

**THE EFFECT OF GOVERNMENT EXPENDITURE ON ECONOMIC GROWTH
IN KENYA**

**BY
ANN N. MPAINEI**

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MANAGEMENT SCIENCES, UNIVERSITY OF NAIROBI**

NOVEMBER, 2022

DECLARATION

I the undersigned, declare that this is my original work and has not been submitted to any university for academic credit.

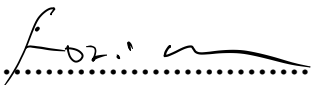
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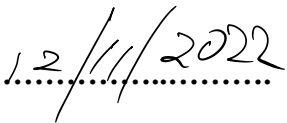
Date.....11.11.2022.....

Ann N. Mpainei

D61/86042/2016

This research proposal has been presented for examination with our approval as the appointed supervisors

Signed..........


Date..........

Dr. Dominic Murage

Lecturer

Department of Finance and Accounting

University of Nairobi

Signed..........

Date..........

Prof. Mirie Mwangi

Co-Supervisor

Department of Finance and Accounting, University of Nairobi

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Nobody has been more important to me in pursuing this project than my family members. I want to thank my parents for their love and guidance in whatever I do. They are the ideal role models. But, most importantly, I would like to thank my classmates, who were always encouraging and supportive.

DEDICATION

My thesis is dedicated to my family and many friends. I give special thanks to my loving parents, whose words of encouragement and push for tenacity still ring in my ears. My siblings were always there for me when I needed them after a long day of studying and researching. Most importantly I dedicate this work to my son Adriel, you been my biggest supporter. Words may not be sufficient to express how grateful I am!

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TABLE OF CONTENTS

DECLARATION..... ii

ACKNOWLEDGMENT iii

DEDICATION..... iv

LIST OF TABLES viii

LIST OF FIGURES ix

LIST OF ACRONYMS AND ABBREVIATIONS x

ABSTRACT..... xi

CHAPTER ONE: INTRODUCTION 1

1.1 Background of the Study 1

 1.1.1 Government Expenditure 2

 1.1.2 Economic Growth 3

 1.1.3 Government Expenditure and Economic Growth 4

 1.1.4 Government Expenditure and Economic Growth in Kenya..... 5

1.2 Research Problem 6

1.3 Research Objectives 8

1.4 Value of the Study 8

CHAPTER TWO: LITERATURE REVIEW..... 10

2.1 Introduction..... 10

2.2 Theoretical Review 10

 2.2.1 Wagner’s Theory..... 10

 2.2.2 Keynesian Theory 11

 2.2.3 Peacock and Wiseman’s Theory 12

 2.2.4 Musgrave Theory of Public Expenditure 13

2.3 Determinants of Economic Growth 14

 2.3.1 Inflation..... 14

 2.3.2 Exchange Rates 15

2.4 Empirical Studies 15

 2.4.1 Global..... 15

2.4.2 Local Studies.....	17
2.5 Conceptual Model.....	17
CHAPTER THREE: RESEARCH METHOD	20
3.1 Introduction.....	20
3.2 Research Design.....	20
3.3 Population	20
3.4 Case Study	20
3.5 Data Collection	21
3.6 Diagnostic Test	21
3.5.1 Multicollinearity Test.....	21
3.5.2 Autocorrelation	22
3.5.3 Homoscedasticity	22
3.5.4 Normality	22
3.6.5 Significance Test.....	23
3.6 Operationalization of variables	23
3.7 Models.....	24
CHAPTER FOUR: FINDINGS, PRESENTATION AND DATA ANALYSIS	25
4.1 Introduction.....	25
4.2 Descriptive Statistics.....	25
4.3 Time series Analysis of Data	26
4.4 Diagnostic Test and Results.....	28
4.4.1 Multicollinearity Test.....	28
4.4.2 Autocorrelation	29
4.4.3 Homoscedasticity	29
4.4.4 Normality	31
4.5 Variable Relationships	32
4.6 Regression Analysis: GDP, Government Expenditure, Inflation and Exchange Rates, Relationships.....	34

4.7 Multiple Regression Analysis	34
4.7.1 Analysis of Variance.....	35
4.8 Discussions of Findings	36
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION	39
5.1 Introduction.....	39
5.2 Summary of Findings.....	39
5.3 Conclusion	40
5.4 Recommendation	42
5.5 Limitations	43
5.5 Suggestions for Further Studies	43
REFERENCES.....	45
APPENDICES	51
Appendix I: Data Collection Form	51

LIST OF TABLES

Table 1: Operationalization of Variables	24
Table 2: summarizes time series variables used in the study.....	25
Table 4: Autocorrelation test results	29
Table 5: Normality test.....	31
Table 6: The Shapiro-Wilk test.....	32
Table 7: Correlation matrix	33
Table 8: Analysis of variance.....	35

LIST OF FIGURES

Figure. 1 Conceptual Model.....	19
Figure 2: Time series Analysis of Data	26
Figure 3: Time Series Data	27
Figure 4: regression scatter plot.....	30

LIST OF ACRONYMS AND ABBREVIATIONS

CPI	Consumer Price Index
EU	European Union
GDP	Gross Domestic Product
GNP	Gross National Product
ROI	Return on Investment
SPSS	Statistical Package for Social Science
TWI	Trade-weighted index
VIF	Variance Inflation Factor
WGI	World Governance Index

ABSTRACT

The study looked at how government spending affected Kenya's economic expansion. Government spending served as the study's independent variable, while economic growth served as the study's dependent variable. Exchange rates and inflation were the control variables. The study was based on the Keynesian theory as well as the theories of Peacock and Wiseman, Wagner, and Musgrave's Theory of Public Expenditure. The significance of the outcome under other conditions was utilized to test casualty. Secondary data sources from KNBS, CBK publications, and the World Bank provided the information for the entire study. Various diagnostic tests (multicollinearity autocorrelation, Homoscedasticity, and normality) were performed to ensure that the study did not violate the panel. Government spending served as the study's independent variable, while economic growth served as the study's dependent variable. Exchange rates and inflation were the control variables. The study was based on the Keynesian theory as well as the theories of Peacock and Wiseman, Wagner, and Musgrave's Theory of Public Expenditure. In the study, a causal research design was employed. The significance outcome under other conditions was used to test casualty. Secondary data sources from KNBS, CBK publications, and the World Bank provided the information for the entire study. Various diagnostic tests (multicollinearity autocorrelation, Homoscedasticity, and normality) were performed to ensure that the study did not violate the panel.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Economic expansion is crucial metric for asserting the important welfare of a country. A growth in an economy suggests an increase in real GDP. In essence it refers to increasing income, total output and total expenditure (Fatemi & Behmanesh, 2012). Researcher arguments on the relationship between governmental spending and economic growth are numerous. These discourses have led to the presentation of a variety of conceptual evidence in the economic literature, and it is still far from conclusive. Common ground from diverse studies portrays that government expenditure influences the performance of an economy; however, the direction of influence varies with time and the specified country (Bandrés, & Gadea 2019). Alexiou and Nellis (2017) remarks that under short term and long-term dynamics, public spending impacts economic growth measurement positively regardless of the inflation scale.

The study is supported by Keynesian theory, Peacock and Wiseman's theory, Wagner's theory, and the Musgrave Theory of Public Expenditure. According to Keynes' theory, a country's money market is subsequently impacted by an increase in government expenditure, creating demand for money and causing interest rates to rise, weakening private investment (Ventelou & Nowell, 2015). As per Wagner's theory, the government grows in response to growth in the general economy and society. The significant flaw in Wagner's theory is that it only relies on the demand side to explain government expenditure. Musgrave theory of public expenditure provides that the initial levels of development demand public capital for installation of major infrastructures and other

installation demands (Uzuner, Bekun, & Akadiri, 2017). From this perspective public expenditure will reduce towards the end of a project and increase when the government introduces a new development. Wiseman and Peacock's theory postulate that government expenditure does not rise in an even and ceaseless manner, but in pace (Lonik 1998). From these connotations society and community demands creates necessity for public expenditure to increase to an extent that available sources of funds may deem inefficient (Magazzino, Giolli, & Mele, 2015).

In Kenya there is evident increase in government expenditure since independence without conclusive outcome on the economy for the same (Odero & Reeves, 2014). According to Otieno (2016), expenditure on education positively effected economic growth. Otieno (2016) focused on labor force education and concluded that an increase of education per workforce by 1% improved the work output by 5%. Gisore, *et al*, (2014) asserted that health and defense expenditure impact on the economic growth positively; while education and agriculture spending yielded insignificant effects in the short run. According to Maingi (2017), despite government expenditures increasing, economic growth in Kenya has been inconsistent.

1.1.1 Government Expenditure

Government Expenditure is an outflow made by the central government, regional, and local authorities making up a substantial portion of GNP (Cvetanovic, Filipovic, Nikolic, & Belović, 2015). Ribeiro and Lima (2019) refer to government expenditure as the expenses incurred by a government for the maintenance of itself, society, economy, and assisting other nations. All economies depend on public spending since it determines the size and rate of economic expansion of the economy.

As a result, expenditure boosts aggregate output, which is especially beneficial for developing countries plagued by massive market failures and poverty (Chilarescu & Viasu, 2013). Alternatively, it could lead to unintended consequences such as inflation (Alexiou, 2009). Public spending is an important tool for stimulating the various social, economic, and legal requirements for economic development.

Government expenditure is an output that can be measured in scales (Jackson, 1990). Government expenditure is a monetary unit that the research will access from authentic publications. Okoth (2021) measured government expenditure through summation of the amount spent on defense services and development services. Weil (2013) accounts for administrative services, debt services, assistance to the States, and cost of maintaining the military. The general indicators of government expenditure include government deficit, general government debt, government and spending by destination (Magazzino, Giolli, & Mele, 2015) the research reviewed all the expenses in periodic intervals of years. The current study accommodates total government expenditure.

1.1.2 Economic Growth

The definition of economic growth is an increase in GDP from one duration to another (Weil, 2013). Economic growth, according to Palmer (2012), is an increase in a country's ability to generate more goods and services. It also increases productivity per head of population over a given time period (Seater & Yenokyan, 2019). Economic growth is characterized as a rise in real GDP, GDP per capita, or national output evaluated in constant prices, according to Weil (2013). Capital goods and technology increases contribute to economic growth (Jackson, 1990). The common assumption from all the definitions is that an economy is doing well when their production of goods and services is increasing. This

assertion is important because it denotes enhanced living standards and increased consumption of goods and services. Any measure that will help the government know that the citizens' lives are improved denotes the importance of a holy grail.

Lisi and Pugno (2015) Measured economic growth through GDP. Ventelou and Nowell (2015) also measured economic growth through GDP and GNP. Manyeki and Kotosz (2017) also measured economic growth as percentage change in GDP between two different periods. The current study will rely on GDP as an indicator of growth in comparison to two different time periods.

1.1.3 Government Expenditure and Economic Growth

Public spending is critical to the operation of all economies because it determines the size of the economy and its growth. Keynes believes that the government must be involved in the economy to regulate activities and maintain the quality of citizens' income through inflation management (Lisi & Pugno, 2015). Different researchers agree that government spending influences economic performance; however, the direction of influence varies over time (Gisore et al., 2014).

While the majority of discussions claim that government spending has an impact on economic growth, some contend that economic growth is what makes government spending possible. Wagner's theory holds that government expands in response to an increase in the general economy and society (Udo & Effiong, 2014). In this sense, the variables continue to correlate from a demand standpoint. Government spending on productive areas of the economy, such as infrastructure development, road construction, and power, attract private investment due to increased profit opportunities, promoting

economic growth. According to some economists, increased government spending will eventually lead to economic stagnation (Nkoro & Uko, 2016).

With government spending, there would be more development in infrastructure and other vital aspects of the economy relating to human capital development. Correlation studies have revealed that public spending positively influences economic growth to an optimal level where no changes are possible. According to Endogenous Growth Theory, appropriate government spending leads to economic growth (Lisi & Pugno, 2015). Such an idea is significant because it will aid the study in estimating the optimal value for public expenditure above, which may result in fund misappropriation.

1.1.4 Government Expenditure and Economic Growth in Kenya

An aggregate expenditure is reflective of current value of finished goods and services (Odero & Reeves, 2014). Government expenditure is the sum of expenses by the national government on final goods and services. This expense includes civil servants' salaries, cost incurred in servicing the military, other government consumption and expenses on investment by the government (Weil, 2013).

Economic growth studies can either be studied in long run or short run periods. In the short run economic growth is a factor of business cycles. These cycles are characterized by rising and falling in productions that occur over months and years. These changes are caused by fluctuation in aggregate demands in the stages of expansion, boom, recession and depression. Growth in real GDP is measured as a percentage change over time. The population is used to determine economic growth. While an increase in GDP owing to

population expansion constitutes enormous growth, an increasing per capita income reflects intensive growth. GDP is a gauge of economic expansion.

Studies on how government expenditure affects economic growth in Kenya do exist, but those that encompass potential futures still need to be investigated. In Kenya, there has been little research on government spending and economic growth, with the main topics being inflation and exchange rates.

1.2 Research Problem

All government spending on goods and services, excluding transfers between government accounts, is government expenditure. Government spending contributes significantly to economic growth by increasing demand for goods, services, and production. Conversely, reduced government expenditure can lead to decreased demand and output. The two concepts are related because government expenditure can help to increase economic growth. For example, if the government spends money on developing new infrastructure, this can increase the number of goods and services that can be produced and thus increase economic growth.

Kenya's government expenditure has been growing in recent years, and this has been accompanied by economic growth. The two are linked, and the government's spending is likely contributing to the country's expanding economy. With more money being funneled into public projects and services, there is more activity and productivity, which in turn drives up economic growth. This virtuous cycle is benefiting Kenya and its people and is likely to continue doing so in the future. What is the impact of introducing exchange rates

and inflation as a consideration measurement of government expenditure on economic performance in Kenya?

Uzuner, Bekun, and Akadiri (2017) used the Johansen Cointegration method in Turkey to determine an intermediate correlation amid government expenditure and economic performance concerning Wegner's theory. The study discovered that GDP and government spending are stochastically related. This research was conducted in an economy heavily reliant on natural resources (oil), as opposed to Kenya's economy. In the USA, Dudzevičiūtė, Šimelytė, & Liučvaitienė (2018) concluded that in some instances, minimized government spending would improve economic development while other circumstances demand increased financing. This study focused on developed countries with different economic settings as Kenya. In regards to the EU nations, Magazzino, Giolli, & Mele, (2015) studied long and short-term association amid federal expenditure and fiscal progress. Long-term analysis revealed that the relationship was not stable and weakened over long durations (Magazzino, Giolli, & Mele, 2015). While the study has an important factor of time, its geographical setting makes it unrealistic to adopt in African nations. The study's findings have no bearing on inflation, another critical factor in Kenya's economy. Given the considerable bearing on corruption the researcher enquires; what is the optimal level of expenditure in Kenya that will reduce cases of corruption? Will reduction on Government expenditure reduce corruption cases?

The empirical effects of government expenditure on East African economic progress from 1980 to 2010 were examined by Gisore et al. in 2014. The region comprises three countries which are Kenya, Uganda, and Tanzania. Manyeki and Kotosz (2017) concluded that Musgrave theory suits Kenyan scenario given the long term and short term effect. From

2012, changes have occurred Kenyan economy that may create an altercation to their initial findings. In this scenario it is important to enquire; what sectors yield positive results in Kenyan government expenditure responding positively to economic performance?

More study is required to determine the link amid inflation and exchange rates, as well as government spending and economic growth. Recent studies have found that government expenditure can boost the economy. Nonetheless, it is still unclear how currency rates and inflation affect this correlation. Further research is needed to investigate whether inflation and exchange rates can moderate the relationship between government spending and economic growth.

1.3 Research Objectives

To determine the effect of government expenditure on economic growth in Kenya

1.4 Value of the Study

There is no clear consensus among theories about how government spending affects economic expansion. Further studies on the topic are essential because it helps economists understand how different aspects of the economy interact. For example, if government spending leads to inflation, policymakers must be aware of this when making fiscal policy decisions. Additionally, if government spending positively affects economic growth, this could be used to stimulate the economy. Economic theories will benefit from research on the connection between government spending and economic growth since it will shed light on how governmental decisions might affect the economy. Additionally, this research can help economic theories better predict how the economy will respond to changes in government spending.

For politicians to effectively allocate government resources, they must have a detailed understanding of the connection between government spending and economic growth. Additionally, this research can help identify areas where government expenditure may negatively impact economic growth and help inform decisions about whether or not to continue with specific policies.

As per the contribution of the debate the study will test the accuracy of the four economic theories in the Kenyan context for the past 55 years. This study would be beneficial to policy makers as it looks at the level of expenditure and economic changes to determine the optimal value for expenditure policies in Kenya. Stakeholders in expenditure policy development may rely on the findings of this study to optimize expenditure policies with respect to exchange rates and inflation. In practice the study will offer findings to the government as the major stakeholder will offer conclusions on what it ought to consider in their expenditure policies to contribute to growth of the nation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section entails literature review on relationship between government spending on growth of the economy. Subsection 2.2 covers the theoretical reviews of the studies. In the section, Wagner and Keynes's hypothesis are expounded, and instances are illustrated. Subunit 2.4 involves the empirical overview of the studies. The paragraph comprises previous studies of different countries by various scholars

2.2 Theoretical Review

Theories explain how and why events occur as they do. The research employs Keynesian theory, Peacock and Wiseman's theory, Wagner's theory, and Musgrave Theory of Public Expenditure to underpin the study.

2.2.1 Wagner's Theory

Wagner (1835–1917) revealed the positive correlation between economic growth and government size. Wagner's theory is based on the experience of the initial phases of development in Europe (Adil, Ganaie, & Kamaiah, 2017). The theory contends that government spending is determined by economic growth. The results imply that economic growth dictates government expenditure (Udo & Effiong, 2014). An important contribution from the theory provides that public expenditure of today was a revenue from economic developments.

Furthermore the theory also points that governments respond to the demands of the citizens especially when they constantly collect tax. Proponents supporting Wagner's theory argue

that the implication of theory makes sense in the long run because the government will rely on past investment to finance its future expenditures (Babatunde, 2018). The significant flaw in Wagner's theory is that it only relies on the demand side to explain government expenditure (Magazzino, Giolli, & Mele, 2015). Critics of this theory also posit that it is difficult to tell whether Wagner's expenditure is proportion of the government spending or total expenditure that depends on the economic growth.

Despite its detractors, this theory is crucial to the research that focuses on the implications of public spending and economic growth for both the long and short terms. (Magazzino, Giolli, & Mele, 2015). This notion will be important to underpin the progress of economic performance as a factor of past expenditure.

2.2.2 Keynesian Theory

British economist John Maynard Keynes (1963) formulated the method of Keynesian published in his book "The General Theory of Employment, Interest, and Money," which he wrote during the Great Depression (Soylu & Çakmak, 2018). Keynesian theory implies that the government can improve the country's economy when it is lagging by reducing its expenditure, and the spending is exogenous. It's important to mention this theory is contentious to Wagner's theory. The Keynesian philosophy argues that there is increased expenditure and employment when there is government technological intervention (Udo & Effiong, 2014).

However, some researchers differ with the reasoning behind the Keynesian theory as the scholars argue that many instances show that lower tax rates have resulted in enhancing the country's economic progress (Chipaumire, Hlanganipai, Method, & Ruswa, 2014).

However, Babatunde (2018) affirms that the politicians and journalists are popular with the Keynesian approach to enhance the economy as they advocate the essence to invest more resources in boosting economic growth. One country that employs the Keynesian theory is the United Arab Emirates. The government has spurred economic development in Dubai through levy discounts to attract investors who will develop foreign direct investments.

Albeit the critics, Keynesian theory will provide an important input in testing instances of economic growth when the government regulates its expenditure. The researcher will observe changes in GDP in instances where government expenditure goes down to affirm or disagree with the theory in Kenya's perspective for the last 55 years. The contributions of Keynes will be crucial in figuring out the short-term effects of reduced public spending.

2.2.3 Peacock and Wiseman's Theory

The theory was propounded in 1890-1955 by Wiseman and Peacock in their work on public spending in United Kingdom (Lonik 1998). Theorists postulate that government expenditure does not rise in an even and ceaseless manner, but in pace. Besides the point Peacock and Wiseman exclaim that society and community demands creates necessity for public expenditure to increase to an extent that available sources of funds may deem inefficient (Lonik 1998 as cited by (Magazzino, Giolli, & Mele, 2015).

Other than such demanding scenarios Peacock and Wiseman suggest that there is no sufficient warranty for expanding government expenditure. Major critics of the theory exclaim that the hypothesis is solely dependent on the occurrence and recurrence of abnormal conditions to create public expenditure upsurge. In essence the theorist assumed

that events like increasing population structural changes and systematic expansion of public activities also call for increasing public expenditure.

The theory will still be useful in determining how public expenditure in Kenya has changed during instances of abnormal scenarios such as the election and reelection cases, introduction of subsidized education, among other pressures that have significantly led to rise in public expenditure. This theory is also important to the studies because it provides an important notion of why the public expenditure improved. In the end of the study the researcher will be in a position to tell why the public expenditure rose and how it affected economic growth.

2.2.4 Musgrave Theory of Public Expenditure

During the development period (1969), Musgrave observed that public institutions changed their roles (Uzuner, Bekun, & Akadiri, 2017). The theory provides that the initial levels of development demand public capital for installation of major infrastructures and other installation demands. Musgrave adds that later stages of development advances and demands little capital which eventually calls for reduction of expenditure on the same project (Manyeki & Kotosz, 2017). From this perspective public expenditure will reduce towards the end of a project and increase when the government introduces a new development.

The major limitation of this theory is it predicts public expenditure based on phases of development which may not be practical. It is unlikely that the theory can predict the behavior of public expenditure in its later stages (Babatunde, 2018). It is not feasible how

to point the initial phase of development in an economy though for an ever growing economy the phases may be distributed in terms of ages.

Despite the inadequacies of the theory the researcher still finds it useful in testing the behavior of public expenditures in essential projects such as water service. The study will be keen to test Musgrave theory on capital projects that influence government expenditure and how they numerically behave in Kenya from initial phases to later phases where applicable. Given that the study will rely on historical facts, the researcher will test the plausibility of Musgrave contribution from independence stage to attenuate increase in expenditure through the periods from independence and observe the outcome.

2.3 Determinants of Economic Growth

An increase in GDP is the definition of economic growth. There must be a reference point for comparison to authenticate whether the economy is growing. All definitions share the assumption that an economy is doing well when the production of goods and services increases. Economic growth is essential because it indicates increased living standards and consumption of goods and services. A holy grail is any measure that helps the government know that the lives of its citizens are better.

2.3.1 Inflation

The increase in prices of goods and services is measured by inflation. It is an important metric because it factors in the real value of goods in relation to time. Government expenditure may increase in value compared to one period and another which interfere with the real value of goods (Lisi & Pugno, 2015). By measuring the CPI index, the researcher will take into account how inflation affects government spending and economic expansion.

2.3.2 Exchange Rates

Exchange rates take the relative value of a country's currency to other currencies into account. At the analysis stage the researcher considered exchange rates to compare Kenyan shilling with US Dollars (USD) (Bilateral exchange rates) (Ventelou & Nowell, 2015). To offer a standard measurement for exchange rates the study relied on the Trade-weighted index (TWI) of Kenya shilling from 1963 to 2018 from the World Bank database.

2.4 Empirical Studies

This section reviews literature relevant to the study. It begins with global studies and ends with contributions from local studies.

2.4.1 Global

In the USA, a study by Dudzevičiūtė, Šimelytė, & Liučvaitienė (2018) showed that federal expenditure at national level has varied impact on economic progress. This study focused on developed countries with different economic settings as Kenya. The study will not be a sufficient textbook when testing hypotheses in developing countries with substantial debts. This study also lacks the time as a factor of measuring development.

In regards to the EU nations, studies of long and short-term association amid federal expenditure and economic progress were done by Magazzino, Giolli, & Mele (2015). The long-term analysis revealed that the relationship was not stable and weakened over long durations. While the study has an important factor of time, its geographical setting may be inapplicable in African nations given the different variables driving economic development in the different environs.

Uzuner, Bekun, and Akadiri (2017) used the Johansen Cointegration method in Turkey to determine an intermediate relationship between government spending and economic performance concerning Wegner's theory. According to the analysis, there is a probabilistic relationship between GDP and government spending. This study was carried out in an economy that relies heavily on natural resources (oil), a factor that speaks differently to Kenya's economy. The result of these studies also have no bearing on inflation which is another important factor that would be relevant in Kenya's scenery.

A study by Chipaumire, Hlanganipai, Method, & Ruswa (2014) aimed to ascertain application of Keynes's hypothesis regarding the significance of the government to the economic prosperity of South Africa. The study was inconclusive on long run implication the theory in South Africa. The study is close notation to Kenya compared to other international studies but still may not mirror Kenyan scenario accurately because of the difference of economic composition of the nations. The study also factors inflation and economic stability as important control variables.

Research on Nigeria from 1980 to 2008 focused on sectoral spending. Udo and Effiong (2014) state that increment in government expenditure in the past has not transformed the country positively, and for this reason, Nigeria is ranked among the most impoverished nations globally. While the study was concerned with expenditure it omits inflation exchange rate which could overstate the real value of goods sold. The study also focused on a twenty year period in Nigeria which may not reflect on the fifty-five year studies of Kenya.

2.4.2 Local Studies

Using data from 1980 to 2010, Gisore et al. (2014) claimed to have conducted a study to ascertain the empirical effect of government spending on East African economic growth. The study's findings show that expenditure on health and defense has a favorable effect on economic expansion. Spending on agriculture and education, on the other hand, had less of an effect. The study did not take into account inflation and currency rates' long- and short-term effects as significant denominators.

Manyeki and Kotosz (2017) analyzed the link between Public expenditures and economic performance while focusing on Kenya Data from 1967-2012. The study concluded that Musgrave theory suits Kenyan scenario given the long term and short term effect. Since 2012 different changes have occurred starting with devolution and increased public debts that may create an altercation to Manyeki and Kotosz (2017) findings.

Kiminyei (2019) investigated the link amid government debts and spending. He found out that an increase in government leads to increased public debts while an increase in taxation reduces public debt. The study was only limited to the period between 1960 and 2011. Besides, the study failed to factor the effect of inflation or exchange assessing economic performance.

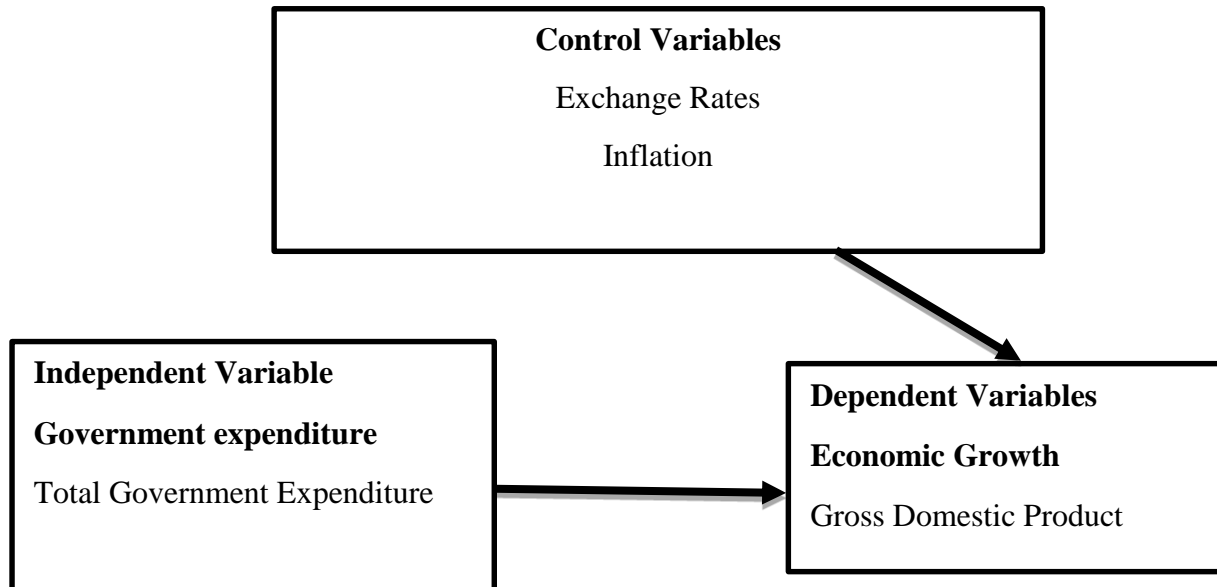
2.5 Conceptual Model

A conceptual model is a diagram that shows how different variables are related. The link amid independent and dependent variables is discussed in this section. Government expenditure is the study's independent variable, and income activity is the study's dependent variable. Control variables were inflation and exchange rates.

Government expenditure is a monetary unit that the research will access from authentic publications. The research will review all the expenses in periodic intervals of years. The study will be keen to assess whether an increase in government expenditure in one period led to significant economic growth in the same period. The researcher will measure this metric with the total government expenditure. The government spends a sum amount of money which is subject to inflation across different periods. Consideration of inflation is important in the study because it provides the time value of money (Lisi & Pugno, 2015).

Economic growth is realized when the economic scenario in different periods is measured. GDP is an important measure of growth that concentrates on the final product (Gisore *et al.*, 2014). Real GDP accounts for sales made domestically and externally, the measure is preferable because it accounts for effects of inflation. GDP is unlimited as it does not account for unpaid services and black market activities which also generate income to participants. Figure 1 shows how the variables relate to one another.

Figure. 1 Conceptual Model



CHAPTER THREE

RESEARCH METHOD

3.1 Introduction

The methodology, research design, and data analysis are all defined in this chapter. This section also explains how the study ensured viability and credibility of the data to maintain the integrity of the study.

3.2 Research Design

In the study, a causal research design was employed. This approach is used by researchers to look at the contingent hypotheses phenomena, which presupposes a link between two variables (Abenavoli et al., 2021). This approach was taken in order to assess how government spending affected economic expansion. Causality can be determined by observing the factors that are thought to cause various aspects; in this study, the casualty was tested by determining the significance of the outcome under different conditions.

3.3 Population

The study concentrated on Kenya's overall economic development.. The study concentrated on all the three main sectors of the economy namely the Agriculture, Industry, and services.

3.4 Case Study

The study was carried out in Kenya with focus on events that occurred between 1963 and 2018.

3.5 Data Collection

Secondary sources of data from authentic publications from KNBS and CBK publications formed the source of information for the entire study. Yearly data for the variables in the study from 1963 – 2018 were collected from these sources.

3.6 Diagnostic Test

Diagnostic tests were vital in verifying nature of data used in the study besides assuring the consistency, accuracy, efficiency and unbiased regression analysis results. The researcher carried our test to ensure that the study does not violate panel error and assumption that interferes with normality. The test was checked on multicollinearity autocorrelation, Homoscedasticity, and normality

3.5.1 Multicollinearity Test

Multicollinearity represents a scenario where more than one variable highly correlates in multiple regression model. If there's Multicollinearity issue then it means that any minor change to input data lead to large change in model even manipulating changes in the estimated parameters for measuring economic growth (Alin, 2010). The researcher expects redundant information from the raw SPSS data set which the study was tested using variance inflation factor (VIF) and tolerance detection. A tolerance of less than 0.1 is an indication of Multicollinearity issue. Similar VIF of 5 and above worked as an indicator Multicollinearity issue (Alin, 2010). If that was the issue the researcher dropped one of the variables to produce significant coefficients in the model. Another remedy for the existence of multicollinearity entailed gathering more data where possible.

3.5.2 Autocorrelation

The analysis has elements of the time series pattern that linear regression alone may not capture. The study evaluated the impact of government spending across a 55-year period. Autocorrelation is a correlation between a provided series (economic growth) and its past values over the provided period. Economic development will be measured in lags (Liu, Tong & Liu, 2014). The first lag measures correlation in a span of one year and the second lag (long term) will test the correlation in the long term more than a year up to the 55 years of assessment (Alin, 2010) . In Kenya over the past 55 years, this statistic has determined the short- and long-term correlations between governmental spending and economic growth.

3.5.3 Homoscedasticity

Homoscedasticity occurs in a regression model when all the random variables exhibit a similar finite variable (Wilcox, 2007). The assumption at work was that for every input in government expenditure the variance exhibits similar characteristics along the regression line. The study performed a homoscedasticity test using Koenker–Bassett test on the public expenditure as the independent variable. From an auxiliary regression model, the test retains the square of R which becomes the test statistic for Chi-Square when multiplied by the sample size (Liu, Tong & Liu, 2014).

3.5.4 Normality

This test is useful in determining whether each dependent variable is approximately distributed normally for each category of the independent variable. For the purposes of this study, each component of the economic expansion measurement must have a value for

government spending that is regularly distributed. The study maintains this requirement by observing the skewness and kurtosis Z- values that should range within ± 1.96 . The test also determined whether the Shapiro p-value was higher than 0.05. (Valaris, 2016).

3.6.5 Significance Test

T-test

T-test is a hypothesis test statistic used to find p-value that determines acceptance or rejection of the null hypothesis (Kelejian & Piras, 2015). The researcher relied on T-test to assess the data set from different sets of financial years in Kenya's economies. The tests would help in ascertaining if the population mean were the same or different the financial years of the study.

3.6 Operationalization of variables

The operationalization of variables relates to variables, indicators and metrics of measuring variables in the study. Table 1 represents a summary of how the study will administer each variable. The study collected data from 1963 to 2018 from the database of the KNBS. The study examined quarterly data and annual data to take into account both the long-term and short-term consequences of government spending. Long-term effect accounts for the results of more than one year period. In the end, the study will show the summative effect of public expenditure for 55 years in Kenya.

Variable	Indicator	Other studies	Measurement
Government Expenditure	Total Government Expenditure	Alexiou, & Nellis, (2017)	Amount in Kenyan shs
Economic Growth	GDP	Chipaumire et al.,2014	Growth as %
Inflation	Price of goods and services	Alexiou, 2009	Consumer Price Index CPI
Exchange Rates	Bilateral exchange rates	Ventelou & Nowell, 2015	Trade-weighted index (TWI)

Table 1: Operationalization of Variables

3.7 Models

The study used a simple regression model to test the correlation amid dependent and independent model under influence of the determinants in the form of:

$$Y = \alpha + X_1 + \beta X_2 + \beta X_3 + E$$

Where: Y= Economic growth (GDP)

α = A constant

β = gradient

X₁= Total Government expenditure

X₂= Inflation measures in absolute factor (CPI)

X₃= Exchange rate measured in absolute factor (TWI)

E = Error term in the regression model

CHAPTER FOUR

FINDINGS, PRESENTATION AND DATA ANALYSIS

4.1 Introduction

The section offers secondary research findings that were confirmed by referring to additional secondary data sources. From the World Bank database, information on government spending, inflation, currency exchange rates, and gross domestic product was taken. The researcher also verified accuracy of these numbers by checking them against data obtained in Kenya National Bureau of Statistics (KNBS) publications and against statistics available at Statista (online statistics portal).

4.2 Descriptive Statistics

Table 2: Summarizes time series variables used in the study.

Statistics				
	Government expenditure in Billions (KSH)	GDP in Billions (KSH)	CPI	Bilateral exchange rates (TWI)
Mean	374.697	3362.542	10.4869	41.8408
Median	268.323	3172.455	9.3295	25.2113
Std. Deviation	0.272.	2.038.	8.29794	34.53891
Minimum	41.244	696.336	-.17	7.00
Maximum	1088.333	8327.604	45.98	103.41

For all the variables under consideration in table 2, the mean tends to drift away from the median. This indicates that the average values tend to be far from the center of each individual series. The mean remains well above the median, indicating a significant shift in values as time progresses from 1963–2018.

4.3 Time Series Analysis of Data

Time series analysis is the process of investigating variables in a series and determining how they integrate with one another. One method of time series analysis is graphical analysis, which shows the behavior of variables in a straightforward manner. Figure 2 displays the variables in the estimable model graphically.

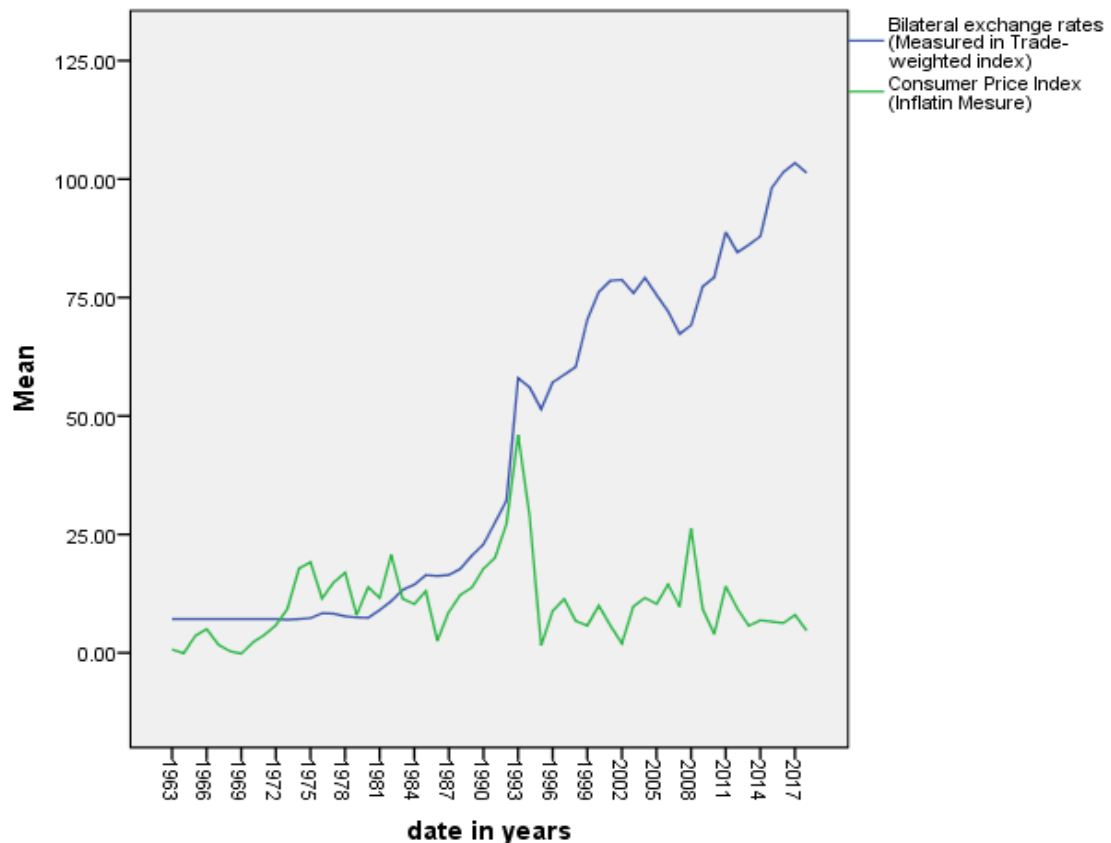


Figure 2: Time Series Analysis of Data

From the time series, we can see that Kenya’s currency has been steadily declining against the US dollar from 1981 to 2008. Additionally, we see fluctuations in Kenya’s consumer price index between 1993 and 1996. From this, it is possible to conclude that the currency is expected to continue losing value over time while inflation rates should level out at an average of 7%.

The time series for GDP and Government expenditure are displayed in figure 3 below

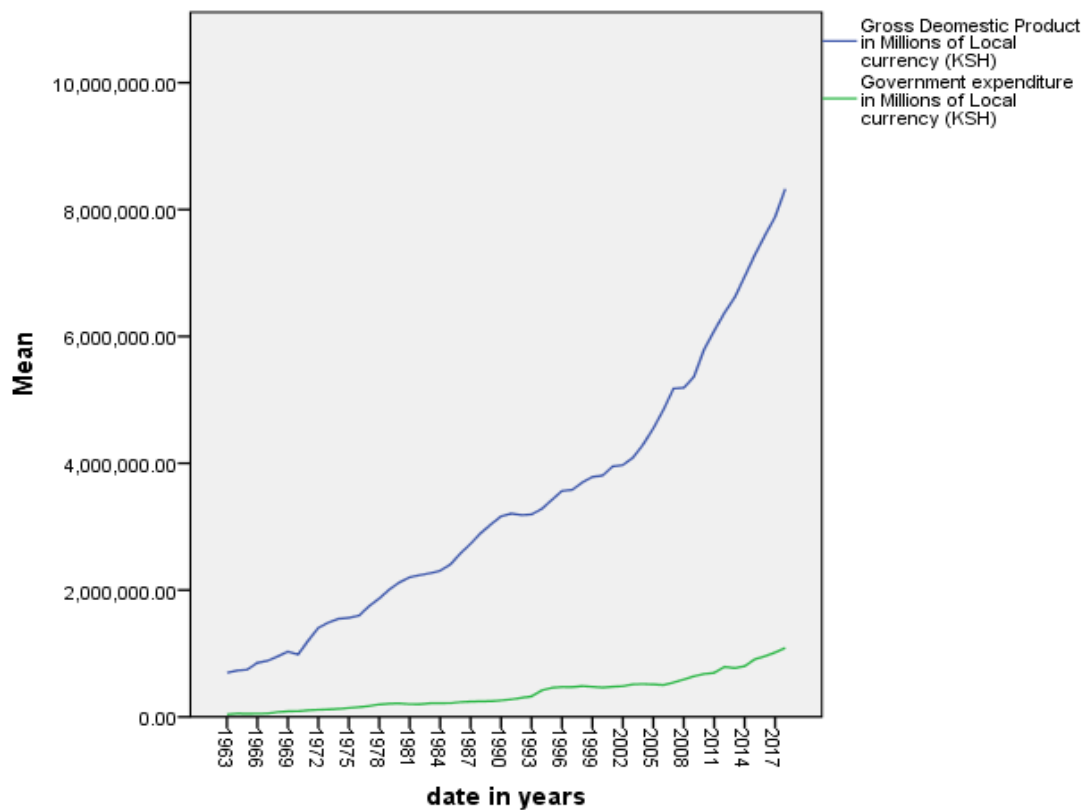


Figure 3: Time Series Data

The total amount of government spending and the size of the government both decreased in 1996–1997 as a result of the sharp decline in GDP. Musyoki (2010) had similar findings

and attributed the changes to the uncertainty surrounding multiparty elections that year and a loss of donor confidence that resulted in the suspension of most financial aid.

4.4 Diagnostic Test and Results

4.4.1 Multicollinearity Test

The collinearity statistics from the test are displayed on table 3.

Coefficients								
Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	Collinearity Statistics		
	B	Std. Error	Beta			Tolerance	VIF	
(Constant)	429.82	84.38		5.09	.000			
Expend.	0.007	.004	1.07	17.86	.000	.10	9.69	
CPI	13.41	4.72	.055	2.84	.006	.99	1.01	
WTI	4745.22 ⁻	3520.61	-.080	-1.35	.18	.10	9.69	

a. Dependent Variable: Gross Domestic Product

Table 3: collinearity statistics

With focus on tolerance and variance inflation; if there's Multicollinearity issue then it means that any minor change to input data will lead to large change in model even

manipulating changes in the estimated parameters for measuring economic growth (Alin, 2010). A tolerance of less than 0.1 is an indication of Multicollinearity issue. A similar VIF of 10 is also an indicator Multicollinearity issue (Alin, 2010). Given that none of the test scores indicate Multicollinearity issue none of the variables was removed.

4.4.2 Autocorrelation

Autocorrelation test results from SPSS are in table 4

Model Summary						
Model	R	R Square	Adjusted R Square		Std. Error of the Estimate	Durbin-Watson
1	.966 ^a	.933	.932		531.44	.049

a. Predictors: (Constant), date in years

b. Dependent Variable: Gross Domestic Product

Table 4: Autocorrelation test results

The analysis from the table has elements of a time series pattern of effect of government expenditure of 55 years. Autocorrelation is a correlation between a provided series (economic growth) and its past values over the provided period. Economic development will be measured in lags (Liu, Tong & Liu, 2014). From the results, Darbin Watson results is less than 2 which indicates affirmative correlation amid economic growth and time series.

4.4.3 Homoscedasticity

The Koenker-Bassett test on the government spending was used as the independent variable in a homoscedasticity test. From an auxiliary regression model, the test retains the

square of R which becomes the test statistic for Chi-Square when multiplied by the sample size (Liu, Tong & Liu, 2014). From figure 4 the residual values are equally distributed.

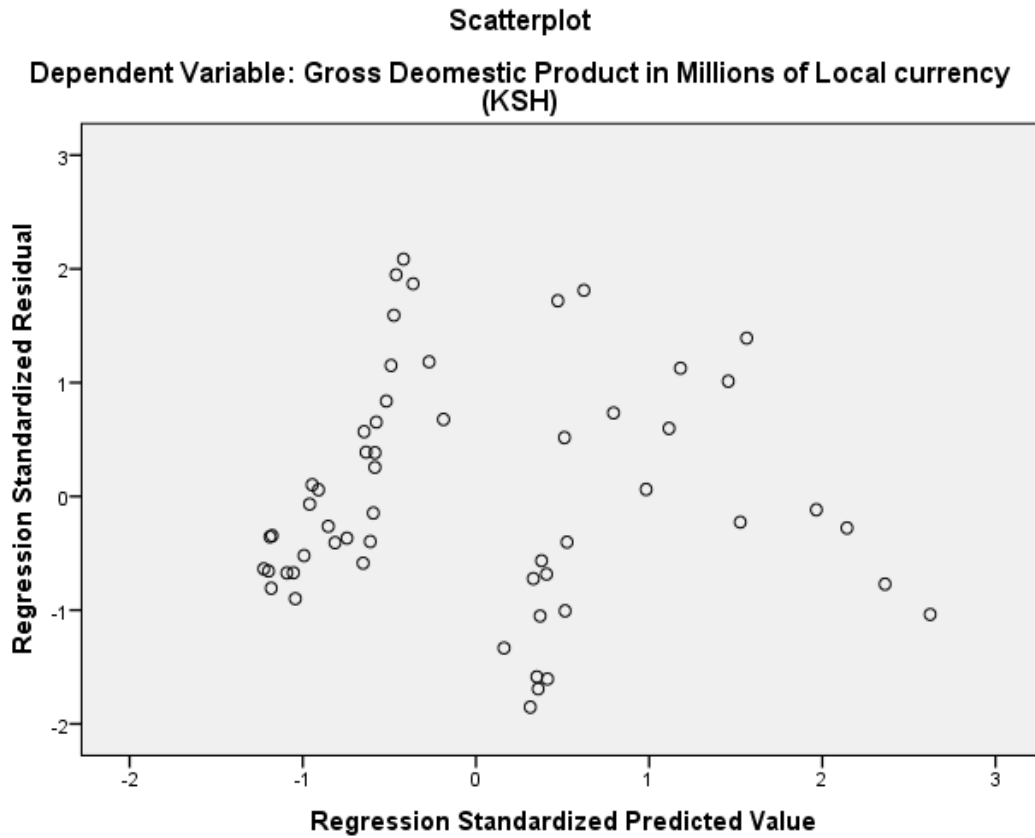


Figure 4: Regression Scatter Plot

4.4.4 Normality

The normality test results for GDP and Government expenditure are displayed in table

Descriptives			
		Statistic	Std. Error
GDP	Mean	3362.54	0.27
	5% Trimmed Mean	3253.81	
	Skewness	.741	.394
	Kurtosis	-.234	.628
Expenditure	Mean	374.70	36.36
	5% Trimmed Mean	356.76	
	Skewness	.851	.319
	Kurtosis	-.013	.628

Table 5: Normality test

Focusing on skewness and kurtosis; the GDP skewness measure was 0.741 with standard error of 0.349. The Z-score value in this case ($0.741 / 0.394$) is 2.12 which is away from normality range of -1.96 to +1.96. Kurtosis test zed score for GDP is also -0.37 (within the normality range). For government expenditure, the Z-score for skewness is 2.67, and 0.37 for kurtosis. The data for government expenditure and Gross domestic product is not

skewed but kurtotic; in this case differ significantly from normality. The Shapiro wilk test results are displayed in table 6

Tests of Normality						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
GDP	.097	56	.200*	.932	56	.003
Expenditure	.162	56	.001	.911	56	.001

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Table 6: The Shapiro-Wilk test

P-values less than 0.05 for the Shapiro-Wilk test for government spending and GDP data in Kenya from 1963 to 2018 indicate that the datasets are not regularly dispersed.

4.5 Variable Relationships

The aim of this research was to find out if government spending has an impact on gross domestic product by establishing the correlation between the variables. A Pearson test was used to examine the temporal linkages between GDP, inflation, and government expenditure. The results are summarized in the table 7.

N=56		Correlations			
		Expenditure	GDP	CPI	WTI
Expenditure	Pearson Correlation	1			
	Sig. (2-tailed)		.000	.933	.000
GDP	Pearson Correlation	.989	1		
	Sig. (2-tailed)	.000		.763	.000
CPI	Pearson Correlation	-.011	.041	1	
	Sig. (2-tailed)	.933	.763		.916
WTI	Pearson Correlation	.947	.929	.014	1
	Sig. (2-tailed)	.000	.000	.916	

Correlation is significant at the 0.01 level (2-tailed).

Table 7: Correlation matrix

The results of the correlation between government spending and GDP gave a two-tailed correlation of 0.989, indicating a strong positive correlation. The correlation's significance value is less than 0.05. The resulting conclusion is that the two variables have a meaningful relationship. The results also showed the bidirectional causality. In other words, models to support both the Keynesian and Wagnerian hypotheses. The evidence points more towards GDP influencing the government expenditure from the data; it is also an indication that

government expenditure influences GDP. It's reasonable to assume that the level of Gross Domestic Product (GDP)—or national income—may have an impact on how much the government spends. And while the results may not be conclusive, a position is reasonable that is in line both Keynesian principles and Wagner's law.

4.6 Regression Analysis: GDP, Government Expenditure, Inflation and Exchange Rates, Relationships

First, regression analysis was adopted to see if linear correlation amid independent and dependent variables. Except for inflation, all relationships had a strong positive correlation. Another study examined the relationship between government spending, inflation, and exchange rates.

4.7 Multiple Regression Analysis

Multiple linear regression results revealed a very strong collective significant effect between expenditure, inflation, exchange rates, and GDP. From the results CPI and government expenditure r was -0.011 with a significance of 0.933 . This indicates a weak negative correlation with no statistical significance. CPI and GDP correlation coefficients were 0.041 with significance of 0.763 another indication of weak positive correlation with no statistical significance. The exchange rates and Government expenditure coefficients were 0.947 with significance below 0.05 . This indicates a strong positive correlation with statistical significance. A strong positive correlation amid exchange rates and GDP with constant of 0.929 with less than 0.05 significance. There could be a correlation between the variables.

ANOVA table

4.7.1 Analysis of Variance

The variation across different components of the data was calculated using a one-way ANOVA. The following are the degrees of variation, squares, average squares, F- and P-values:

Analysis of Variance Results					
Groups	N	Mean	Std. Dev.	Std. Error	
Expenditure	56	374.7	272.08	0.36	
GDP	56	3362.54	2038.22	0.27	

ANOVA Summary					
Source	DF	Sum of Square	Mean Square	F Statistic	P-value
Regression (between \hat{y}_i and \bar{y})	2	223973098100	111986549000	1314.24	0
Residual (between y_i and \hat{y}_i)	53	4516123588	85209879.14		
Total (between y_i and \bar{y})	55	228489221700	4154349485		

Table 8: Analysis of variance

Coefficient Table Iteration 1 (adjusted R-squared)

	Coeff	SE	t-stat	Lower	upper	Stand Coeff	p-value	VIF
B	429823.34	84382.42	5.09	260497.61	599149.07	0	0.000	
X1	7.98	0.44	17.85	7.084	8.87	1.06	1.110	9.69
X2	13417.980	4722.34	2.84	3941.91	22894.05	0.05	0.006	1.00
X3	-4745.185	3520.59	-1.34	-11809.77	2319.40	-0.08	0.183	9.69

Coefficient Table Iteration 2 (adjusted R-squared)

	Coeff	SE	t-stat	lower	upper	Stand Coeff	p-value	VIF
b	450256.02	83646.61	5.38	282482.17	618029.88	0	0.000	
X1	7.41	0.14	51.22	7.12	7.70	0.98	0	1.00
X2	12918.50	4743.91	2.72	3403.42	22433.58	0.05	0.008	1.00

$R^2 = 0.980$ is the square of R . This indicates that 98% of the variance in Y is explained by the predictors (X_i). R square after adjustment is 0.97. The multiple correlation coefficient (R) is 0.990. It indicates that there is a strong correlation amid the projected data and the actual data (\hat{y}).

$$\hat{Y} = 450256.0274 + 7.410834 X_1 + 12918.50204 X_2$$

4.8 Discussions of Findings

The study found that all of the variables have an impact on GDP, both individually and in combination. The findings that government spending positively impacts GDP growth are consistent with the findings of Fiona (2010). She discovered that government spending is increasingly resulting in increased GDP growth. This is most likely due to government spending on public goods and services that benefit the economy as a whole. This finding coincides with Ram (1986) who also found that government spending can result in increased productive investments, which in turn contribute to economic growth. Sakamoto (2020) also found that Government Expenditure on social investments boosted GDP. Sakamoto (2020) finds that government investment on family support and education are all favorably correlated with GDP growth after analyzing data from 17 industrialized countries.

Additionally, the data support Landau (1983) and Thuo (2013)'s assertions that there is a linear link amid government spending and economic growth and that GDP varies only slightly as a result of changes in spending. Despite the fact that Najafabadi and Aremesh Al-Saadi (2021) reached the same finding in Iraq, their study also stressed that government spending had a favorable impact on economic growth when the spending was directed toward investing activities. Contrary to many studies Haini and Wei Loon (2021) only

noted that Government expenditure was positively correlated to GDP only in left wing government and negatively correlated to GDP in right wing governments.

According to the findings, exchange rates positively impact economic growth. WTI and GDP growth levels were discovered to have a positive relationship. The Kenyan economy improves as the value of the US dollar rises against the shilling. Although there is a negative but not statistically significant correlation amid inflation and economic growth. These results are in line with those of Carrera and Vergara (2012) and Couch (2012), who maintain that the path of a sustainable fiscal policy can be significantly changed by a local currency depreciation. Amayo and Urhoghide (2011) also carried a comparative study between Sub-Saharan Africa and Asian countries economy and concluded that exchange rates had direct correlation with GDP. Hanjani et al. (2022) tested a correlation between GDP and exchange rates with inclusion of COVID-19 effects and found that that COVID but exchange rates positively affect on Real Estate Investor Market and GDP.

The results of the three multiple regression models show that, with the exception of inflation, factors affecting government spending and the currency rate have an effect on economic growth. Only inflation has a detrimental impact on economic expansion. This outcome, though, lacked statistical significance. In Malaysia, Hamidah et al. (2021) discovered that exchange rates and inflation have a detrimental effect on economic growth. Banerjee et al., (2005) arrived at the same conclusion but stressed that inputs factors and not inflation itself had effect on economic growth. Banerjee et al. (2005) inputs could explain why the correlation between inflation and GDP was insignificant. However, these results on the correlation amid inflation and GDP diverge from those of economists Landau

(1983) and Thuo (2013), who both discovered a positive and negative correlation amid inflation and economic growth.

The current account, currency rate, and government spending all had a big impact on economic expansion. Although the difference is small, the combined variables improve the relationships. The statistical relevance of inflation as a forecast of economic growth, for instance, was nonexistent. The regression equation for GDP at various levels of inflation, currency rates, and government expenditure demonstrates that while the combined variables increased the correlations, the difference is negligible. Results point to a relationship between government spending and economic expansion. Economic growth rates are generally greater during periods of higher government expenditure. There are several possible explanations for this relationship. One is that government spending created economic growth conditions by investing in infrastructure and human capital. Another is that government spending stimulates demand in the economy, leading to higher levels of output and growth. If government spending is not well-targeted, it can lead to waste and inefficient allocation of resources.

High levels of federal expenditure can also result in increased debt and deficit levels, which can be detrimental to long-term economic growth. Even after accounting for inflation and exchange rates, the data point to a favorable association between government spending and economic growth. While there are potential risks to excessive government spending, the evidence suggests that government spending can be an essential economic driver.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

The study concludes with findings and policy recommendations in this chapter. There is a section at the end for further investigation into proposed areas.

5.2 Summary of Findings

This study looked into the connection between government spending and GDP. It aimed to respond to the question: What is the correlation amid GDP and government expenditure, and what causes what? Data for Kenya was acquired for this answer from the National Bureau of Statistics of Kenya and World Bank publications. The information is available from 1963 to 2018.

The research employed Pearson's chi-square test to estimate correlation and causality in the variables. The person's causality tests show a positive relationship between GDP, government spending, and exchange rates. According to this, time series research demonstrates that while government expenditure lowers GDP temporarily, this effect changes over time. This suggests that the amount of government spending may affect the level of GDP. However, how much the government spends will depend on the level of the economy. Government spending can directly affect national income by creating jobs and stimulating economic activity. The level of national income will also influence how much the government spends. The amount of tax revenue collected by the government is determined by the level of national income. This tax revenue will be used to fund the government's spending. The national income level also determines the government spending required to maintain a given economic activity.

According to the findings, there is an indirect feedback loop connecting the GDP level to the amount of government spending. The value of all finished products and services produced in a nation during a given time period is represented by the GDP. The entire amount of money spent by the government in a specific time frame is known as government spending. Government spending, one of the elements of GDP, is what triggers the feedback loop. When the government spends more money, it puts more money into the economy, which can cause the GDP to rise.

As the government has more money to spend, an increase in GDP can increase government spending. The feedback loop can be either positive or negative depending on the GDP and degree of government spending. A positive feedback loop develops when government spending is lower than GDP. In this case, increased government spending can lead to increased GDP, which can then lead to increased government spending. This can result in a virtuous circle in which the increase in government yields both Wagner's law and Keynesian ideas when tested with data. Wagner contends that economic progress is invariably accompanied by increased state activity and government spending. Similarly, Keynesians believe that increasing government spending on productive expenditure raises the country's productivity, which leads to higher output due to increased aggregate demand.

5.3 Conclusion

In this study, the dynamic interactions involving real GDP, total government expenditure, and the size of the state were looked at in order to better understand the connection between GDP and government spending. According to the empirical results, government expenditure affects GDP, and in the long run, their relationship is mostly feedback-causal. Government expenditure accelerates economic growth by increasing aggregate demand.

However, as the size of the government grows, the marginal return on investment decreases, implying that the effect of government spending on economic growth is diluted. Infrastructure and education investments are made as a result of government funding. Long term, this results in a more productive economy. However, if the government gets bigger, it can crowd out private investment and become less effective, diminishing this effect. This discovery explains why government spending and, by extension, government size, tend to increase as GDP levels increase. Long-term, therefore, higher government spending boosts economic growth; yet, the consequences of higher government size may counteract this benefit.

Consistent data also shows that the effect of overall government spending, which is typically duplicated by recurrent expenses, is short-term negative but long-term favorable. The overall expenditure of the government comprises both its outlays and its recurring spending, such as staff wages and benefits (such as building new roads and bridges). Total government spending may have a short-term negative effect if it discourages private investment, but it may have a long-term beneficial effect if it promotes economic growth. The Kenyan data, however, provide no proof that GDP is influenced by increasing supply. Over the mid to long term, persistent impacts of government expenditure and size on GDP are minimal. It means that if the government wants to stimulate the economy in the short run, it should cut recurrent expenditures. Still, it should increase recurrent spending if it wants to smooth out the business cycle or promote long-run growth.

Kenya can use government spending to stimulate economic growth. One of the most direct ways is through infrastructure spending. This can be used to create jobs and spur economic activity directly. Government spending can also be used to fund research and development,

leading to new and innovative products and services being developed. This can also ripple effect through the economy as new industries and sectors are created. Finally, government spending can provide targeted tax breaks or subsidies to businesses, incentivizing them to invest and expand their operations. All of these government spending measures can be effective in stimulating economic growth.

5.4 Recommendation

The CBK is accountable in managing the value of the Kenyan shilling against foreign currencies, such as the US dollar, in order to maintain a healthy level of exchange rates. Exchange rates are important because they affect the competitiveness of Kenyan products on the global market. Poor economic growth in some countries is often attributed to an overvalued exchange rate. An overvalued currency makes exports more expensive and less competitive on international markets. When the value of a country's currency falls, its products become cheaper for foreign importers, increasing demand for its goods. The CBK has a mandate in ensuring monetary stability in the country, which is to preserve the value of the Kenyan shilling. The CBK makes purchases and sales in the foreign exchange market to influence the value of the local currency relative to the US dollar.

The Kenyan government can use its spending as an effective tool for stimulating economic growth in several ways. One is investing in key infrastructure projects that can make the economy more efficient and productive. This could involve building new roads, railways, and ports and investing in energy and water projects. Another way to use government spending to stimulate economic growth is by investing in education and training programs. This can help increase the workforce's skills and productivity, which can lead to higher economic growth. Finally, the government can also use its spending to support businesses

and industries that are important to the economy. This can include providing loans and grants to companies and investing in research and development. By using its spending in these ways, the Kenyan government can help to increase economic growth and improve the standard of living for its citizens.

5.5 Limitations

The study only examined how government expenditure affected Kenya's economic expansion while being influenced by inflation and exchange rates. Other elements, such as institutional elements or the function of the business sector in the economy, were not taken into account. This study's findings may not apply to other countries with different economic policies and institutions. There needed to be an attempt to quantify the impact of the other variables on economic growth. Furthermore, this study should have looked at how these variables interact with one another, which would have provided more information.

Research on the effects of fiscal policy on economic growth in Kenya is restricted because information on government spending is only accessible beginning in 1963. Any analysis of how government expenditure has affected economic development is restricted to the period from 1963 to 2018. Additionally, since information on government expenditure is only available on an overall basis, it is impossible to analyze the effects of various government expenditure programs on income progress.

5.5 Suggestions for Further Studies

Other studies could explore the research bearing other factors that could affect the economy and its growth, such as other types of spending by the government or other types of tax increases by the government. Future research must examine how these additional factors affect the expansion of the economy.

The effect of particular government spending on economic growth has been extensively studied. Unfortunately, there isn't a certain agreement on the best ways to spend money.. Some economists argue that spending on infrastructure is most beneficial, while others say spending on education is most helpful. The answer likely depends on the specific circumstances of each country. In terms of the composition of government expenditure, it is generally accepted that spending on infrastructure and education is most beneficial for economic growth. Some research has also suggested that certain types of social spending can be helpful, mainly if it targets the poorest and most vulnerable in society. It would be interesting to study whether government expenditure affects economic growth in various sectors or regions.

To find the optimal strategies, another study should compare the effect of government spending on economic growth in Kenya to that in other nations. Comparing the various forms of public spending across nations to ascertain which are most effective in fostering economic growth could be a part of future research into how government spending affects economic development globally. If there is a relationship between government expenditure and economic development, the study might examine how governments spend their money differently in different nations. Additionally, studying how particular government policies affect economic growth in various nations could offer insights into the strategies that are most successful at fostering economic growth.

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APPENDICES

Appendix I: Data Collection Form

Quarter/ Year	1963	1964	1965	n1	n2	2018
Annual GDP						
Total Government Expenditure						
CPI INDEX						
TWI INDEX						

DATA SET

year	expenditure	GDP	CPI	WTI
1963	41244.36	696336.96	0.7	7.14
1964	53033.95	730906.38	-0.1	7.14
1965	48739	745590.98	3.58	7.14
1966	50997.07	855405.84	5.01	7.14
1967	54437.94	884158.01	1.76	7.14
1968	77636.17	954737.61	0.37	7.14
1969	87843.57	1030727.32	-0.17	7.14
1970	90849.72	982742.35	2.19	7.14

1971	104499.53	1200654.58	3.78	7.14
1972	113330.58	1405755.55	5.83	7.14
1973	117412.01	1488647.05	9.28	7
1974	127432.01	1549169.75	17.81	7.14
1975	142653.25	1562836.57	19.12	7.34
1976	153207.81	1596499.52	11.45	8.37
1977	171916	1747429.35	14.82	8.28
1978	197395.34	1868220.3	16.93	7.73
1979	208694.91	2010489.49	7.98	7.48
1980	213426.11	2122915.59	13.86	7.42
1981	201936.06	2203024.75	11.6	9.05
1982	198894.58	2236212.83	20.67	10.92
1983	215908.45	2265485.98	11.4	13.31
1984	215933.03	2305250.18	10.28	14.41
1985	218123.51	2404388.89	13.01	16.43

1986	233721.1	2576965.23	2.53	16.23
1987	241297.15	2729962.43	8.64	16.45
1988	245773.36	2899307.01	12.26	17.75
1989	249281.82	3035294.63	13.79	20.57
1990	260741.14	3162535.72	17.78	22.91
1991	275905.55	3208023.95	20.08	27.51
1992	301079.2	3182376	27.33	32.22
1993	323659.91	3193616.06	45.98	58
1994	418796.89	3277697.09	28.81	56.05
1995	459964.44	3422119.52	1.55	51.43
1996	472428.38	3564029.32	8.86	57.11
1997	470285.61	3580954.96	11.36	58.73
1998	487017.36	3698776.03	6.72	60.37
1999	475438.8	3784047.19	5.74	70.33
2000	464809.99	3806739.95	9.98	76.18

2001	477678.3	3950631.16	5.74	78.56
2002	485519.47	3972235.56	1.96	78.75
2003	514697.42	4088720.4	9.82	75.94
2004	517693.19	4297420.95	11.62	79.17
2005	513639.23	4551255.25	10.31	75.55
2006	503278.08	4845834.99	14.45	72.1
2007	544276.96	5177810.05	9.76	67.32
2008	590813.28	5189837.21	26.24	69.18
2009	642000	5361462	9.23	77.35
2010	678000	5793514	3.96	79.23
2011	696000	6090206	14.02	88.81
2012	790000	6368448	9.38	84.53
2013	771000	6610312	5.72	86.12
2014	800000	6942157	6.88	87.92
2015	909472	7287024	6.58	98.18

2016	957593.9	7594064	6.3	101.5
2017	1017294.1	7883816	8.01	103.41
2018	1088333	8327604	4.69	101.3