the government expenditure as a percentage of GDP increased from 9.97% to 14.0%, while tax revenue relative to expenditures rose significantly between 2002 and 2008 (Muguro, 2017). This was due to the implementation of the Economic Recovery Strategy which was meant to enhance the private sector in wealth creation in order to improve the country's economic growth (Mutuku, 2015). As a result, there was a decrease in public debt that averaged 49% between 2003 and 2007. The decrease in public debt was accompanied by a rise in inflation during this period, reaching a peak of 26.24% in 2008 (Maingi, 2017). Figure 1.1 shows the trends in Kenya's output growth and inflation rates.

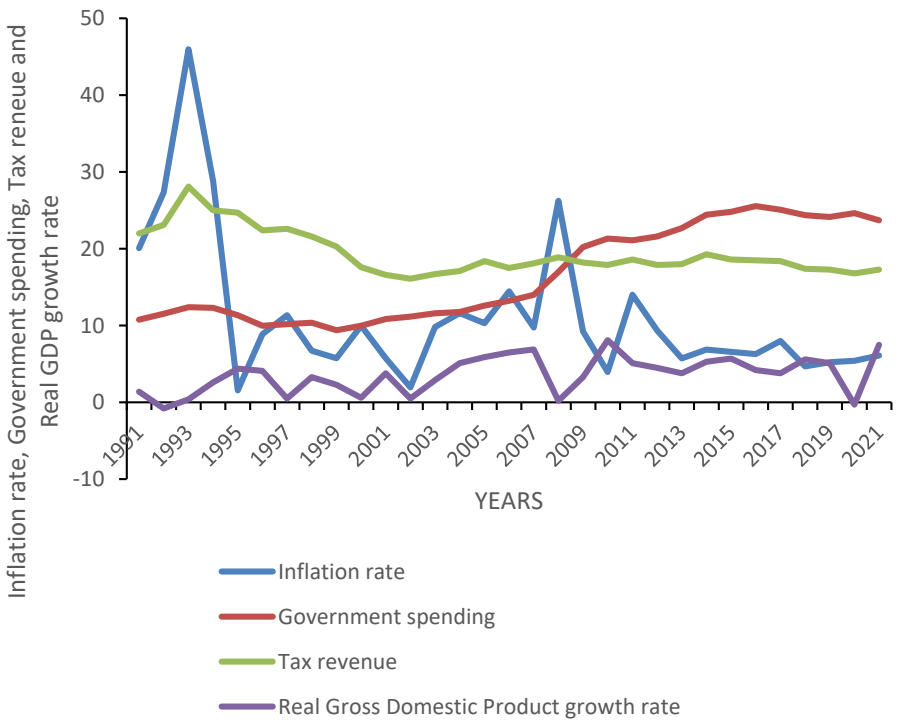

Figure 1.1: Trends in Kenya's Fiscal Policies, Inflation Rates and Real GDP Growth Rates.

Source: Author's Compilation using Data from the World Development Indicators database of the World Bank and from the Kenya National Bureau of Statistics (KNBS).

As shown in Figure 1.1, economic growth decreased to 0.2% in 2008 following the 2007/2008 global financial crisis and Kenya's post-election violence. Subsequently, growth returned to an average of 5% between 2009 and 2013, Inflation rates rose to 14% in 2011 from 3.9% in 2010 (Kairanya, 2016). Between 2008 and 2012, there was an overall increase in Kenya's public debt due to a 4.6% increase in government expenditure, compared to a 0.2% decrease in tax revenue (as a percentage of GDP) (Muguro, 2017).

From 2013 to 2015, the government's expenditure outpaced the growth in tax revenue by 1.7%, largely due to the introduction of devolution and the allocation of funds to new infrastructural projects. During the same period, the government implemented a number of tax reforms including, restructuring of VAT, reduction in personal income tax and corporate tax. However, both government expenditure and tax revenue have since declined, with government expenditure reaching 24.6% in 2020 as tax revenue reached

16.8%. Following subdued revenue growth and an expansive budget, the government has been forced to widen the budget deficit and borrow more to meet its budgetary needs, resulting in public debt becoming a key source of budget financing in Kenya, consequently causing a rise in public debt to 68.1% in 2021, with inflation reaching 6.1% (Kiriga et al., 2020). These rising public debt has been further compounded by the economic impacts of the corona virus pandemic in 2020, the " Big Four" agenda and the implementation of the Kenya Vision 2030 (Kansiime et al., 2021).

1.2 Statement of the Problem

Through fiscal policies, a government can influence the level of economic growth and inflation rates. In Kenya, fiscal policy is instrumental in boosting economic performance towards realization of the Kenya Vision 2030. However, contrary to Keynesian theory on the use of fiscal policy to promote economic growth and stability, Kenya's economic growth rates have been unstable and subject to fluctuations, often falling far below the 10% target with inflation growing above the 5% target. This could be as a result of insufficient or ineffective government policies in responding to changing economic conditions, or because the government is not quick in recognizing and reacting to such changes (Chen et al., 2020).

Economists and policymakers have shown significant interest in the relationship between fiscal policy, inflation and economic growth, as they attempt to understand how fiscal policy variables influence inflation and economic growth. Accordingly, most empirical studies have focused on symmetric effects with few studies appearing to examine the phenomena of asymmetry. However, the few existing studies on asymmetry have largely been centered around developed nations (See Choi & Devereux, 2006; Hallerberg et al., 2007; Afonso & Sousa, 2012; Tsuchiya, 2016; Zeyneloglu & Koenig, 2017; Asandului et al., 2021; Zeng & Yue, 2022; Tahir et al., 2022), while developing countries such as Kenya have limited literature on asymmetric effects of fiscal policy on inflation and output growth rates. Therefore, due to the significance of fiscal policies coupled with conflicting empirical findings, there is need for further empirical investigation. Therefore, this study aims to analyze the asymmetric effects of fiscal policy on inflation and output growth rates

in Kenya, in order to introduce non-linear adjustments into the analysis process. This helps to determine whether the short-run and long-run effects of fiscal policy are asymmetric.

1.3 Research Objectives

This study was guided by both the general and specific objectives.

1.3.1 General Objective

The general objective of this study was to examine the asymmetric effects of fiscal policy on inflation and output growth in Kenya.

1.3.2 Specific Objectives

i. To determine the asymmetric effects of tax revenue on inflation and output growth in Kenya
ii. To assess the asymmetric effects of government spending on inflation and output growth in Kenya
iii. To evaluate the asymmetric effects of public debt on inflation and output growth in Kenya

1.4 Research Hypotheses

$H_{01:}$ Tax revenue has no significant asymmetric effect on inflation and output growth in Kenya

$H_{02:}$ Government spending has no significant asymmetric effect on inflation and output growth in Kenya

$H_{03:}$ Public debt has no significant asymmetric effect on inflation and output growth in Kenya

1.5 Significance of the Study

Kenya's government has been unable to maintain a sustainable fiscal policy due to an imbalance between government expenditures and revenues. In recent years, government spending has consistently exceeded its revenues, resulting in the need to borrow in order to finance its fiscal targets, creating a burden of debt accumulation. This has made it more difficult to finance essential public services and hindered the achievement of the medium term plan's (MTPs) targets for the realization of the Kenya's Vision 2030. Therefore, by

examining the trends, patterns, and effects of fiscal policy variables, this study aims at providing a better understanding of Kenya's economic performance, this helps to inform the policymakers on decision making and careful approach to the fiscal policy strategies. Additionally, unlike the previous studies, the study applied the non-linear autoregressive distributed lag (NARDL) modelling whose approach to error correction and cointegration introduces non-linear adjustment into the analysis process. It also helps to determine whether the short-run and long-run effects of fiscal policy on inflation and output growth rates are symmetric or asymmetric.

1.6 Scope of the Study

The study covered a period of 31 years starting from 1991 to 2021. This period covers the era of implementation of economic reforms in Kenya, including the continued implementation of Structural Adjustment Programs in the 1990s and Economic Recovery Strategy in the early 2000s. The period also covers significant events such as the 2007/2008 global financial crisis and the covid-19 pandemic of 2019. Additionally, despite the government's efforts to increase the level of tax revenue, the government expenditures have outgrown tax generation leading to growth in public debts. With a noticeable increase in debt accumulation during the launch of the Kenya Vision 2030, the "Big Four" agenda and the effects of the COVID-19 pandemic that affected the world economies due to fiscal stimulus that was implemented by most countries. As a result, this period allows for a proper analysis of how Kenya's fiscal policy has affected inflation and output growth.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section reviews theories that guide macroeconomic policies, economic growth and inflation. It also critically reviews empirical studies that are related to the study topic.

2.2 Theoretical Literature Review

This part offers an overview of theories that are relevant to the study by critically looking at the existing theories that are significant to the study. This study was anchored on four theories including, Classical theory, Keynesian Theory, Endogenous Growth, New Keynesian Theory and the Demand-pull Inflation Theory.

2.2.1 Classical Theory of Economics

According to Classical economists, the economy is best when left on self-correcting mode as they believed that, supply of goods and service creates its own demand and that the government should avoid intervening in economic decisions (Korkmaz & Guvenoglu, 2021). According to the Classical theory, the government should only intervene in the economy if it is absolutely necessary to do so. This means that, when correcting market failures, such as monopolies and externalities, or to provide public goods (Jackson & Jabbie, 2020). In addition, since the government should not interfere in the market, fiscal policy should be used sparingly and only when necessary.

Unlike Keynesians, Classical theory contends that government expenditure is not an efficient tool for economic growth as they believe that too much spending crowds out private investments (Korkmaz & Guvenoglu, 2021). This is as a result of the government running a budget deficit which tends to force the government into borrowing and hence increased interest rates due to resource constraint making borrowing more expensive for individuals and businesses (Yusuf & Mohd, 2021). Classical theory is relevant to the study as classical economists suggested that, fiscal policy should only be employed cautiously and when absolutely necessary. This implies that, fiscal policy should be used to correct

market failures and provide public goods. In addition, the government should carefully consider the potential impacts of its policies before implementing them.

2.2.2 Keynesian Theory

The Keynesian theory is based on the book titled “The General Theory of Employment, Interest and Money” that was published by Keynes (1936). Keynesian macroeconomic theory suggests that, the government should employ fiscal policy for the achievement of desired economic objectives due to its ability to intervene in the economy and control the market, which is not always able to achieve full employment by itself in the short-run (Ramey, 2011). Keynesian economists believe that through the Keynesian multiplier effect on aggregate demand, increased spending and lower taxes will likely result in lower unemployment rates, higher private sector profitability and higher investments levels thereby contributing positively to economic growth (Ojong, 2016).

Keynes (1936) however, indicated that too much debt financing could crowd out private investment (Benin & Odjo, 2018). This occurs as a result of increase in interest rates which causes a decrease in the amount of money available for private investment. This decrease in private investment reduces the amount of economic activity in the economy, which in turn results in a decrease in output growth. This theory has found relevance across various economic contexts and has been widely implemented due to its effectiveness through the use of fiscal policy in stimulating economic growth (Yusuf & Mohd, 2021). However, the Keynesian theory ignores inflationary pressures which may occur as a result of increase in government spending (Edward & Hillyer, 2017).

2.2.3 Endogenous Growth Theory

The theory was introduced by Romer and Lucas (1990). This theory suggests that, endogenous technological progress contributes significantly to the growth of the economic. The model posits that investment in physical capital and research and development (R&D) drives technological advancement while the rate of technological progress determines economic growth (Gruzina et al., 2021). Endogenous growth theory assumes constant rather than diminishing returns to scale by showing how long term growth may go on since the returns on investment including human capital does not necessarily diminish as economies develop (Rebello, 1991; Romer, 1986). Fiscal policy can have a positive effect on output growth in the AK endogenous growth model by increasing physical capital and R&D. Increased physical capital and R&D investments can lead to an increase in the productivity of labor and capital, which in turn can lead to higher output growth while at the same time having a negative effect on inflation. This is because when the government increases its budget, taxes are typically increased as well, which reduces the amount of disposable income that people have and reduces the amount of money in circulation (Yusuf & Mohd, 2021).

The Endogenous Growth Model is relevant to this study due to its influence on economic performance through facilitating innovation, enabling market forces and correcting market failures. This would ensure growth in investment in physical capital, human capital and research and development to drive technological progress and increased productivity.

2.2.4 New Keynesian Theory

The New Keynesian theory was developed in the 1980s as a response to the challenges posed by New Classical economics (Gordon, 1990). The key contributors of the New Keynesian Economics are Alan S. Blinder, N. Gregory Mankiw, John Taylor and David Romer. New Keynesian Theory is based upon the Keynesian system which considers that when the economy is left to itself it will settle at less-than full-equilibrium in the short-run (Hic, 2019).

The New Keynesian Economics provide the consistency between the micro and macro-analysis. It aims to explain the short-run economic fluctuations focusing on how prices and wages adjust and why markets do not always clear efficiently. The New Keynesian model sees the economy as returning to full employment once prices can reset so that fiscal policy is only temporarily effective and only if it is conditioned on unexpected demand shocks (Palley, 2013). Therefore, since the prices are sticky in the New Keynesian model, price setting must take into account future prices and an important issue in estimation is how to deal with expectations about future prices. The New Keynesian theory posits that, inflation depends on expected inflation in the next period and the output gap (Roberts, 1995).

$$\pi_t = \beta E_t[\pi_{t+1}] + \alpha Y_t + \varepsilon_t \quad (2.1)$$

Where π_t is the current inflation rate at time t, β is the discount factor, $E_t[\pi_{t+1}]$ is the expected inflation in the next period. Y_t is the output gap (difference between actual and potential output) which is the measure of economic growth based on the Hodrick-Prescott (HP) filtered real GDP, while α is the sensitivity of inflation to the output gap.

The New Keynesian framework shows the importance of managing expectations through credible monetary policy while addressing structural challenges that influence the output gap. Price stickiness and external factors may lead to deviations from the expected inflation-output relationship, necessitating customized policy measures. It provides a contemporary approach to understanding and managing inflation by emphasizing on wage and price stickiness, rational expectations, the output gap, and the central bank's credibility (Springler, 2019). The theory also illustrates how fiscal policy impacts output and inflation through mechanisms like delayed price adjustments and market imperfections which allows government intervention through government spending or taxation to influence demand.

2.2.5 Demand-Pull Inflation Theory

According to Keynes' demand-pull theory of inflation, rising government spending or tax reductions could influence the rate of inflation. If these policies stimulate aggregate demand in an economy, they can have a demand-pull effect on inflation. Consequently,

prices rise as consumers compete for limited goods and services, resulting in inflationary pressures (Udoh & Kokoette, 2023). Every time the value of quantity supplied exceeds the value of quantity demanded, an inflationary gap arises at full employment (Totonchi, 2011). According to Hiller (1997), when the GDP increases that is, when the country's economy expands, unemployment declines and consumers become more inclined to make larger purchases. Prices will rise because the economy would have more money but fewer goods and services. This theory is relevant to the study as the country has been experiencing high rates of inflation which has been mainly driven by increased government expenditures to meet the public services. Therefore, there has been greater demand for goods and services than what is available in supply. By studying Demand-pull inflation, it helps the policymakers to implement measures to minimize the adverse effects and promote price stability.

2.3 Empirical Literature Review

2.3.1 Tax Revenue, Inflation and Output Growth Rate

Furceri and Karras (2009) analyzed tax revenue-economic growth nexus between 1965 and 2007 across twenty-six economies using fixed and random effects models. The results showed a long-run and negative effect of tax revenue on real GDP. This revealed that in the long-run, a 1% increase in tax revenue as percentage of GDP, reduces GDP per capita by -0.5% to -1%. However, the study left out government expenditure and public debt variables of the fiscal policy and inflation. In addition to failing to account for non-linear relationships between tax revenue and GDP, the fixed and random effects models that were employed also fails to capture changes in the relationship among the study variables over time. Furthermore, it is difficult to draw clear conclusions when comparing vastly different economies, as different countries have different levels of development.

Similarly, Ahmad et al. (2018) used an ARDL model to examine the effects of tax revenue on economic growth in Pakistan between 1974 and 2010. The findings of the ARDL model indicated that, economic growth is negatively influenced by tax revenue. Specifically, they found that an increase of 1% in total tax revenue reduces economic growth by 1.25%. However, the study used ARDL model which only examines short-run

and long-run effects but does not introduce non-linear adjustments into the analysis process as in the NARDL modelling.

On the contrary, Ali et al. (2018) used secondary data between 1980 and 2007 to examine the effects of tax revenue on Kenya's economic growth. The findings of the Ordinary Least Squares (OLS) model indicated a positive relationship between income generation and economic growth. The analysis excluded other variables including, government spending and public debt and their effects on output and inflation. Secondly, the study employed OLS models that does not capture the non-linear relationships between variables and susceptible to over-fitting leading to inaccurate results. Similarly, Oboh et al. (2018) investigated tax revenue and economic growth in five selected Communities of West African States using data from 2000-2015. From the Seemingly Unrelated Regression Estimate (SURE) analysis technique that was employed by the study, the results pointed to a positive relationship between tax revenue and economic growth in the selected communities.

Atan and Effiong (2021) examined the effects of fiscal policy on inflation in Nigeria, focusing on the critical limit hypothesis. The findings revealed that, increases in government expenditure were not inflationary but insignificant. Consequently, they suggest increasing government expenditure as the critical limit has not been reached. In contrast, Udoh and Kokoette (2023) established that increases in recurrent expenditure positively influences inflation, whereas increases in government's capital investment leads to a reduction in inflation. The study investigated fiscal policy and inflation in Nigeria from 1986 to 2021, employing the ARDL methodology. Their results also revealed that, increases in tax revenue leads to long-run reduction in inflation, whereas tax revenue reductions result in long-run increases in inflation. The study recommended implementing a carefully planned fiscal strategy to effectively manage inflationary pressures in Nigeria.

Obaretin and Akhor (2019) examined the role of taxation as a tool for addressing the challenges of inflation in Nigeria for a period of over a twenty-year span (1994–2014). The analysis was conducted using the Error Correction Model (ECM). The study found that all examined tax variables company income tax, value-added tax, and customs and

excise duties had a positive but statistically insignificant relationship with inflation. Based on these findings, the study recommended that the government and policymakers develop a more proactive tax policy to address inflation. Additionally, the study suggested on reviewing periods of low inflation in Nigeria to assess whether indirect taxes contributed to the decline and, if so, to consider implementing similar tax strategies in the future.

Tsaurai (2021) examined the effects of tax revenue on economic growth in emerging market economies for the years 2008 to 2018. The study utilized the Generalized Method of Moments (GMM) and Random effects analysis techniques. The findings from the GMM regression model indicated a significant relationship between tax revenue and economic growth. As such, the study recommended that governments should ensure a careful tax revenue generating policies to enjoy sustainable long-term economic growth. A similar study was conducted by Alinaghi and Reed (2021) on the effects of tax revenue on economic growth in OECD countries and found that positive changes in tax revenue increases the annual GDP growth of these countries.

Attah et al. (2022) investigated the impact of tax revenue on economic growth in the Sub-Saharan Africa (SSA) region. Based on the Fixed Effect Model and data for twelve regional countries between 2005- and 2020, the study concluded that taxes negatively affect economic growth of the SSA countries. To reduce the deadweight loss brought about by increase in taxation, the study recommended the governments of SSA countries to implement tax cuts. Nguyen and Darsono (2022) carried out a study in Southeast Asian countries on the effects of investment and tax revenue on economic growth from 2000-2020 and presented comparable findings. Using both the random and fixed effect estimation techniques, the study findings indicated negative effects of tax revenue on economic growth. As such, the study suggested that government actions such as taxation are crucial in controlling economic growth of a country.

2.3.2 Government Spending, Inflation and Output Growth Rate

Surjaningsih et al. (2012) investigated inflation and output growth in Indonesia between 1990 and 2009. From the vector error correction model (VECM) estimation technique, the study found that government spending could be an effective means of stimulating economic growth during recessions, while also helping to reduce inflation. However, the

VECM technique that was used can suffer from multi-colinearity, and does not capture the effects that are as a result of the presence of endogenous variables, this model can also be sensitive to outliers.

Olayungbo (2013) examined the asymmetric effects of government spending on inflation in Nigeria from 1970 to 2010. According to the findings, Nigeria's inflationary pressure depends on the state, meaning that low government spending leads to high inflation. However, the analysis did not capture other aspects of fiscal policy, such as borrowing and taxation. Secondly, Vector Autoregressive (VAR) models can be challenging to interpret, not suitable for causal inference and does not account for non-linear relationship among the study variables.

Ezirim et al. (2008) examined the relationship between the growth rate of public spending and the inflation rate for the United States of America (USA) from 1970 to 2002 using the Granger-causality approach and co-integration. They study discovered a positive correlation between the two factors. There was also a bi-causal relationship between inflation and the growth of public spending. In the United States of America, decisions about public spending are heavily influenced by inflation. It was observed that rising public spending increases the nation's inflationary pressures, whereas falling public spending tends to lower inflation.

Castro and Cos (2008) assessed the effect of fiscal policy shocks in Spain since the mid-90s using a Vector Autoregression (VAR) framework. The results indicated that expansionary government spending boosts output in the short term but leads to higher inflation, larger budget deficits, and a decline in output over the medium to long term. On the other hand, tax increases are shown to reduce economic activity in the medium term, while improvements in the public budget balance are short-lived.

Magazzino (2011) examined the nexus between government expenditure and inflation for Mediterranean countries for the period between 1970 and 2009. The study identified a long-term relationship between the proportion of public expenditure and inflation in Cyprus, France, Greece, and Portugal. The Granger causality test results also revealed short-term evidence of a one-way causal link from inflation to public spending in Cyprus,

France, and Spain, while a two-way causal relationship is observed in Italy, Malta, and Portugal. On the other hand, Oyerinde (2019) assessed a nexus between government expenditure and inflation in Nigeria using secondary data covering the period from 1980 to 2017. The study used Johansen Cointegration and the vector error correction model (VECM). The findings revealed not only a bidirectional relationship among the variables but also a strong connection between government expenditure and the inflation rate, with significant effects persisting from the short-run into the long-run.

Ugwuanyi and Ugwunta (2017) examined the effect of fiscal policy variables on economic growth in some selected sub-Sahara Africa Countries. Their study found that government expenditure and taxes have significant positive effect on economic growth on sub-Saharan African countries. As such, the study concluded that fiscal policy variables have linear and symmetric effects on economic growth in the region. In a related study, Bello et al. (2019) examined the impact of fiscal policy variables on economic performance in Nigeria using time series data from 1981 to 2016. From the results they reported that while government expenditure had a significant positive effect on economic growth, government revenue had an insignificant positive effect on growth.

Nguyen (2019) examined the relationship between government spending and inflation using data from Vietnam, Indonesia, and India. The study's conclusions showed that public spending had a statistically significant long-term effect on inflation in all three nations. The findings also indicated that although government spending in Indonesia has a short-term negative impact on inflation, in India there is a short-term positive impact on inflation, and in Vietnam the opposite is true, with public spending having a short-term negative impact on inflation.

Egbulonu and Amadi (2016) examined the effects of fiscal policy on inflation in Nigeria, utilizing time series data on government expenditure, tax revenue, government debt stock, and inflation for the period 1970 to 2013. The Johansen co-integration test was used to determine the presence of a long-run relationship among the variables, while the Error Correction Model (ECM) assessed the speed at which short-run deviations adjust to long-run equilibrium. The results revealed a positive but statistically insignificant relationship between both government expenditure and tax revenue with inflation. However,

government debt stock was found to have a positive and statistically significant impact on inflation. Based on these findings, the study recommended that the government should reduce both domestic and external borrowing, enhance its tax administration to minimize tax evasion and avoidance, and adopt an appropriate mix of fiscal and monetary policies to manage inflation effectively.

Otto and Ukpere (2015) conducted a study on fiscal policy and inflation in Nigeria over a 32-year period. Based on their analysis using ordinary least squares regression, they observed that while fiscal policy does affect inflation, the effect is statistically insignificant, as such, advocated for increased government spending. Similarly, Samson et al. (2023) analyzed the relationship between fiscal policy and inflation in Nigeria using data from 1981 to 2021. To assess the properties of the data, the study employed the Augmented Dickey-Fuller (ADF) unit root test and the Johansen co-integration test to determine the presence of long-term equilibrium relationships among variables. Subsequently, the data were evaluated using Ordinary Least Squares (OLS) and a Parsimonious Error Correction Model. The findings indicated that both government expenditure and revenue had a positive association with inflation, although the impact of government revenue was not statistically significant. Based on these outcomes, the study recommended that fiscal policy at all levels of government should be applied with caution to prevent inflationary pressures and their potential adverse effects on citizens' well-being.

Kunwar (2019) studied government spending and output growth in Nepal between 1975 and 2018. The findings of an ARDL model reveal that, government expenditure has positive effects on output growth. The same results were also reported by Shevchuk and Kopych (2018), Deskar-Skrbic and Simovic (2017), Franta (2012). Similarly, Ocran (2011) investigated the effects of fiscal policy on South Africa’s economy and found that tax revenues and government expenditure had positive effects on economic growth, whereas budget deficit had insignificant effects. However, Saez et al. (2017) and Barlas (2020) analyzed the effects of government spending on economic performance of the European Union countries and Afghanistan respectively. Both studies found that the economies of these countries are negatively influenced by government spending.

Yusuf and Mohd (2021) analyzed the non-linear effects of fiscal policy on Nigeria's economic from 1980 to 2018. According to the NARDL regression, changes in recurrent expenditure had asymmetrical effects on economic growth. However, the study could be further enhanced by analyzing aggregate government expenditure and incorporating other variables, including tax revenue and public debt, to understand how fiscal policy affect economic performance. Asma and Abdelkader (2021) studied fiscal policy in Algeria from 1980-2018 using the autoregressive distribute lad (ARDL) modelling. From an ARDL regression model, the study found positive effects of government spending on economic growth in Algeria. Therefore, the study recommended that the government should ensure policy consistency and policy reversals are properly checked.

Asteriou et al. (2021) conducted a similar study and found that, a 1% positive change in the spending leads to 0.125% decrease in economic growth. Furthermore, an increase in public debt by 1% reduces economic growth by 0.091 to 0.132% in the long-run. A multiple country analysis can give a better overall picture of the global economic trends, however, it is difficult to draw definitive conclusions due to different economic development level. The study further employed ARDL model that does not account for non-linear relationships between the study variables.

Ferrara et al. (2021) utilized the US data and SVAR modeling to study the effects of fiscal policy on real exchange rates and inflation. Their findings indicated that an increase in government expenditure causes inflationary effects. Similarly, Zang (2022) investigated the dynamics of global inflation in response to China's government spending and found that significant increases in government spending increases consumer prices. However, Jørgensen and Ravn (2022) conducted a study on the US economy focusing on the inflationary response to government spending shocks using SVAR modeling and their findings revealed that prices do not rise following positive government spending shocks, instead the response is negative.

Poku et al. (2022) investigated the effects of government expenditure on economic growth in Ghana between 1970 and 2016. From the study findings, government expenditure had a positive influence on economic growth. similarly, Tendegu et al. (2022) found that, fiscal policy instruments positively influence economic growth. The study recommended

the government allocate more finances to the productive sectors so as to boost economic growth. On the contrary, Asandului et al. (2021) investigated the asymmetric impacts of fiscal policy on economic activity and inflation in 12 European post-communist nations. From the Pooled Mean Group estimation, fiscal policy tool displayed negative effect on both inflation and GDP in the long-run. However, the short-run effects were not statistically significant. Furthermore, the NARDL estimation indicated that fiscal policy influenced inflation. Their key conclusion is that the sampled EU nations experience inflationary expansion due to combined influence of fiscal policy.

2.3.3 Public Debt, Inflation and Output Growth Rate

Using annual data from 1978 to 2005 across 19 OECD countries, Minea and Villieu (2008) observed that the relationship between budget deficits and economic growth is non-linear. Their findings indicate that budget deficits can positively influence economic growth when public debt levels are low. However, when public debt is high, the effect turns negative. The model identified a public debt threshold of approximately 90%, beyond which the relationship between deficits and growth changes direction. In essence, a high debt burden reduces the positive impact of budget deficits on growth and eventually its impact becomes negative when this debt is very high.

Reinhart and Rogoff (2010) studied the relationship between public debt, economic growth, and inflation in 44 countries, revealing distinct outcomes for advanced economies and emerging markets. The study results showed that emerging markets tend to face a more pronounced rise in inflation as debt levels increase that advanced economies. The study also discovered a non-linear relationship between the economic growth and public deb. Similarly, Kumar and Woo (2010) investigated the relationship between public debt and economic growth across advanced and emerging economies. Their findings indicated a nonlinear association, where the negative effects of debt on growth become more pronounced at higher debt levels. Specifically, they found that when public debt exceeds 90% of a country's GDP, each additional 1% increase in the debt ratio leads to a reduction in economic growth by approximately 0.02 percentage points. This suggests that excessive debt burdens can hinder long-term growth prospects.

In a related study, Eberhardt and Presbitero (2014) examined the long-run relationship between public debt and economic growth across a broad set of countries, using dynamic time series techniques and static non-linear model. Their analysis indicated that the debt-growth relationship varies across nations and showed some evidence of a nonlinear pattern over the long term. However, they found no consistent debt threshold that applies universally over time. The study suggested that the widely debated 90% debt limit may stem from flawed empirical design or a misinterpretation of the evidence.

Baum and Rother (2012) conducted a study in 12 countries for the period between 1990 to 2010. The study found out that the debt's impact on the GDP growth is positive and significant. However, this impact will drop up 0 when the debt's rate surpasses 67%. According to them, whenever this rate exceeds 95% of the GDP, the debt's rate would definitely have a negative impact on the economic growth.

Mba et al. (2013) analyzed the effect of domestic debt on economic growth in Nigeria. To empirically determine the relationship between domestic debt and some macroeconomic variables, they employed the error correction model. Evidence from error correction model showed that domestic debt has a direct relationship with GDP and that debt servicing has inverse relationship with GDP. As such, the study recommended that domestic debt should be invested in productive sector of the economy more specifically in the real sector.

Bildirici and Ersin (2007) suggested that inflationary process is unavoidable through the wealth effect with increases in domestic debt and decreasing maturity rates. They argue for emerging countries that inflation spirals experienced by most of these countries could be explained by the cost of domestic debt. Countries experiencing inflationary periods follow interest rate policies resulting from tight monetary policies. This process further increases interest payments and amplifies domestic debt stock. They further argue that a country may eventually secure debts at higher cost and low maturity and further contributing to inflationary pressure.

Similarly, Ahmad et al. (2012) examined the influence of domestic public debt on inflation in Pakistan over the period 1972 to 2009 and identified inflation as a significant challenge

for many nations. From their study findings, they revealed that both the size of domestic debt and the associated debt servicing contribute to rising price levels. They also noted that floating debt primarily treasury bills constitutes the largest share of domestic debt and carries high interest rates. According to results, while this may enhance institutional and household efficiency, it also boosts aggregate demand, thereby exerting upward pressure on prices. They argued that servicing domestic debt is a key driver of Pakistan's budget deficit, which in turn fuels inflation.

On the other hand, Karakaplan (2009) analyzed the effects of external public debt on inflation in 121 countries that included developed, emerging market and developing countries for the period from 1960 to 2004. Results from the study supported the hypothesis that external debt is less inflationary in economies with well-developed financial markets. The study further suggested that the relationships are heterogeneous across countries.

Nguyen (2015) assessed public debt and inflation using data from 1990 to 2014 in 60 developing countries. To investigate this relationship, the study employed the GMM model and found that public debt significantly influenced inflation process in the direction it was directed, whereas inflation greatly impacted public debt in the opposite direction. However, the study used GMM which requires the researcher to specify moment conditions. Selecting appropriate moment conditions can be challenging, and incorrect specification may lead to biased results and hence incorrect conclusions. Similarly, Romero and Marin (2017) examined public debt, inflation and output growth in 52 economies with data from 1961 to 2015. From a vector autoregressive model, for countries with significant levels of public debt, further debt increases have been associated with higher inflation. The findings suggested that, while not statistically significant for developed nations, rising debt strongly correlated with high inflation in emerging countries.

In a related study, Afonso and Ibraimo (2018), examined the effects of public debt in Mozambique using a vector autoregressive (VAR) model. The study found that there is a positive association between public debt and inflation in Mozambique, indicating that higher public debt levels tend to drive up inflation.

Olaoye et al. (2022) analyzed how public debt influences macroeconomic indicators like inflation and exchange rates across 25 Sub-Saharan Africa economies using a panel threshold model. Their findings indicate that public debt significantly increases the inflation rate. The study suggested that, governments in SSA, should adhere to a debt limit set at 60.59% of GDP. However, selecting the appropriate threshold can be challenging, and inappropriate thresholds may lead to biased estimates and incorrect inferences. Aimola and Odhiambo (2021) found similar results in relation to the effect of public debt on inflation in Ghana the period 1983 to 2018.

Yusuf and Mohd (2021) investigated the effect of government debt on economic growth in Nigeria using data from 1980 to 2018 and Autoregressive Distributed Lag method. The results showed that external debt is an impediment to long-term growth while in the short-term it is growth-enhancing. In addition, domestic debt had positive impact on long-term growth while its short-term effect is negative. In the long term and short term, debt service payments led to growth retardation confirming debt overhang effect.

Adedeji et al. (2024) investigated how public debt influences the relationship between taxation and economic growth in sub-Saharan African countries. Drawing on an extended endogenous growth framework, the study utilized a dynamic fixed-effects model to assess both linear and nonlinear dynamics. In the overall sample, the linear analysis reveals that tax indicators positively affect economic growth, irrespective of whether public debt is considered. Conversely, the nonlinear approach reveals a negative relationship between public debt and growth.

Using NARDL model, Sriyana and Ge (2019) examined how Indonesian fiscal policy affected inflation. From their results, inflation responds to fiscal variables asymmetrically both in the long-run and short-run. Similar findings emphasizing the presence of asymmetric impacts have been reported in a number of studies on inflation in different countries, including India and Iran. (Ajaz et al., 2016; Falahi & Hajamini, 2017). In a related study, Aimola and Odhiambo (2022) used the NARDL model to determine whether the effects of public debt in Ghana were symmetric or asymmetric from 1978 to 2019. The NARDL regression model results revealed that increases in public debt corresponded to inflationary increases, thereby establishing asymmetric dynamics. These

study findings highlight the importance of governments to approach increases in public debt with caution to control inflation rates.

Lopes da Veiga et al. (2016) found that the extent of indebtedness influences inflation. Increased public debt were indicative of rising inflation rates. While a multiple-country analysis can give a better overall picture of the global economic trends, drawing definitive conclusions is challenging due to varying levels of economic development. On the contrary, Essien et al. (2016) examined how public sector borrowing in Nigeria from 1970 to 2014 affected output, interest rates, and prices using VAR framework estimating technique. The study concluded that the amount of debt, both domestic and foreign, had no impact on the overall level of prices.

Asma and Abdelkader (2021) analyzed fiscal policy and economic performance in Algeria from 1980 to 2018. The results showed that public debt reduces economic growth. As a study recommendation, the government ensure policy consistency and policy reversals are properly checked for their effects on the economy. Yoong et al. (2020) examined how public debt influences economic growth in Malaysia from 1970 to 2015. From the findings, long-run government expenditure influences GDP. The government should minimize costs while still making sure that there is still enough money to pay for services and promote economic growth.

Asteriou et al. (2021) conducted a similar study and found that, a 1% positive change in the spending leads to 0.125% decrease in economic growth. Furthermore, an increase in public debt by 1% reduces economic growth by 0.091 to 0.132% in the long-run. A multiple country analysis can give a better overall picture of the global economic trends, however, it is difficult to draw definitive conclusions due to different economic development level. The study further employed ARDL model that does not account for non-linear relationships between the study variables.

On the contrary, Pegkas (2020) analyzed how public debt affects economic growth from the year 1995 to 2016 using AMECO data. Using a fully modified least squares approach, the study found that public debt reduces growth in the long-run. AMECO data is limited to macroeconomic indicators and does not cover all countries. Modified least squares

models are not as robust as non-linear models when dealing with outliers. Non-linear models could be used to identify and remove outliers or adjust the model to account for them. Modified least squares models are more prone to over-fitting, which can lead to inaccurate predictions.

2.4 Summary of the Literature Review

Theories on economic growth and inflation provide understanding into how fiscal policies can contribute to growth and control inflation. Classical economists proposed that the economy is best when left on self-correcting mode as they believed that, supply of goods and service creates its own demand and that the government should avoid intervening in economic decisions to avoid crowding out private investments. Keynesian theory advocates for government intervention to influence aggregate demand in the economy through the use of fiscal policy, while endogenous growth is based on the idea that fiscal policy influences economic performance through tax cuts, government spending and budget deficits by increasing investment in physical capital, human capital and technological progress. Rising inflation rates could result from improper execution of economic policies, which can serve as a significant factor in generating inflationary pressures within an economy.

The New Keynesian Economics provide the consistency between the micro and macro-analysis. It aims to explain the short-run economic fluctuations focusing on how prices and wages adjust and why markets do not always clear efficiently. The New Keynesian model sees the economy as returning to full employment once prices can reset so that fiscal policy is only temporarily effective and only if it is conditioned on unexpected demand shocks. Keynes' theory of demand-pull implies that, inflation results from government spending increases or tax reductions. However, if these policies increases aggregate demand in an economy, they can have a demand-pull effect on inflation. Consequently, prices rise as consumers compete for limited goods and services, resulting in inflationary pressures.

Empirical literature on asymmetric effects of fiscal policy on inflation and output growth is still limited in the developing country context as most studies have not accounted for non-linear adjustments in the study variables. Studies on asymmetric effects of fiscal

policy on macroeconomic variables is still limited in developing nations like Kenya. Despite applying various methodologies, these models have not been entirely effective in precisely evaluating the effects. Thus, the study used the non-linear autoregressive distributed lag (NARDL) modelling to fill this gap and accurately assess the impact of fiscal policy. The NARDL model takes into account the asymmetries of fiscal policy due to its approach to error correction and cointegration. Such an analysis will help uncover underlying non-linear adjustments in the study variables.

CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter discusses research design, theoretical framework, empirical model, data collection and analysis techniques and, operationalization and measurement of study variable.

3.2 Research Design

The study employed a causal research design to establish cause-and-effect relationship. The causal research design helps to determine the relationship between the dependent and the independent variables. Thus allowing the study to draw conclusions regarding the nature of the relationship.

3.3 Theoretical Framework

The study estimated two models, the first model analyzed the asymmetric effects of fiscal policy variables on inflation. In this regard, the study adopted the New Keynesian theory by Roberts (1995), which posits that, inflation depends on expected inflation in the next period and the output gap. Therefore, modifying equation 2.1, the New Keynesian model is represented as;

$$INF_t = \beta E_t[INF_{t+1}] + \alpha Y_t \quad (3.1)$$

Where INF_t is the inflation rate at time t, $\beta E_t[INF_{t+1}]$ is the expected inflation in the next period. Y_t is the output gap which is the measure of economic growth based on the Hodrick-Prescott filtered real GDP, while α is the coefficient of the output gap. The proponents of this theory also argue that, fiscal policy influences aggregate demand which in turn affects inflation (Gali, 2015).

The second model adopted the fiscal policy framework proposed by Musgrave (1959) in his theory, which suggests that, changes in fiscal policies can have a direct influence on output growth. This includes changes in taxes, government expenditure and public debt (Tendengu et al., 2022), which is represented as follows;

$$Y_i = f(X_1, X_2, X_3, \ldots\ldots X_j) \quad (3.2)$$

Where Y_i represents output growth, $X_1, X_2, X_3, \ldots.X_j$ are the policy instruments (tax revenue, government spending and public debt).

3.4 Empirical Model

By incorporating government expenditure, tax revenue and public debt into equation 3.1, this study can explore how fiscal policy decisions, government interventions and inflation dynamics interact within the New Keynesian paradigm. Therefore, equation 3.1 was augmented to produce a model of inflation that features fiscal policy variables as follows;

$$INF_t = \beta E_t[INF_{t+1}] + \alpha_1 GS_t + \alpha_2 TR_t + \alpha_3 PD_t + \alpha_4 Y_t + \mu_t \quad (3.3)$$

Stock and Watso (2007) show that in empirical models, previous period's inflation can be used to proxy expected inflation. As such, lagged inflation is added to the right hand side of equation 3.3 to have;

$$INF_t = INF_{t-1} + \alpha_1 GS_t + \alpha_2 TR_t + \alpha_3 PD_t + \alpha_4 Y_t + \mu_t \quad (3.4)$$

Where $\alpha_1, \alpha_2, , \alpha_3$ and α_4 are the coefficients of government spending, tax revenue, public debt and output gap respectively, μ_t is the error term. INF_t represents the inflation rate at time t. INF_{t-1} is the lagged inflation, TR_t, GS_t, and PD_t are tax revenue, government spending and public debt at time t. The study also introduced real interest rate (IRATE) into the model. An increase in interest rates reduces the demand for cash balances, as economic agents prefer to invest in high yielding assets. This shift decreases the amount of money held, effectively reducing money supply which can lead to lower inflation. However, when interest rates reduce, money held for speculative purposes increases, and thus increases money supply which could cause a rise in the level of prices. (Belongia & Ireland, 2015).

$$INF_t = \alpha_0 + INF_{t-1} + \alpha_1 GS_t + \alpha_2 TR_t + \alpha_3 PD_t + \alpha_4 Y_t + \alpha_5 IRATE_t + \mu_t \quad (3.5)$$

Concerning the second model, the study followed M'Amanja and Morrissey (2015), and basing on equation 3.2, presents the relationship between output growth and the regressors as follows;

$$GDP_t = (TR_t + GS_t + PD_t) \quad (3.6)$$

Where TR_t is tax revenue, GS_t is the government spending and PD_t is the public debt, GDP_t is the real gross domestic product at time t. The study further introduced money supply to account for the influence of monetary policy and trade openness. Equation 3.6 is therefore modified to:

$$RGDP_t = \beta_0 + \beta_1 TR_t + \beta_2 GS_t + \beta_3 PD_t + \beta_4 MS_t + \beta_5 TDO_t + \mu_t \quad (3.7)$$

Following Yusuf and Mohd (2023), the study further introduced logarithmic transformation to the models since the study focused on growth changes in variables. Logarithmic transformation is helpful in dealing with skeweness as it transforms skewed data into a more symmetrical form, which makes it easy to identify patterns and trends in the study variables. It also helps to solve post diagnostic problems like heteroscedasticity, by stabilizing the variance of the residual disturbances (Ogun, 2021). Introducing natural logs on both sides of equations 3.5 and 3.7, transforms it into log-log models as follows;

$$LnINF_t = \alpha_0 + LnINF_{t-1} + \alpha_1 LnTR_t + \alpha_2 LnGS_t + \alpha_3 LnPD_t + \alpha_4 LnY_t + \alpha_5 LnIRATE_t + \mu_t \quad (3.8)$$

$$LnRGDP_t = \beta_0 + \beta_1 LnTR_t + \beta_2 LnGS_t + \beta_3 LnPD_t + \beta_4 LnMS_t + \beta_5 LnTDO_t + \mu_t \quad (3.9)$$

Where, $LnINF_{t-1}$ is the lagged inflation in logarithmic form while $LnINF_t$, $LnRGDP_t$, $LnGS_t$, $LnTR_t$, $LnPD_t$, LnY_t[1], $LnMS_t$, $LnIRATE_t$ and $LnTDO_t$, are logarithmic transformation of inflation, output growth, tax revenue, government spending, public debt, money supply, interest rate and the degree of trade openness at time t respectively. α_0 , β_0 are constants, α's and β's are the parameters to be estimated, whereas μ_t is the error term.

To capture both short-run and long-run effects of the regressors, equations 3.8 and 3.9 were rewritten in their error correction forms by formulating ARDL (p, q) models with

[1] Given some values of the output gap are negative, a constant of 1 was added across to make all the values positive in order to introduce natural logarithms

'p' and 'q' representing lags of the dependent and independent variables, respectively (Bahmani-Oskooee & Arize, 2020);

$$\Delta LnINF_t = \alpha_1 + \sum_{i=1}^{p} \alpha_{2i}\Delta LnINF_{t-i} + \sum_{i=0}^{q1} \alpha_{3i}\Delta LnTR_{t-i} + \sum_{i=0}^{q2} \alpha_{4i}\Delta LnGS_{t-i} + \sum_{i=0}^{q3} \alpha_{5i}$$
$$\Delta LnPD_{t-i} + + \sum_{i=0}^{q4} \alpha_{6i}\Delta LnY_{t-i} + \sum_{i=0}^{q5} \alpha_{7i}\Delta LnIRATE_{t-i} + \varphi_1 LnTR_{t-1} + \varphi_2 LnGS_{t-1} +$$
$$\varphi_3 LnPD_{t-1} + \varphi_4 LnY_{t-1} + \varphi_5 LnIRATE_{t-1} + \mu_t \quad (3.10)$$

$$\Delta LnRGDP_t = \beta_1 + \sum_{i=1}^{p} \beta_{2i}\Delta LnGDP_{t-i} + \sum_{i=0}^{q1} \beta_{3i}\Delta LnTR_{t-i} + \sum_{i=0}^{q2} \beta_{4i}\Delta LnGS_{t-i} + \sum_{i=0}^{q3} \beta_{5i}$$
$$\Delta LnPD_{t-i} + \sum_{i=0}^{q4} \beta_{6i}\Delta LnMS_{t-i} + \sum_{i=0}^{q5} \beta_{7i}\Delta LnTDO_{t-i} + \rho_1 LnTR_{t-1} + \rho_2 LnGS_{t-1} +$$
$$\rho_3 LnPD_{t-1} + \rho_4 LnMS_{t-1} + \rho_5 LnTDO_{t-1} + \varepsilon_t \quad (3.11)$$

Where α's and β's represents the short-run parameters, while φ's and ρ's are the long-run coefficients respectively. In equation 3.10 and 3.11, it is assumed that changes in fiscal policy exhibit symmetric effects on inflation and output growth. however, when the effects of increased fiscal policy variables differ from those of decreased fiscal policy variables, it introduces the possibility of asymmetry. Therefore, the study employs the NARDL model by Shin et al. (2014), which is an extension of the ARDL model proposed by (Pesaran et al., 2001). The NARDL takes into account the non-linear adjustments into the effect of fiscal policy on inflation and output growth in both the short-run and long-run (Alsamara et al., 2017). Following Asandului et al. (2021), the technique decomposes the fiscal policy variables only into their negative and positive changes. Following Shin et al. (2014) approach, the partial sum approach is conducted as follows;

$$POS_t = X_t^+ = \sum_{j=1}^{t} \Delta LnX_j^+ = \sum_{j=1}^{t} \max(\Delta LnX_j, 0) \quad (3.12)$$

$$NEG_t = X_t^- = \sum_{j=1}^{t} \Delta LnX_j^- = \sum_{j=1}^{t} \min(\Delta LnX_j, 0) \quad (3.13)$$

Where X_t = (TR_t, GS_t, PD_t). Going back to equations 3.10 and 3.11, the study replaced LnGS, LnTR and LnPD with their respective negative and positive changes from equations 3.12 and 3.13. Therefore, the transformed models are represented as:

$$\Delta LnINF_t = \alpha_1 + \sum_{i=1}^{p} \alpha_{2i}\Delta LnINF_{t-i} + \sum_{i=0}^{q1} \alpha_{3i}\Delta LnTR_{t-i}^+ + \sum_{i=0}^{q2} \alpha_{4i}\Delta LnTR_{t-i}^- + \sum_{i=0}^{q3} \alpha_{5i}$$
$$\Delta LnGS_{t-i}^+ + \sum_{i=0}^{q4} \alpha_{6i}\Delta LnGS_{t-i}^- + \sum_{i=0}^{q5} \alpha_{7i}\Delta LnPD_{t-i}^+ + \sum_{i=0}^{q6} \alpha_{8i}\Delta LnPD_{t-i}^-$$

$$+ \sum_{i=0}^{q7} \alpha_{9i} \Delta LnY_{t-i} + \sum_{i=0}^{q8} \alpha_{10i} \Delta LnIRATE_{t-i} + \varphi_1 LnINF_{t-1} + \varphi_2 LnTR_{t-1}^{+} + \varphi_3 LnTR_{t-1}^{-} + \varphi_4 LnGS_{t-1}^{+} + \varphi_5 LnGS_{t-1}^{-} + \varphi_6 LnPD_{t-1}^{+} + \varphi_7 LnPD_{t-1}^{-} + \varphi_8 LnY_{t-1} + \varphi_9 LnIRATE_{t-1} + \mu_t \quad (3.14)$$

$$\Delta LnRGDP_t = \beta_1 + \sum_{i=1}^{p} \beta_{2i} \Delta LnRGDP_{t-i} + \sum_{i=0}^{q1} \beta_{3i} \Delta LnTR_{t-i}^{+} + \sum_{i=0}^{q2} \beta_{4i} \Delta LnTR_{t-i}^{-} + \sum_{i=0}^{q3} \beta_{5i} \Delta LnGS_{t-i}^{+} + \sum_{i=0}^{q4} \beta_{6i} \Delta LnGS_{t-i}^{-} + \sum_{i=0}^{q5} \beta_{7i} \Delta LnPD_{t-i}^{+} + \sum_{i=0}^{q6} \beta_{8i} \Delta LnPD_{t-i}^{-} + \sum_{i=0}^{q7} \beta_{9i} \Delta LnMS_{t-i} + \sum_{i=0}^{q8} \beta_{10i} \Delta LnTDO_{t-i} + \rho_1 LnRGDP_{t-1} + \rho_2 LnTR_{t-1}^{+} + \rho_3 LnTR_{t-1}^{-} + \rho_4 LnGS_{t-1}^{+} + \rho_5 LnGS_{t-1}^{-} + \rho_6 LnPD_{t-1}^{+} + \rho_7 LnPD_{t-1}^{-} + \rho_8 LnMS_{t-1} + \rho_9 LnTDO_{t-1} + \varepsilon_t \quad (3.15)$$

Where Δ is the first difference, LnGS, LnTR, LnPD, LnIRATE, LnY, LnMS and LnTDO are the logarithmic transformations of government expenditure, tax revenue, public debt, interest rate, output gap, money supply and trade openness respectively. Shin et al. (2014) proposed the bounds test for examining the long-run relationship using the F-test and comparing the statistic with the upper critical value (I (1)) under the following hypothesis set up:

$$\text{Ho: } \rho_1 = \rho_2 = \rho_3 = \ldots\ldots\ldots = \rho_7 = 0 \text{ against Ha: } \rho_1 \neq \rho_2 \neq \rho_3 \neq \ldots\ldots\ldots\ldots\ldots \neq \rho_7 \neq 0 \quad (3.16)$$

Specifically, a greater statistic indicates the presence of a long-run cointegrating relationship, regardless of the integration order. Whereas a lower F-statistic implies no evidence of cointegration. However, if the F-statistic lies within the critical bounds, cointegration results are considered inconclusive (Bahmani-Oskooee et al., 2021). Given the existence of cointegration, the study proceeded to estimate the Wald test to assess the statistical difference in how inflation and output growth respond to negative and positive changes of fiscal policy variables.

3.5 Data Sources, Operationalization and Measurement of Study Variables

Annual time series data for Kenya covering the period between 1991 and 2021, was used for the study. The Consumer Price Index (CPI) was used as a measure of inflation (INF),

Government spending (GS), public debt (PD) and tax revenue (TR) were measured as percentages of GDP. Data on GDP, inflation and government spending were sourced from the World Development Indicators database of the World Bank. Data on tax revenue and public debt were extracted from Kenya National Bureau of Statistics (KNBS). The variables were measured in Millions of Kenyan Shilling and subsequently converted to percentage of GDP by dividing their values by the total GDP of the corresponding year. Expressing the variables as a percentage of GDP takes into account the changes in the performance of the economy (Onofrei et al., 2022). Data on interest rate, money supply and trade openness were obtained from the World Development Indicators database of the World Bank, while output gap was generated using the Hodrick-Prescott filter using GDP data. Table 3.1 presents the study variables and their measurements.

Table 3.1: Operationalization and Measurement of Study Variables

Variable Name	Type of the Variable	Data Sources	Measurement
Inflation (INF)	Dependent variable	World Development Indicators database of the World Bank	Consumer Price Index (CPI)
Output growth (RGDP)	Dependent variable	World Development Indicators database of the World Bank	Gross Domestic Product (GDP)
Government Expenditure (GE)	Independent variable	World Development Indicators database of the World Bank	Government expenditure as a percentage of GDP
Tax revenue (TR)	Independent variable	Kenya National Bureau of Statistics (KNBS).	Tax revenue as a percentage of GDP

Public Debt (PD)	Independent variable	Kenya National Bureau of Statistics (KNBS).	Total public debt as a percentage of GDP
Output Gap (Y)	Control variable	Generated using the Hodrick-Prescott filter with GDP data obtained from World Development Indicators database of the World Bank	Expressed as a Percentage of Potential Output
Interest rate (IRATE)	Control variable	World Development Indicators database of the World Bank	Expressed as a percentage
Money Supply (MS)	Control variable	World Development Indicators database of the World Bank	Expressed as a percentage of GDP
Trade Openness (TDO)	Control Variable	World Development Indicators database of the World Bank	Expressed as the sum of the value of exports and imports as a percentage of GDP

3.6 Diagnostic Tests

3.6.1 Unit Root Test

Non-linear autoregressive distributed lag (NARDL) model requires variables to be integrated of either order 0 or order 1 or a combination of both, but not be integrated of an order greater than one. Therefore, the study employed the Zivot and Andrews (1992) unit root test, which accounts for a single structural break to examine the order of integration of the variables.

3.6.2 Lag Length Selection

In order to determine the best lag length for cointegration, the study employed the Akaike Information Criteria (AIC). AIC, specifically, serves as a measure for assessing the comparative effectiveness of a predictive method as it brings the balance between the quality of fit and the level of complexity. Smaller AIC values signify less loss of information and indicates a superior fit (Yusuf & Mohd, 2023).

3.6.3 Testing for Model Misspecification

To identify the specification error in the NARDL model, the study used the Ramsey's RESET test. If a model is not accurately representing the data, over-fitting or under-fitting of the data will lead to poor performance of the model (Lotfi et al., 2022). The null hypothesis of the test states that the model is well specified.

3.6.4 Test for Heteroskedasticity

The Breusch-Pagan-Godfrey test was used to test the stability in variances of the NARDL model residuals, by evaluating the null hypothesis of a constant variance.

3.6.5 Test for Autocorrelation

The study used the Breusch-Godfrey test to determine if the residuals of the regression model exhibited the problem of autocorrelation. The test’s null hypothesis is a statement of no autocorrelation.

3.6.6 Stability Test

Brown et al. (1975) developed Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests for stability. The study employed these tests to determine the stability of the non-linear autoregressive distributed lag (NARDL) modelling estimations. These tests examined cumulative sum of the residuals and cumulative sum of the squares of the residuals of the model respectively (Ahmed, 2021). The tests test a null hypothesis of a stable model.

CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the study results, discussions and interpretations.

4.2 Descriptive Statistics

Table 4.1 presents the descriptive statistics. It offers information on measures of dispersion, spread and adherence to normal distribution and central tendency.

Table 4.1: Descriptive Statistics

Variable	Mean	Std.Dev.	Skewness	Kurtosis	Jarque Bera	Probability	Observations
INF	11.221	9.443	2.088	7.401	47.551	0.000	31
RGDP	3.694	2.287	-0.051	2.050	1.179	0.555	31
TR	19.387	2.899	1.346	4.096	10.919	0.004	31
GS	16.58	6.108	0.296	1.319	4.105	0.128	31
PD	47.412	11.954	1.037	3.445	5.816	0.055	31
IRATE	18.971	6.949	1.0891	3.017	6.128	0.047	31
Y	-0.002	1.619	0.642	3.999	3.4199	0.181	31
MS	37.544	2.7501	-0.155	3.092	0.135	0.935	31
TDO	51.935	6.990	-0.516	1.929	2.856	0.239	31

Note: INF, RGDP, TR, PD, GS, IRATE, Y, MS and TDO stands for inflation, real gross domestic product, tax revenue, public debt, government expenditure, interest rate, output gap, money supply and the degree of trade openness respectively.

Source: Own computation using data from World Development Indicators database of the World Bank and from the Kenya National Bureau of Statistics (KNBS).

As highlighted by Yusuf and Mohd (2023), standard deviation indicates the extent to which each variable deviates from its mean. Table 4.1 reveal a broad dispersion of the data. Specifically, INF, PD, GS and TDO exhibit higher standard deviations of 9.432, 11.953, 6.108 and 6.990 respectively. According to Tenai, (2020), in order to assess asymmetry in the data, skewness values are examined. All the examined variables displayed positive skewness except for RGDP, MS and TDO. Both RGDP, GS and TD displayed a platykurtic distribution in terms of kurtosis, with kurtosis values less than 3, indicating less frequent and less extreme outliers compared to a normal distribution. In contrast, INF, TR, PD, Y, IRATE and MS demonstrate a leptokurtic distribution, with values greater than 3. The Jarque–Bera statistics takes into account both skewness and kurtosis when evaluating how well a sample of data fits the normal distribution (Bastianin, 2020). As indicated in Table 4.1, RGDP, PD and GS reveal a normal distribution.

Table 4.2: Descriptive Statistics of Logarithmic Transformations

Variable	Mean	Std. Dev.	Skewness	Kurtosis	Jarque Bera	Probability	Observations
LnINF	2.157	0.725	0.056	3.492	0.329	0.848	31
LnRGDP	0.944	0.059	-1.099	2.847	6.273	0.043	31
LnTR	2.955	0.138	1.106	3.339	6.472	0.039	31
LnGS	2.742	0.369	0.163	1.290	3.913	0.141	31
LnPD	3.831	0.234	0.652	2.411	2.643	0.267	31
LnIRATE	2.886	0.331	0.692	2.300	3.107	0.012	31
LnY	-0.0024	0.619	0.642	2.999	3.419	0.081	31
LnMS	3.623	0.074	-0.389	3.357	0.949	0.622	31
LnTDO	3.941	0.141	-0.658	2.132	3.210	0.201	31

Upon transforming the variables into their logarithmic forms, all the variables exhibit a low standard deviation less than 1 as shown in Table 4.2, meaning that they are clustered closely around the mean. In terms of skewness, all variables are normally skewed except for LnRGDP and LnTR, which have the skewness values of -1.376 and 1.106 respectively. Regarding kurtosis, only the values for the variables LnPD, LnGS, LnIRATE and LnTDO have a kurtosis less than the normal distribution of 3, which according to Ali et al. (2022), implies a flattened curve relative to normal distribution. Notably, the logarithmic transformation results in inflation becoming normally distributed while tax revenue does not exhibit similar improvements in normality. However, according to Rahman and Islam (2020), normality of data is not a necessity for applying the NARDL approach utilized in the study.

4.3 Zivot Andrews Unit Root Test

Zivot and Andrews (1992) developed a unit root that accounts for a structural break, at both the intercept and trend. In Table 4.3, 2009, 2004, 2010, 2003, 2008, 2014 and 2005 represents the structural break points. The results indicate that inflation, output growth, tax revenue and output gap are stationary at first difference. On the other hand, government spending, public debt, interest rates, money supply and trade openness are stationary at levels.

Table 4.3: Unit Root Results with Structural Breaks

variable	t-statistic	Break year	Decision
INF	-11.301***	2009	I (1)
RGDP	-5.929**	2004	I (1)
PD	-3.639**	2010	I (0)
TR	-5.245***	2003	I (1)
GS	-2.752***	2008	I (0)
Y	-5.357**	2003	I (1)
IRATE	-5.718***	2003	I (0)
MS	-5.408***	2014	I (0)
TDO	-4.999**	2005	I (0)

Notes: The significance levels **, *** correspond to 5% and 1% respectively.

4.4 NARDL Regression Model.

To determine the most suitable lag lengths for cointegration, the Akaike Information Criteria (AIC) was chosen from among the several criteria for the study. The optimal choice is shown by the smaller value. Therefore, the study employed a maximum of 2 lags as indicated by the smallest value AIC in Table 4.4.

Table 4.4: Results for Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-28.567	NA	5.70e-07	5.881	5.818	5.591
1	97.052	190.940*	3.38e-09	-5.364	-3.902*	-4.958
2	126.569	33.059	3.10e-09*	-5.725*	-3.044	-4.982*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Therefore, model 3.14 was structured using a lag structure of (2, 2, 0, 2, 1, 2, 2, 1, 2), while model 3.15 which analyzed how fiscal policy affected output growth was structured using a lag structure of (1, 2, 2, 2, 2, 1, 2, 0, 2). Both structures were determined to be the most effective and efficient choice for this study.

Table 4.5: Results of the NARDL Regression Model for Dependent Variable (LnINF)

Short-run Coefficients			
Variable	Coefficient	Std. Error	t-Statistic
D(LnINF(-1))	0.417	0.082	5.109***
D(LnGS_POS)	6.384	1.564	4.082***
D(LnGS_POS(-1))	-5.099	1.439	-3.544***
D(LnGS_NEG)	-0.118	2.855	-0.041
D(LnPD_POS)	1.828	1.623	1.126
D(LnPD_POS(-1))	3.158	1.092	2.893**
D(LnPD_NEG)	-3.019	1.114	-2.711**
D(LnTR_POS)	1.559	3.566	0.437
D(LnTR_POS(-1))	3.969	2.247	1.767
D(LnTR_NEG)	2.189	3.359	0.651
D(LnIRATE)	-0.999	0.508	-1.969*
D(LnIRATE(-1))	2.046	0.482	4.242***
D(LnY)	0.045	0.024	1.897*
CointEq(-1)	-1.127	0.148	-14.311***
Long-run Coefficients			
Variable	Coefficient	Std. Error	t-Statistic
LnGS_POS	0.526	0.510	1.031
LnGS_NEG	-0.056	1.345	-0.041
LnPD_POS	-0.462	0.353	-1.307
LnPD_NEG	-1.419	0.509	-2.784**
LnTR_POS	0.134	1.518	0.088
LnTR_NEG	4.443	0.854	5.201***
LnIRATE	-1.626	0.243	-6.704***
LnY	0.021	0.011	1.965*
C	7.726	1.052	7.341***

Note*:* LnGS, LnTR, LnPD, LnY and LnIRATE are the logarithmic transformations of government spending, tax revenue, public debt, output gap and interest rates, respectively. The significance levels *, **, *** correspond to 10%, 5%, and 1% respectively.

Table 4.5 presents the empirical results of the NARDL regression model. The findings indicate that the previous level of inflation has a significant positive effect on the current level of inflation, implying inflation persistence. A positive relationship between output gap and inflation was also established, implying that a 1% increase in output gap increases inflation by 0.05% at the 1% significance level. The interest rate equally has a negative effect on inflation, whereby a 1% increase in interest rates cause inflation to fall by 0.99%. The findings also show a positive relationship between inflation and government spending, whereby a 1% positive change in government spending increases inflation by

6.38%. These results align with those of Sriyana and Ge (2019), Ferrara et al. (2021), Zang (2022), Jørgensen and Ravn (2022) and Udoh and Kokoette (2023) who found that increases in government spending increase the level of inflation. However, the findings are contrary to those of Olayungbo (2013) and Atan and Effiong (2021) who found that decreases in government spending leads to high inflation. The positive linkage between increases in government spending and inflation is in line with the demand-pull inflation theory, which posits that expansionary fiscal policy increases aggregate demand which eventually leads to rise in price levels.

The findings also suggest that previous increases in public debt have inflationary effects. Notably, for every 1% increase in the previous period's public debt, current inflation rates rise by 3.16%. Decreases in public debt result to increases in inflation rates as well. Quantitatively, 1% decrease in public debt increases inflation by 3.02%. However, these results are contrary to those of Nguyen (2015), Romero and Marin (2017), Aimola and Odhiambo (2021), Aimola and Odhiambo (2022), Olaoye et al. (2022) who found that increases in public debt increase the level of inflation.

In the long-run, decreases in public debt was also found to increase the level of inflation, implying that the short-run effects persist into the long-run. The results also indicate that 1% decrease in tax revenue leads to a reduction in the level of inflation by 4.44%. A reduction in taxes decreases production cost which could generally lead to lower prices as businesses can offer goods and services at a lower cost reducing the overall level of prices in the economy. Just like the short-run findings, interest rate has a long-run negative effect on inflation, while the output gap shows a consistent positive relationship with inflation. The error correction term points to a long-run equilibrium relationship among the variables, as evidenced by the negative and significant coefficient. However, the error correction term of -1.13 implies that the correction process is oscillatory in nature and will decay and adjust to the equilibrium value in the long-run (Narayan & Smyth, 2006).

Table 4.6: Results of the NARDL Regression Model for Dependent Variable (LnRGDP)

Short-run Coefficients			
Variable	Coefficient	Std. Error	t-Statistic
D(LnGS_POS)	-0.021	0.071	-0.291
D(LnGS_POS(-1))	0.047	0.034	1.395
D(LnGS_NEG)	0.277	0.125	2.213*
D(LnGS_NEG(-1))	0.335	0.169	1.989
D(LnPD_POS)	-0.147	0.054	-2.706**
D(LnPD_POS(-1))	-0.228	0.082	-2.793**
D(LnPD_NEG)	-0.019	0.078	-0.248
D(LnPD_NEG(-1))	0.237	0.097	2.453*
D(LnTR_POS)	-0.024	0.111	-0.218
D(LnTR_NEG)	-0.173	0.067	-2.566**
D(LnTR_NEG(-1))	-0.235	0.045	-5.175***
D(LnTDO)	1.957	0.584	3.350**
D(LnMS)	-0.021	0.031	-0.687
D(LnMS(-1))	-0.142	0.036	-3.924**
CointEq(-1)	-1.429	0.175	-8.179***
Long Run Coefficients			
Variable	Coefficient	Std. Error	t-Statistic
LnGS_POS	0.090	0.041	2.413*
LnGS_NEG	0.203	0.100	2.019*
LnPD_POS	0.056	0.034	1.627
LnPD_NEG	-0.073	0.050	-1.452
LnTR_POS	-0.297	0.111	-2.678**
LnTR_NEG	0.158	0.092	1.712
LnTDO	1.369	0.499	2.741**
LnMS	0.182	0.048	3.794**
C	-0.248	0.122	-2.031*

Note*:* LnGS, LnTR, LnPD, LnTDO and LnMS are the logarithmic transformations of government spending, tax revenue, public debt, trade openness and money supply, respectively. The significance levels *, **, *** correspond to 10%, 5%, and 1% respectively.

The short-run findings in Table 4.6 indicate the presence a negative relationship between the previous level of money supply and current output growth, implying that a 1% increase in money supply reduces the current output level by 0.14% at the 5% significance level.

The findings also reveal a negative relationship between output growth and increases in public debt, whereby a 1% positive change in public debt reduces output by 0.15% at 5% level of significance. This aligns with the results of Pegkas (2020), Yoong et al. (2020), Asma and Abdelkader (2021) and Asteriou et al. (2021). The result infers that increase in public debt could be used to fund non-productive projects or projects of less value to the economy. Alternatively, it could be attributed to crowding out productive investments. Similarly, the previous levels of increases in public debt reduce the current level of output growth. On the other hand, a positive relationship between trade openness and output growth is also established whereby a 1% increase in trade openness cause output to rise by 1.96%.

The results also indicate that a 1% negative change in tax revenue lead to 0.17% rise in output growth which is in support of the findings of studies such as Ocran (2011); Ali et al. (2018); (Adegboyo et al., 2021); Wisdom (2014); Obo et al. (2018); Tsaurai (2021) and Alinaghi and Reed (2021). Decreases in tax revenue can lead to increases in the disposable income of consumers which could in turn increase the level of aggregate demand and subsequently reduce the output level. The previous level of decreases in tax revenue was also found to increase the level of output. However, positive changes in tax revenue had no significant effect on output growth. The results from the NARDL model also revealed that decreases in government spending reduce output growth in the short-run. A 1% decrease in government spending causes a 0.28% decline in economic growth. Decreases in government spending leads to a reduction in aggregate demand which could in turn reduce the level of output.

In the long-run, the results indicate a positive relationship between trade openness and output growth, implying that a 1% increase in trade openness increases output growth by 1.37% at the 5% significance level. A positive relationship between money supply and output growth was also established, whereby a 1% increase in money supply cause output to rise by 0.18%. The effect of public debt on output growth was insignificant in the long-run. Increases in government spending was also found to increase the level of output growth, whereby, a 1% increase in government spending cause output to increase by 0.10%. These results align with those of Ocran (2011), Franta (2012), Deskar-Skrbic and

Simovic (2017) (Shevchuk and Kopych (2018), Kunwar (2019), Asma and Abdelkader (2021) and Poku et al. (2022) who found that increases in government spending increase economic growth. However, the results contradict that of Alesina and Ardagna (2010), Saez (2017), Miftahu (2018) and Barlas (2020) who found that the economies of the examined countries are negatively influenced by government spending. Decreases in government spending was also found to reduce output growth, implying that the short-run effects persist into the long-run. The results also indicated that 1% increase in tax revenue lead to a reduction in the level of output growth by 0.30%, supporting the findings of Furceri and Karra (2009); Ahmad et al. (2018); Attah et al. (2022) and Nguyen and Darsono (2022).

The error correction term points to a long-run equilibrium relationship among the variables, as evidenced by the negative and significant coefficient. However, the error correction term of -1.43 implies that the correction process is oscillatory in nature and will decay and adjust to the equilibrium value in the long-run (Narayan & Smyth, 2006).

4.5 Cointegration Results

The bounds test for identifying asymmetrical cointegration is determined based on the lags selected by the AIC. This test employed the F-statistic, and according to Table 4.7, the F-statistic values are greater than the upper critical value (I (1)) at all significance levels. This provides evidence of a cointegrating relationship among the variables.

Table 4.7: Results of NARDL Bound Test.

For Dependent Variable LnINF			For Dependent Variable LnRGDP		
Test Statistic	Value	k	Test statistic	value	k
F-statistic	12.591	8	F- statistics	7.159	6
Critical Value Bounds			Critical Value Bounds		
Significance	I0 Bound	I1 Bound	Significance	I0 Bound	I1 Bound
10%	1.95	3.06	10%	2.12	3.23
5%	2.22	3.39	5%	2.45	3.61
2.5%	2.48	2.48	2.5%	2.75	3.99
1%	2.79	4.1	1%	3.15	4.43

On the basis of the cointegration results, the study proceeded to estimate the Wald test to examine the statistical differences in the response of inflation to the negative and positive changes in fiscal policy variables, in both the long-run and short-run. As illustrated in Table 4.8, there exists a statistical difference in the response of inflation to positive and negative changes in public debt and government spending in the log-run. That is, the positive effects of public debt and government spending have a significantly different effect from the negative effects. Positive changes in government spending have a greater effect in increasing inflation compared to increases caused by negative changes in government spending. Similarly, negative changes in public debt increases inflation more than the positive changes in it. In the short-run, the effects of government spending are asymmetric while the effects of tax revenue are symmetric.

Based on the findings, assuming linearity between economic variables can obscure the true nature of their relationships, resulting in potentially unreliable findings due to the prevalence of non-linear relationships (Bussiere, 2013). As a result, the findings highlight the significance of taking asymmetry into account when analyzing the effects of fiscal policy. The existence of asymmetric effects of fiscal policies on inflation can be due to factors such as liquidity constraints and the tendency of consumption, investment and prices to adjust downwards (Bhat & Sharma, 2020). This rigidity might result to inflationary patterns since the levels of consumption, investment and even prices remain persistently high despite the reduction in government spending.

Table 4.8: Wald Test Results for Dependent Variable (LnINF).

Long-run Asymmetry Test		
Variable	Statistic	Decision
LnPD_POS and LnPD_NEG	-2.606**	Presence of asymmetry
LnGS_POS and LnGS_NEG	3.158**	Presence of asymmetry
LnTR_POS and LnTR_NEG	-0.655	No asymmetry
Short-run Asymmetry Test		
D(LnTR_POS) and D(LnTR_NEG)	1.046	No asymmetry
D(LnGS_POS) and D(LnGS_NEG)	-1.986*	Presence of asymmetry

Note: The significance levels * and ** correspond to 10% and 5% respectively.

Concerning output growth, the results from the Wald test indicated that the response of output growth to increases and reductions in public debt and tax revenue in both the short-run and long-run are symmetric as illustrated in Table 4.9. However, the positive effects of government spending had significantly different effect from their negative effects, implying that the effects of government spending on output growth are asymmetric in nature in both the short-run and long-run.

Table 4.9: Wald Test Results for Dependent Variable (LnRGDP)

Long-run Asymmetry test		
Variable	Statistic	Decision
LnPD_POS and LnPD_NEG	1.275	No asymmetry
LnGS_POS and LnGS_NEG	-2.151**	Presence of asymmetry
LnTR_POS and LnTR_NEG	-0.566	No asymmetry
Short-run Asymmetry test		
LnGS_POS and LnGS_NEG	3.750***	Presence of asymmetry

Note: The significance levels * and ** correspond to 10% and 5% respectively

Figure 4.1 and 4.2 present graphs of dynamic multiplier effects, demonstrating the effects of positive and negative changes in government spending and public debt on inflation. The positive and negative plots on the graph depict an asymmetric curve, showing adjustments of inflation at different periods

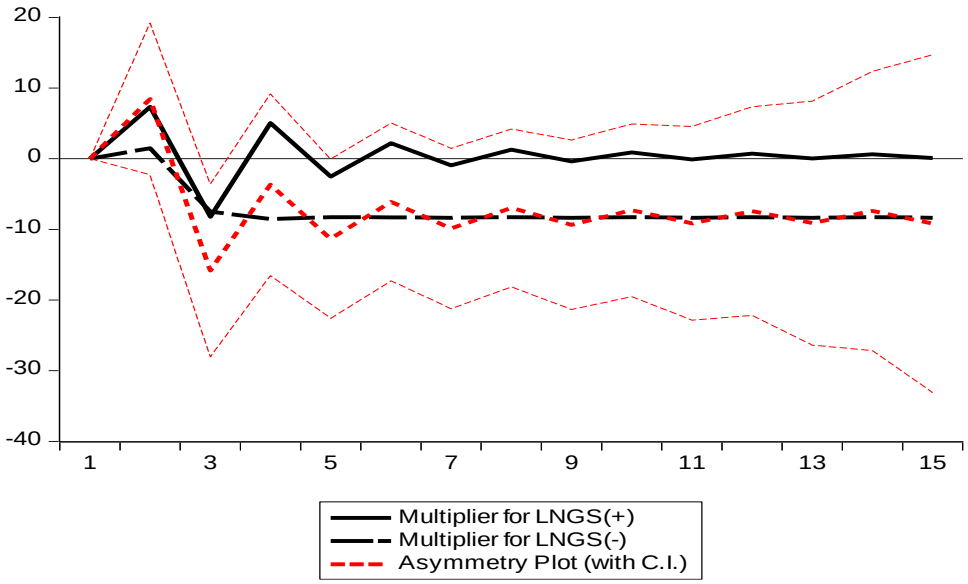

Figure 4.1: Dynamic Multiplier of Government Spending (GS) on Inflation

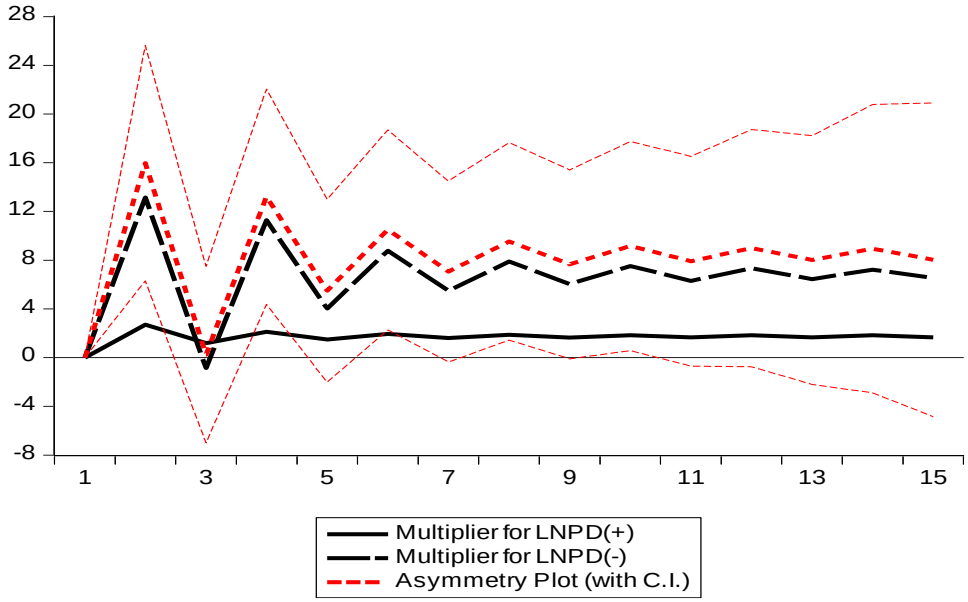

Figure 4.2: Dynamic Multiplier of Public Debt (PD) on Inflation

4.6 Diagnostic Tests

To evaluate the reliability of residual coefficients, various diagnostic tests were performed. Breusch-Godfrey Lagrange Multiplier (LM) was used to determine if the residuals of the regression model exhibit serial correlation. The findings reveal no evidence of serial correlation at all the levels of significance. Additionally, the study employed the Breusch-Pagan-Godfrey test to examine heteroscedasticity. From the results

in Table 4.10, the study fails to reject the test's null hypothesis and conclude that the residuals are homoscedastic. To prevent over- or under-fitting of the data, which could result in poor performance, the Ramsey's RESET test is used to examine presence of specification errors in the model (Lotfi et al., 2022). Since the p-values of 0.326 and 0.217 exceeds all the significance levels, the null hypothesis of a well-specified model is accepted. The results are summarized in Table 4.10.

Table 4.10: NARDL Diagnostic Tests Results.

LnINF				LnRGDP		Conclusion
Problem	Test	F-statistic	P-value	F-statistic	P-value	
Serial correlation	Breusch-Godfrey LM test	2.581	0.176	2.759	0.173	No serial correlation
Heteroskedasicity	Breusch-Pagan-Godfrey	1.877	0.183	0.798	0.681	No heteroskedas-icity
Specification error	Ramsey RESET	1.118	0.326	2.140	0.217	Both models are well specified.

4.7 Stability Test

To evaluate the stability of the non-linear autoregressive distributed lag (NARDL) modelling estimates, the Cumulative Sum of Recursive Residuals (CUSUM) and Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests developed by Brown et al. (1975) were used in the study. The null hypothesis of the tests is a statement of a stable long-run and short-run estimates. Figure 4.3 and 4.5 demonstrate a stable model since CUSUM line's plot lies within the 5% significance level. Further, the CUSUMQ graph is used to examine the models' stability condition, where the line indicates that the models are stable at the 5% significance level. Figure 4.3 and 4.4 present the test plots for the dependent variable LnINF while Figure 4.5 and 4.6 present the test plots for the dependent variable LnRGDP.

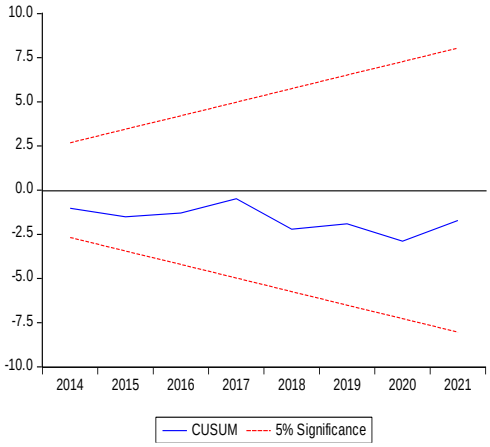

Figure 4.3: CUSUM test plot

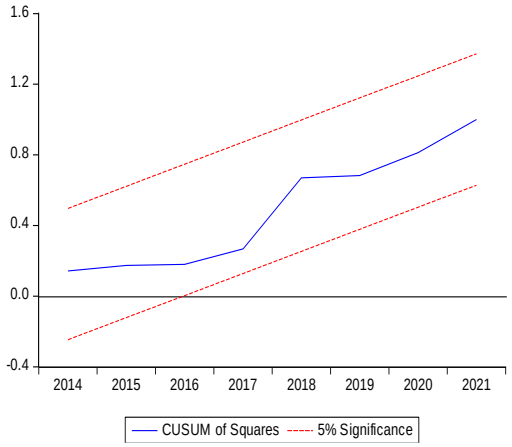

Figure 4.4: CUSUM of squares test plot

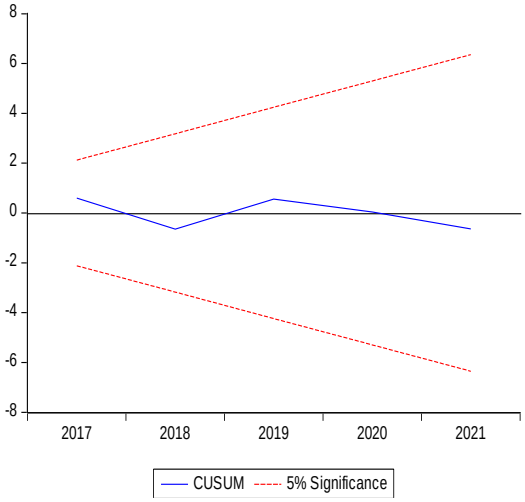

Figure 4.5. CUSUM test plot

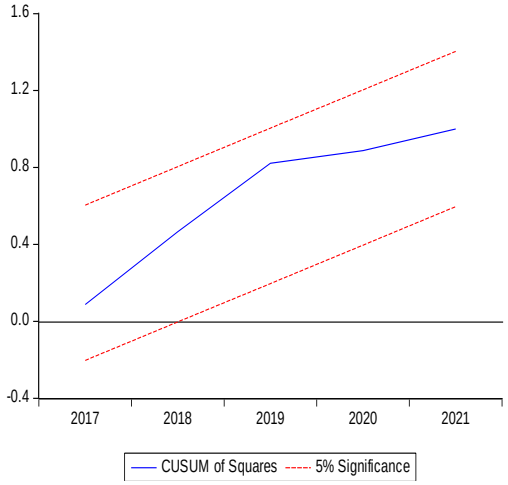

Figure 4.6. CUSUM of squares test plot

CHAPTER FIVE
SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Introduction

This chapter covers the following; summary, conclusions, policy implications and areas of future research.

5.2 Summary of the Findings

This study investigated the asymmetric effects of fiscal policy on output growth and inflation in Kenya, using the non-linear autoregressive distributed lag (NARDL) modelling. The NARDL approach to cointegration and error correction introduces non-linear adjustment into the analysis process. It also helps in determining whether the short-run and long-run effects of fiscal policy are asymmetric. From the findings, there is a long-run cointegrating and equilibrium relationship among the study variables. Evidence from NARDL model showed that previous increase in public debt leads to a rise in the current level of inflation in the short-run. Reduction in public debt increases the level of inflation in both the short-run and long-run. Additionally, the study also found a positive relationship between increase in government spending and inflation in the short-run. This is well defined by an expansionary fiscal policy which result into increased aggregate demand, consumer spending and business investment, leading to inflationary pressures. Decreases in tax revenue on the other hand was found to reduce the level of inflation in the long-run in Kenyan economy.

Regarding output growth, the short-run results showed that reductions in tax revenue have positive and statistically significant effect on economic growth, whereas in the long-run, increases in tax revenue reduce output growth. On the other hand, increases in public debt was linked to a negative short-run effect on output growth. The findings also indicated a persistent negative effect between decreases in government spending and output growth. In the long-run, positive changes in government spending increase output growth while both money supply and trade openness increase the level of output growth.

The Wald test results provided an evidence to support the research hypotheses by confirming a significant difference in the effect of negative and positive changes of government spending and public debt on inflation. In this context, positive effects of government spending and public debt had statically different effects from their negative effects, while tax revenue indicated symmetric effect on inflation. Similarly, the results showed statistical difference in the response of output growth to positive and negative changes of government spending in both the long-run and short-run. Whereas the effects of public debt and tax revenue were found to be symmetric. The models' diagnostic tests showed no serial correlation and heteroskedasticity for either inflation or output growth. In terms of model misspecification, both models were well specified. CUSUM and CUSUM of squares results also indicated stability in both models.

5.3 Conclusions

The effects of fiscal policy on inflation and output growth has continued to attract significant interest in the recent years. However, most of the previous studies have concentrated on the symmetric effects with a few studies appearing to examine the phenomena of asymmetry. Therefore, this study sought to investigate the effect of fiscal policy on inflation and output growth in Kenya using a non-linear approach. The Wald test results provided an evidence to support the research hypotheses by confirming a significant difference in the effect of negative and positive changes of government spending and public debt on inflation as well as asymmetric effect of government spending on output growth.

The study also concluded that reductions in public debt increase inflation in both the short-run and long-run. This indicates that a reduction in public debt might alleviate crowding in effect, thereby allowing increased private investment that may in turn result to increased aggregate demand levels and consequently a rise in inflation. Positive changes in government spending give rise to the level of inflation. This is well defined by an expansionary fiscal policy, which results in increased aggregate demand, consumer spending and business investment, thereby giving rise to higher price levels in short-run. To add on, a negative change in tax revenue as well as interest rate reduces inflation levels in the long-run. Output gap increases inflation in both the short-run and long-run, this

happens when the economy operates above its capacity causing increased demand for goods and services which could in turn push up the level of prices.

The study also concluded that reductions in tax revenue is an efficient tool to stimulate Kenya's economic growth. This result corresponds with Keynes' argument that, implementing tax cuts essentially injects purchasing power into the economy through increasing the disposable income of the citizens. The findings also implied that decreases in government spending reduce economic growth in Kenya, this is due to the reduction in aggregate demand. In the long-run, increases in government spending had a positive effect of output growth, this is as result of increased aggregate demand in the economy. Therefore, expansionary fiscal policy stimulates Kenya's output growth while contractionary fiscal policy reduces output growth. Money supply and trade openness had a positive relationship with output growth.

5.4 Policy Implications

Given the evidence of asymmetries in the study variables; public debt and government spending, the study recommends that asymmetry be incorporated when examining the effects of fiscal policy on macroeconomic variables in order to uncover the underlying non-linear relationships. The study highlights the inflationary effects of rising public debt and increased government spending in the short run, as well as the deflationary impact of reduced tax revenue in the long run. Therefore, fiscal policy should prioritize sustainable debt management to reduce short-run inflationary pressures. This involves aligning public debt levels with the objective of price stability, ensuring that debt-financed expenditures do not disproportionately increase aggregate demand. Additionally, policymakers should consider reforming government spending priorities to focus on productive and non-inflationary investments, while improving tax policy efficiency to enhance revenue collection without placing excessive burden on economic activity.

Additionally, expansionary fiscal policy stimulates Kenya's output growth while contractionary fiscal policy reduces output growth, therefore, increased government spending and tax cuts should be prioritized by the government. However, since such policies were also found to increase the level of inflation, the study recommends that the government should direct expenditures towards productive sectors like the infrastructure

projects. Infrastructure investment attracts investors to the country and support long-term growth without directly adding to inflationary pressures as it boosts productivity, help lower business costs and enhance efficiency in service delivery to accelerate development. The study also recommends on the proper management of government spending to avoid increased public debt and give more attention to economic development blueprints like the Kenya Vision 2030 as it has a long-term impact on the overall economic performance in Kenya. The government should also evaluate the potential effects of its policies to ensure a balanced approach between achieving economic growth while controlling the adverse inflation consequences through coordination with monetary policy.

5.5 Suggestions for Further Research

Given the evidence of long-run asymmetries of public debt and government spending on inflation, it is recommended that future research explores whether disaggregated government spending components, such as recurrent expenditure, capital expenditure and transfer payments also exhibit the same nature of asymmetric effects on inflation and output growth. Additionally, further studies should also be conducted to examine whether domestic debt and external debt display asymmetrical effects similar to total public debt in Kenya. Future studies can also extend to other countries whose economic characteristics are identical to Kenya.

REFERENCES

Abdel-latif, H., & Mishra, T. (2016). Asymmetric growth impact of fiscal policy : A post-shock policy scenario for Egypt. *ERF 22nd Annual Conference Egypt*, 1–17. http://bit.ly/2aOs9W2

Ali, A. A., Ali, A. Y. S., & Dalmar, M. S. (2018). The Impact of Tax Revenues on Economic Growth: a Time Series Evidence From Kenya. *Academic Research International*, *9*(3), 163–170. http://www.savap.org.pk/journals/ARInt./Vol.9(3)/ARInt.2018(9.3-19).pdf

Afonso, A., & Ibraimo, Y. (2018). The Macroeconomic Effects of Public Debt: An Empirical Analysis of Mozambique. Research in Economics and Mathematics (REM) Working Paper 029-2018, Rua Miguel Lúpi 20, 1249–1278. https://www.iese.ac.mz/wp-content/uploads/2018/02/SSRN-id3128469.pdf

Afonso, A., & Sousa, R. M. (2012). The macroeconomic effects of fiscal policy. *Applied Economics*, *44*(34), 4439–4454. https://doi.org/10.1080/00036846.2011.591732

Ahmad, S., Sial, M. H., & Ahmad, N. (2018). Indirect taxes and economic growth: An Empirical Analysis of Pakistan. *Pakistan Journal of Applied Economics*, *28*(1), 65–81. https://www.researchgate.net/publication/325038071

Ahmad, M. J., Sheikh, M. R., & Tariq, K. (2012). Domestic debt and inflationary effects: An evidence from Pakistan. *International Journal of Humanities and Social Science*, *2*(18), 256-263. https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=b7543ad40902ba36f3ddb8449c42ceb24564ca6e

Ahmed, Z. (2021). Revisiting inflation and growth nexus: an asymmetric cointegration based on Non-linear ARDL approach in case of Bangladesh. *Revista Finanzas y Política Económica*, *13*(2), 371–402. https://doi.org/10.14718/revfinanzpolitecon.v13.n2.2021.5

Aimola, A. U., & Odhiambo, N. M. (2021). Public debt and inflation: empirical evidence from Ghana. *Development Studies Research*, *8*(1), 1-13.https://doi.org/10.1080/21665095.2021.1872392

Aimola, A. U., & Odhiambo, N. M. (2022). Is the effect of public debt on inflation symmetric or asymmetric? Evidence from the Gambia. *Croatian Review of Economic,Business and Social Statistics*, *8*(1), 41–57. https://doi.org/10.2478/crebss-2022-0004

Ajaz, T., Nain, M. Z., & Kamaiah, B. (2016). Inflation and openness in India: an asymmetric approach. *Macroeconomics and Finance in Emerging Market Economies*, *9*(2), 190-203. https://doi.org/10.1080/17520843.2016.1162825

Alesina, A., & Ardagna, S. (2010). Large Changes in fiscal policy: Taxes versus spending. *Tax Policy and the Economy*, *24*, 35–68.

https://doi.org/10.1086/649828

Alinaghi, N., & Reed, W. R. (2021). Taxes and economic growth in OECD countries: A meta-analysis. *Public Finance Review*, *49*(1), 3-40. https://doi.org/10.1177/1091142120961775

Alsamara, M. K., Mrabet, Z., Elafif, M., & Gangopadhyay, P. (2017). The asymmetric effects of oil price on economic growth in Turkey and Saudi Arabia: New evidence from nonlinear ARDL approach. *International Journal of Development and Conflict*, *7*(2), 97–118. http://www.ijdc.org.in/uploads/1/7/5/7/17570463/dec_17_art3_v2.pdf

Anyanwu, J. C., & Salami, A. O. (2021). The impact of COVID-19 on African economies: An introduction. *African Development Review*, 1–16. https://doi.org/10.1111/1467-8268.12531

Armantier, O., Koşar, G., Pomerantz, R., Skandalis, D., Smith, K., Topa, G., & Van der Klaauw, W. (2021). How economic crises affect inflation beliefs: Evidence from the Covid-19 pandemic. Journal of Economic Behavior & Organization, *189*, 443-469. doi: 10.1016/j.jebo.2021.04.036

Asandului, M., Lupu, D., Maha, L. G., & Viorică, D. (2021). The asymmetric effects of fiscal policy on inflation and economic activity in post-communist European countries. *Post-Communist Economies*, *33*(7), 899–919. https://doi.org/10.1080/14631377.2020.1867430

Asma, H., & Abdelkader, S. (2021). The effect of fiscal policy on economic growth: The case of Algeria-during the period 1980-2018. *Al-riyada for Business Economics Journal*, *7*(01), 290-300.

Asteriou, D., Pilbeam, K., & Pratiwi, C. E. (2021). Public debt and economic growth: panel data evidence for Asian countries. *Journal of Economics and Finance*, *45*(2), 270–287. https://doi.org/10.1007/s12197-020-09515-7

Atan, J., & Effiong, U. (2021). Fiscal policy and inflation in Nigeria: An insight into the critical limit hypothesis. *Journal of Research in Business and Management*, *9*(5), 66-73.

Attah, J. E., Nenbee, S. G., & Wamkko, J. A. (2022). Tax revenue and the economy of Sub-Saharan Africa: A systemic analysis. *International Journal of Small Business and Entrepreneurship Research*, *10*(1), 1-14.https://tudr.org/id/eprint/125

Aziz, N., & Asadullah, M. N. (2017). Military spending, armed conflict and economic growth in developing countries in the post-Cold War era. Journal of Economic Studies, 44(1), 47-68. https://doi.org/10.1108/JES-01-2015-0021

Bahmani-Oskooee, M., & Arize, A. C. (2020). Asymmetric response of domestic production to exchange rate changes:evidence from Africa. Economic Change

and Restructuring, 53(1), 1–24 . https://doi.org /10.1007/s10644-018-9240-y

Bahmani-Oskooee, M., Huynh, T. L. D., & Nasir, M. A. (2021). On the asymmetric effects of exchange-rate volatility on trade flows: Evidence from US–UK Commodity Trade. *Scottish Journal of Political Economy*, *68*(1), 51–102. https://doi.org/10.1111/sjpe.12257

Ball, L. M., Leigh, D., Mishra, P., & Spilimbergo, A. (2021). *Measuring US Core Inflation: The Stress Test of COVID-19* (No. w29609). National Bureau of Economic Research. DOI 10.3386/w29609 9 http://www.nber.org/papers/w29609

Barlas, A. W. (2020). The Impact of Government Expenditure on Economic Growth in Afghanistan. *Journal of Economics and Business*, *3*(2). https://doi.org/10.31014/aior.1992.03.02.234

Basedau, M., & Deitch, M. (2021). One year after: Has the COVID-19 pandemic increased violence in sub-Saharan Africa? *GIGA Working Papers*. (No. 327).

Baum, A., Checherita-Westphal, C., & Rother, P. (2013). Debt and growth: New evidence for the euro area. *Journal of international money and finance*, *32*, 809-821. https://doi.org/10.1016/j.jimonfin.2012.07.004

Bello, S. A., D. N. Wazamari, S. Z. Stephen, and A. M. Shettima. 2019. "The Examination of theImpact of Fiscal Policy on Economic Performance in Nigeria Between 1981 and 2016."International Journal of Innovative Finance and Economics Research 7 (1): 69–83

Belongia, M. T., & Ireland, P. N. (2015). Interest rates and money in the measurement of monetary policy. Journal of Business & Economic Statistics, 33(2), 255-269. https://doi.org/10.1080/07350015.2014.946132

Benimana, V. (2020) Impact of fiscal policy on economic growth in Rwanda. https://ssrn.com/abstract=3666901

Benin, S., & Odjo, S. (2018). Government Expenditures in Kenya, 1950–2014: Determinants and agricultural growth effects (Vol. 1774). Intl Food Policy Res Inst.

Bhat, J. A., & Sharma, N. K. (2020). Identifying fiscal inflation in India: some recent evidence from an asymmetric approach. *Journal of Economics, Finance and Administrative Science*, *25*(50), 363-393. https://doi.org/10.1108/JEFAS-03-2019-0032

Bildirici, M., & Ersin, O. O. (2007). Domestic debt, inflation and economic crises: a panel cointegration application to emerging and developed economies. *Applied Econometrics and international development*, *7*(1).https://ssrn.com/abstract=1249085

Bussiere, M. (2013). Exchange rate pass-through to trade prices: The role of nonlinearities and asymmetries. *Oxford Bulletin of Economics and*

Statistics, *75*(5), 731-758. doi: 10.1111/j.1468-0084.2012.00711.x

Çakmaklı, C., Demiralp, S., Yeşiltaş, S., & Yıldırım, M. A. (2021). An evaluation of the Turkish economy during COVID-19. *Centre for applied Turkey studies (CATS)| WP NR, 1*. https://www.cats-network.eu/publications/products/arbeitspapiere/CATS__Working_Paper_Nr_1_2021_Cakmakli_Demiralp_Yesiltas_Yildirim.pdf

Chattamvelli, R., & Shanmugam, R. (2023). Kurtosis. In *Descriptive Statistics for Scientists and Engineers: Applications in R* (pp. 111-126). Cham: Springer Nature Switzerland. https://link.springer.com/chapter/10.1007/978-3-031-32330-0_5

Chakraborty, L., & Thomas, E. (2020). Covid-19 and macroeconomic uncertainty: fiscal and monetary policy response. *Economic and political weekly* https://www.nipfp.org.in/publications/working-papers/1899/

Chen, H., Hongo, D. O., Ssali, M. W., Nyaranga, M. S., & Nderitu, C. W. (2020). The asymmetric influence of financial development on economic growth in Kenya: evidence from NARDL. *Sage Open*, *10*(1),2158244019894071.https://doi.org/10.1177/2158244019894071

Chigome, J. (2015). A reflection on sustainability of dollarization in Zimbabwe. *International Journal of Advanced Research*, *3*(7), 306-312.

Choi, W. G., & Devereux, M. B. (2006). Asymmetric effects of government spending: Does the level of real interest rates matter? *IMF Staff Papers*, *53*(SPEC. ISS.), 147–181. https://doi.org/10.5089/9781451860269.001

De Castro, F., & de Cos, P. H. (2008). The economic effects of fiscal policy: the case of Spain. *Journal of Macroeconomics*, *30*(3), 1005-1028. https://doi.org/10.1016/j.jmacro.2007.08.009

de Soyres, F., Santacreu, A. M., & Young, H. L. (2023). Demand-Supply imbalance during the Covid-19 pandemic: the role of fiscal policy. *Federal Reserve Bank of St. Louis REVIEW*. DOI: https://doi.org/10.17016/IFDP.2022.1353

de Haan, J., & Gootjes, B. (2023). What makes discretionary counter-cyclical fiscal policy so difficult? An analysis of 32 OECD countries. *CESifo Economic Studies*, *69*(1), 1-20. https://doi.org/10.1093/cesifo/ifad001

Deskar-Škrbić, M., & Šimović, H. (2017). The effectiveness of fiscal spending in Croatia, Slovenia and Serbia: the role of trade openness and public debt level. *Post-Communist Economies*, *29*(3), 336–358. https://doi.org/10.1080/14631377.2016.1267972

Eberhardt, M., & Presbitero, A. F. (2015). Public debt and growth: Heterogeneity and non-linearity. *Journal of international Economics*, *97*(1), 45-58. https://doi.org/10.1016/j.jinteco.2015.04.005

Egbulonu, K.G., Amadi, K.W., 2016. Impact of fiscal policy on inflation in Nigerian economy. International Journal of Innovative Development & Policy Studies. 4(3), 53-60.

Essien, S. N., Agboegbulem, N., Mba, M. K., & Onumonu, O. G. (2016). An empirical analysis of the macroeconomic impact of public debt in Nigeria. *CBN Journal of applied statistics*, *7*(1), 125-145. http://hdl.handle.net/10419/142116

Ezirim, C. B., Harcourt, P., Muoghalu, M. I., Elike, U., & Alabama, A. (2008). Inflation Versus Public Expenditure Growth in the Us : an Empirical Investigation. *2*(2), 26–40. https://ssrn.com/abstract=1536656

Fakher, H. A. (2016). The empirical relationship between fiscal deficits and inflation (Case study: Selected Asian economies). *Iranian Economic Review*, *20*(4), 551–579.

Falahi, M. A., & Hajamini, M. (2017). Asymmetric behavior of inflation in Iran: new evidence on inflation persistence using a smooth transition model. *Iranian Economic Review*, *21*(1), 101-120.doi 10.22059/IER.2017.60865

Ferrara, L., Metelli, L., Natoli, F., & Siena, D. (2021). Questioning the puzzle: fiscal policy, real exchange rate and inflation. *Journal of International Economics*, *133*, 103524. https://doi.org/10.1016/j.jinteco.2021.103524

Franta, M. (2012). Macroeconomic effects of fiscal policy in the Czech Republic: Evidence based on various identification approaches in a VAR framework. Czech National Bank, Working Paper Series, 13, 2012.

Furceri, D., & Karras, G. (2009). Tax changes and economic growth : Empirical evidence for a panel of OECD countries *. *Manuscript, University of Illionoisnois*, 1–29. https://www.ecb.europa.eu/events/pdf/conferences/ws_pubfinance/paper_Furceri.pdf

Galí, J. (2015). Monetary policy, inflation, and the business cycle: an introduction to the new Keynesian framework and its applications. Princeton University Press.

Georgantopoulos, A. G., & Tsamis, A. D. (2011). The macroeconomic effects of budget deficits in greece: A VAR-VECM approach. *International Research Journal of Finance and Economics*, *79*(May), 156–166. https://ssrn.com/abstract=2063033

Gogas, P., & Pragidis, I. (2015). Are there asymmetries in fiscal policy shocks?. *Journal of Economic Studies*. DOI 10.1108/JES-04-2013-0059

Gordon, R. J. (1990). What is new-Keynesian economics?. *Journal of economic literature*, *28*(3), 1115-1171. https://www.jstor.org/stable/2727103

Gruzina, Y., Firsova, I., & Strielkowski, W. (2021). Dynamics of human capital development in economic development cycles. *Economies*, *9*(2), 1–18. https://doi.org/10.3390/economies9020067

Hallerberg, M., Strauch, R., & von Hagen, J. (2007). The design of fiscal rules and forms of governance in European Union countries. *European Journal of Political Economy*, *23*(2), 338–359. https://doi.org/10.1016/j.ejpoleco.2006.11.005

Hiç, Ö. (2019). Evolution of New Keynesian Economics. *Procedia Computer Science, 158,* 1025-1032. https://doi.org/10.1016/j.procs.2019.09.144.

Hillyer, J. E. R. (2017). Promoting Keynesian liberalism*: Walter W. Heller and US economic policy, 1933-1987* (Doctoral dissertation, UCL (University College London)). https://discovery.ucl.ac.uk/id/eprint/10028602

Jackson, E. A., & Jabbie, M. (2020). Understanding market failure in the developing country context. In *Decent Work and Economic Growth* (pp. 1095-1105). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-319-95867-5_44

Jha, S., Mallick, S., Park, D., & Quising, P. (2014). Effectiveness of countercyclical fiscal policy: Evidence from developing Asia. *Journal of Macroeconomics*, *40*, 82–98. https://doi.org/10.1016/j.jmacro.2014.02.006

Jałtuszyk, G. (2022), Inflation, Global Financial Crisis, and COVID-19 Pandemic. *Available at SSRN 4186354* (2022): https://ssrn.com/abstract=4186354 or http://dx.doi.org/10.2139/ssrn.4186354

Jørgensen, P. L., & Ravn, S. H. (2022). The inflation response to government spending shocks: A fiscal price puzzle?. *European Economic Review*, *141*, 103982.https://doi.org/10.1016/j.euroecorev.2021.103982

Kairanya, K. A. (2016). Impact of Taxation on Economic Growth in Kenya (1975-2014) (Doctoral dissertation, University of Nairobi). http://hdl.handle.net/11295/100025

Kansiime, M. K., Tambo, J. A., Mugambi, I., Bundi, M., Kara, A., & Owuor, C. (2021). COVID-19 implications on household income and food security in Kenya and Uganda: Findings from a rapid assessment. *World Development*, *137*, 105199. https://doi.org/10.1016/j.worlddev.2020.105199

Karakaplan, M. U. (2009). The conditional effects of external debt on inflation. *Sosyal Ekonomik Araştırmalar Dergisi*, *9*(17), 203-217. https://dergipark.org.tr/en/pub/susead/issue/28418/302586

Kenya National Bureau of Statistics. (2022). Economic survey 2022. Kenya National Bureau of Statistics. https://www.knbs.or.ke

Kerubo, J. (2023). Analysis of kenya's progress toward a knowledge based society. *Journal of Education and Practices ISSN 2617-5444 (ONLINE) & ISSN 2617-6874 (PRINT)*, *3*(3), 27-44. http://journals.essrak.org/index.php/education/article/view/241

Kim, J., Wang, M., Park, D., & Petalcorin, C. C. (2021). Fiscal policy and economic

growth: some evidence from China. *Review of World Economics*, *157*(3), 555-582. https://link.springer.com/article/10.1007/s10290-021-00414-5

Khan, A., Khan, N., & Shafiq, M. (2021). The Economic Impact of COVID-19 from a Global perspective. *Contemporary Economics 15*(1), 64-76. https://link.gale.com/apps/doc/A653470027/AONE?u=anon~3f3cb540&sid=googleScholar&xid=67fade30

Kiriga, B., & Chemnyongoi, H. (2020). Optimization of Public Debt and its Impact on Kenya's Economic Growth. Kenya Institute for Public Policy Research and Analysis. 34. https://repository.kippra.or.ke/bitstream/handle/123456789/3059/DP245.pdf?sequence=1&isAllowed=y

Korkmaz, S., & Güvenoğlu, H. (2021). The Relationship Between Government Expenditures, Economic Growth and Inflation in Oecd Countries. *Finans Ekonomi ve Sosyal Araştırmalar Dergisi*, *October*. https://doi.org/10.29106/fesa.982512

Kumar, M., & Woo, J. (2010). Public debt and growth. https://ssrn.com/abstract=1653188

Lotfi, S., Izmailov, P., Benton, G., Goldblum, M., & Wilson, A. G. (2022). Bayesian Model Selection, the Marginal Likelihood, and Generalization. http://arxiv.org/abs/2202.11678

Lopes da Veiga, J. A., Ferreira-Lopes, A., & Sequeira, T. N. (2016). Public Debt, Economic Growth and Inflation in A frican Economies. *South African Journal of Economics*, *84*(2), 294-322. https://doi.org/10.1111/saje.12104

M'Amanja, D., & Morrissey, O. (2015). Fiscal aggregates, aid and growth in Kenya. *Nottingham: University of Nottingham.* https://www.researchgate.net/publication/228384120

Mba, P. N., Yuni, D. N., & Oburota, C. S. (2013). Analysis of domestic debt: Implication for economic growth in Nigeria. *Global Journal of Social Sciences*, *12*(1), 1-9. https://www.ajol.info/index.php/gjss/article/view/111505

Magazzino, C. (2011). The nexus between public expenditure and inflation in the Mediterranean countries. *Theoretical and Practical Research in Economic Fields (TPREF)*, *2*(03), 94-107. https://www.ceeol.com/search/article-detail?id=261354

Maingi, J. N. (2010). The impact of government expenditure on economic growth (1963-2008). Unpublished Ph. d thesis). Kenyatta University, Nairobi, Kenya. https://irlibrary.ku.ac.ke/bitstream/handle/123456789/576/James%20N.%20Maingi.

Maingi, J. N. (2017). *T*he Impact of Government Expenditure on Economic Growth in Kenya : *1963-2008*. *5*(12), 635–662. https://doi.org/10.13189/aeb.2017.051201

Makau, J., Njuru, S., & Ocharo, K. N. (2018). Fiscal policy and public debt in Kenya. http://www.repository.embuni.ac.ke/handle/123456789/2067

Makin, A. J., & Layton, A. (2021). The global fiscal response to COVID-19: Risks and repercussions. Economic Analysis and Policy, 69, 340-349. https://doi.org/10.1016/j.eap.2020.12.016

Mathu, M., Osoro, N., & Luvanda, E. (2018). An Empirical Analysis of the Effects of Fiscal Deficit on Inflation Kenya. *Journal of Economics and Sustainable Development*, *9*, 20.

Minea, A., & Villieu, P. (2009). Threshold effects in monetary and fiscal policies in a growth model: Assessing the importance of the financial system. *Journal of Macroeconomics*, *31*(2), 304-319. https://doi.org/10.1016/j.jmacro.2008.10.005

Mose, N., Thomi, J., Fumey, M., & Ewusi Arthur, D. (2024). An Empirical Analysis of Public Debt Sustainability in Kenya. *Asian Journal of Economics, Business and Accounting*, *24*(9), 10-9734. 10.9734/ajeba/2024/v24i91497

Mou, J. (2020). Research on the Impact of COVID19 on Global Economy. In *IOP Conference Series: Earth and Environmental Science* (Vol. 546, No. 3, p. 032043). IOP Publishing. DOI 10.1088/1755-1315/546/3/032043

Muguro, J. W. (2017). Effect of public expenditure on economic growth in Kenya: *1963 2015* (Doctoral dissertation, Kca University).

Mutuku, C. (2015). Assessing fiscal policy cyclicality and sustainability: A fiscal reaction function for Kenya. Journal of Economics Library, 2(3), 173-191. DOI: http://dx.doi.org/10.1453/jel.v2i3.410

Musgrave,R. (1959). Theory of fiscal policy. New York: McGraw Hill

Narayan, P. K., & Smyth, R. (2006). What determines migration flows from low-income to high-income countries? An empirical investigation of Fiji–Us migration 1972–2001. *Contemporary economic policy*, *24*(2), 332-342. **https://doi.org/10.1093/cep/byj019**

Ndonga, I. K. (2014). Effects of Government Spending on Economic Growth in Kenya (Doctoral dissertation, University of Nairobi).

Nguyen, V. B. (2015). Effects of fiscal deficit and money M2 supply on inflation: Evidence from selected economies of Asia. *Journal of Economics, Finance and Administrative Science*, *20*(38), 49–53. https://doi.org/10.1016/j.jefas.2015.01.002

Nguyen, T. D. (2019). Impact of government spending on inflation in Asian emerging economies: Evidence from India, China, and Indonesia. *The Singapore Economic Review*, *64*(05), 1171-1200. https://doi.org/10.1142/S0217590816500338

Nguyen, H. T., & Darsono, S. N. A. C. (2022). The impacts of tax revenue and investment on the economic growth in Southeast Asian countries. *Journal of*

Accounting and Investment, *23*(1), 128-146. DOI: 10.18196/jai.v23i1.13270

Nuru, N. Y., & Gereziher, H. Y. (2022). The effect of fiscal policy on economic growth in South Africa: a nonlinear ARDL model analysis. *Journal of Economic and Administrative Sciences*, *38*(2), 229–245. https://doi.org/10.1108/jeas-06-2020-0088

Nyenyia, N. D., Amlegab, E. L., & Scholasticac, O. (2017). The Relationship between inflation and economic growth in East African Community countries. *Institutionalrepository* https://repository.maseno.ac.ke/handle/123456789/4720

Obaretin, O., & Akhor, S. O. (2019). Taxation and inflation in Nigeria: An empirical analysis. *Research Journal of Finance and Accounting*, *10*(4), 91-98. DOI: 10.7176/RJFA/10-4-11

Oboh, J. O., Chinonyelum, O. J., & Edeme, R. K. (2018). Tax revenue and economic growth in selected ECOWAS countries, evidence from sure model. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *8*(3), 310-324. (DOI: 10.6007/IJARAFMS/v8-i3/4917

Olaoye, O. O., Tabash, M. I., Omokanmi, O. J., Ogunjumo, R. A., Ojelade, M. O., & Ishola, J. A. (2022). Macroeconomic implications of escalating stock of public debt: Evidence from sub-Saharan African economies. *African Development Review*, *34*(4), 527-540. **https://doi.org/10.1111/1467-8268.12677**

Otto, G., & Ukpere, W. I. (2015). The impact of fiscal policy on inflation in Nigeria. *Risk governance & control: financial markets & institutions*, *5*(1), 123-132. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Otto+and+Ukpere+%282015%29%2C+&btnG=

Olayungbo, D. O. (2013). Government Spending and Inflation in Nigeria: An Asymmetry Causality Test. *International Journal of Humanities and Management Sciences*, *1*(4), 238–242

Oyerinde, A. A. (2019). An assessment of the nexus between government expenditure and inflation in Nigeria. *Folia Oeconomica Stetinensia*, *19*(2), 102-116. https://www.ceeol.com/search/article-detail?id=891342

Palley, T. I. (2013). Keynesian, classical and new Keynesian approaches to fiscal policy: Comparison and critique. *Review of Political Economy*, *25*(2), 179-204. https://doi.org/10.1080/09538259.2013.775821

Pegkas, P. (2020). The impact of renewable and non-renewable energy consumption on economic growth: the case of Greece. *International Journal of Sustainable Energy*, *39*(4), 380–395. https://doi.org/10.1080/14786451.2019.1700261

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, *16*(3), 289–326. https://doi.org/10.1002/jae.616

Poku, K., Opoku, E., & Agyeiwaa Ennin, P. (2022). The influence of government

expenditure on economic growth in Ghana: An Ardl approach. *Cogent Economics & Finance*, *10*(1), 2160036. https://doi.org/10.1080/23322039.2022.2160036

Ramey, V. (2009). Ten Years after the financial crisis: What have we learned from the renaissance in fiscal research? *Journal of Economic Perspectives*, *33*(2), 89–114. https://doi.org/10.1257/jep.33.2.89

Ramey, V. A. (2011). Can government purchases stimulate the economy ? *Journal of Economic Literature*, *49*(3), 673–685. DOI: 10.1257/jel.49.3.673

Rebelo, S. (1991). Long-Run Policy Analysis and Long-Run Growth. *99*(3), 500–521. http://dx.doi.org/10.1086/261764

Rahman, M., & Islam, A. (2020). Some dynamic macroeconomic perspectives for India's economic growth: Applications of linear ARDL bounds testing for co-integration and VECM. *Journal of Financial Economic Policy*, *12*(4), 641-658. https://doi.org/10.1108/JFEP-11-2018-0165

Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a Time of Debt. *American economic review*, *100*(2), 573-578. DOI: 10.1257/aer.100.2.573

Rehman, A., Cismas, L. M., & Milin, I. A. (2022). "The Three Evils": Inflation, Poverty and Unemployment's Shadow on Economic Progress—A Novel Exploration from the Asymmetric Technique. *Sustainability (Switzerland)*, *14*(14). https://doi.org/10.3390/su14148642

Roberts, J. M. (1995). New Keynesian economics and the Phillips curve. *Journal of money, credit and banking*, *27*(4), 975-984. https://doi.org/10.2307/2077783

Romero, J. P. B., & Marín, K. L. (2017). Inflation and public debt. *Monetaria*, *5*(1), 39-94.

Romer, P. M. (1986). Increasing Returns and Long-Run Growth. *Journal of Political Economy*, *94*(5), 1002–1037. https://doi.org/10.1086/261420

Saez, E. (2017). Taxing the rich more: Preliminary evidence from the 2013 tax increase. *Tax Policy and the Economy*, *31*(1), 71–120. https://doi.org/10.1086/691084

Samson, B., Peter, F., & Cynthia, D. (2023). Fiscal Policy and Inflation in Nigeria. *Journal of Sustainable Business and Economics*, *6*(2). DOI: http://dx.doi.org/10.26549/jsbe.v6i2.15889

Saungweme, T., & Odhiambo, N. M. (2021). Inflation and economic growth in Kenya: An empirical examination. Advances in Decision Sciences, 25(3), 1-25.

Shevchuk, V., & Kopych, R. (2018). Assessing fiscal sustainability in Ukraine: TVP and VAR/VEC approaches. *Entrepreneurial Business and Economics Review*, *6*(3), 73–87. https://doi.org/10.15678/EBER.2018.060305

Shin, Y., Yu, B., & Greenwood-Nimmo, M. (2012). Modelling Asymmetric Cointegration and Dynamic Multipliers in a Nonlinear ARDL Framework. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.1807745

Springler, E. (2019). Inflation: Failures of Inflation Targeting—A European Perspective. *Frontiers of Heterodox Macroeconomics*, 173-221. https://doi.org/10.1007/978-3-030-23929-9_5

Sriyana, J., & Ge, J. J. (2019). Asymmetric responses of fiscal policy to the inflation rate in Indonesia. *Economics Bulletin*, *39*(3), 1701-1713.

Surjaningsih, N., Utari, G. A. D., & Trisnanto, B. (2012). The Impact of Fiscal Policy on the Output and Inflation. *Buletin Ekonomi Moneter Dan Perbankan*, *14*(4), 367–396. https://doi.org/10.21098/bemp.v14i4.409

Stock, J. H., & Watson, M. W. (2007). Why has US inflation become harder to forecast?. *Journal of Money, Credit and banking*, *39*, 3-33. https://doi.org/10.1111/j.1538-4616.2007.00014.x

Tahir, M., Rehman, Z., & Javed, F. (2022). Asymmetric effects of inflation instability and GDP growth volatility onenvironmental quality in the USA. Human Nature Journal of Social Sciences, 3(1), 31–43. https://hnpublisher.com/ojs/index.php/HNJSS/article/view/273

Tenai, A. K. (2020). Effect Of Government Expenditure On Selected Sectoral Output Performance In Kenya (Doctoral Dissertation, Kenyatta University). https://ir-library.ku.ac.ke/server/api/core/bitstreams/d93f8086-c101-456e-b960-fc93b24719ac/content

Tenaw, D., & Demeke, H. (2020). Inflation Threshold Effects on Growth in Ethiopia : Evidence from Food and Non-food Sectors. *African Development Bank, December*. https://doi.org/10.20944/preprints202012.0301.v1

Tendengu, S., Kapingura, F. M., & Tsegaye, A. (2022). Fiscal Policy and Economic Growth in South Africa. *Economies*, *10*(9). https://doi.org/10.3390/economies10090204

Tsaurai, K. (2021). Tax Revenue and Economic Growth in Emerging Markets: Is Financial Development Relevant? Array. *The Journal of Accounting and Management*, *11*(1). Retrieved from https://www.dj.univ-danubius.ro/index.php/JAM/article/view/498

Tsuchiya, Y. (2016). Assessing macroeconomic forecasts for Japan under an asymmetric loss function. *International Journal of Forecasting*, *32*(2), 233–242. https://doi.org/10.1016/j.ijforecast.2015.05.005

Udoh, I. E., & Kokoette, I. U. (2023). Fiscal Policy and Inflation in Nigeria. *Asian Journal of Economics, Business and Accounting*, *23*(22), 96-108. https://doi.org/10.9734/ajeba/2023/v23i221139

Ugwuanyi, U. B., & Ugwunta, O. D. (2017). Fiscal policy and economic growth: An examination of selected countries in Sub-Saharan Africa. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *7*(1), 117-130. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Ugwuanyi+and+Ugwunta+2017+&btnG=

Walakira, G. (2021). Impact of COVID-19 on Light Manufacturing in the East African Community. http://publication.aercafricalibrary.org/handle/123456789/2885

Wanjiku, M. R. (2013). Does Composition of Public Expenditure affect Economic growth ? Evidence from Kenya. October. http://erepository.uonbi.ac.ke/bitstream/handle/11295/60451/

Yoong, F. T., Latip, A. R. A., Sanusi, N. A., & Kusairi, S. (2020). Public debt and economic growth nexus in Malaysia: An ARDL approach. *The Journal of Asian Finance, Economics and Business*, *7*(11), 137-145. DOI:10.13106/jafeb.2020.vol7.no11.137

Yusuf, A., & Mohd, S. (2021). Asymmetric impact of fiscal policy variables on economic growth in Nigeria. *Journal of Sustainable Finance and Investment*, *0*(0), 1–22. https://doi.org/10.1080/20430795.2021.1927388

Yusuf, A., & Mohd, S. (2021). The impact of government debt on economic growth in Nigeria.*Cogent Economics &Finance, 9(1),* 1946249.https://doi.org/10.1080/23322039.2021.1946249

Yusuf, A., & Mohd, S. (2023). Investigating the Asymmetric Impact of Public Debt on Economic Growth in Nigeria. *Journal of the Knowledge Economy*, 1-30. https://link.springer.com/article/10.1007/s13132-023-01362-1

Zivot, E., & Andrews, D. W. K. (2002). Further evidence on the great crash, the oil-price shock, and the unit-root hypothesis. *Journal of Business & Economic Statistics*, *20*(1), 25-44. https://doi.org/10.1198/073500102753410372

Zeng, Q., & Yue, X. (2022). Re-evaluating the asymmetric economic policy uncertainty, conventional energy, and renewable energy consumption nexus for BRICS. *Environmental Science and Pollution Research*, *29*(14), 20347–20356. https://doi.org/10.1007/s11356-021-17133-x

Zhang, W. (2022). China's government spending and global inflation dynamics: The role of the oil price channel. *Energy Economics*, *110*, 105993. https://doi.org/10.1016/j.eneco.2022.105993

Zeyneloglu, I., & Koenig, G. (2017). Recent economic developments and the implications for fiscal policy in open economy macroeconomics. *Revue d'Economie Politique, 126*(6), 1023–1056. https://doi.org/10.3917/redp.266.1023