PUBLIC EXPENDITURE COMPOSITION ON ECONOMIC GROWTH IN KENYA: 1972-2009

KIPKOGEI MENGICH KUTOL
C/50/P/8211/2001

RESEARCH PAPER PRESENTED TO THE SCHOOL OF ECONOMICS, IN PARTIAL FULFILMENT FOR THE REQUIREMENTS FOR THE DEGREE OF MASTERS OF ARTS IN ECONOMICS OF UNIVERSITY OF NAIROBI.

2010
DECLARATION

This research paper is my original work and has never been presented for the award of a degree in any other University.

Signature

Kipkogei Mengich Kutol
C/50/P/8211/2001

This research paper has been submitted for examination with our approval as University Supervisors:

Signature

Dr. Samwel Nyandemo

Signature

Dr. Nelson H. Wawire

ii
DEDICATION

To my parents who have been my source of encouragement.
ACKNOWLEDGMENTS

Above all, I thank Almighty Lord for the strength given unto me to complete this work. I sincerely wish to thank God for the good health; strength and grace freely granted. God continually gave me favour and guidance so that when I sometimes ran out of ideas, He freely gave me new ideas.

I am greatly indebted to my devoted supervisors Dr. Samwel Nyandemo and Dr. Nelson H. Wawire for their guidance, encouragement and intellectual critique of this work. They were always available, ready and willing to assist within and outside office hours, on phone and in person. I am very grateful for their unrelenting support. I extend this gratitude to all the lecturers in the School of Economics, University of Nairobi for their guidance during the course.

To my dear friends Ayabei, Gitau and Abijah who did the typing of this work. Their encouragement, moral and material support enabled me to complete this course.

The start and completion of this work would not have materialized without the input of various individuals some of whom I may not be able to mention here. But nonetheless I thank them all.

God Bless You all
# TABLE OF CONTENTS

Title .................................................................................................................................................. i

Declaration ........................................................................................................................................ 11

Dedication .......................................................................................................................................... 111

Acknowledgments

Table of Contents ................................................................................................................................. v

List of Tables ....................................................................................................................................... viii

List of Figures ...................................................................................................................................... ix

Acronyms and Abbreviations ........................................................................................................... x

Operational Definition of Terms ....................................................................................................... xi

Abstract ............................................................................................................................................... xiii

**CHAPTER ONE: INTRODUCTION** ............................................................................................... 1

1.1 Background ................................................................................................................................ 1

1.2 General trends in growth of government expenditure ............................................................. 1

1.3 Overview of Economic Growth ................................................................................................. 8

1.4 Composition of Expenditure by Economic Type ..................................................................... 18

1.5 Composition of Expenditure by Function .............................................................................. 21

1.6 The Statement of the Problem ................................................................................................. 28

1.7 The Research Questions .......................................................................................................... 29

1.8 The Objective of the Study ....................................................................................................... 29

1.9 The Significance of the Study ................................................................................................. 30

1.10 The Scope of The Study ........................................................................................................ 31

**CHAPTER TWO: LITERATURE REVIEW** .................................................................................. 32

2.1 Introduction ............................................................................................................................... 32
2.1 Theoretical Literature Review
2.3 Empirical Literature Review
2.4 Overview of Literature

CHAPTER THREE: METHODOLOGY
3.1 Introduction
3.1 Theoretical Framework
3.1 Model Specification
3.4 Definition of Variables and Measurement of Variables
3.5 Data Type and Source
3.6 Time Series Properties of data
3.7 Estimation Procedures
3.7.1 Testing for Stationarity
3.7.2 Testing for Cointegration
3.7.3 Granger Causality Test
3.7.4 The Error Correlation Model
3.8 Data Analysis

CHAPTER FOUR: EMPIRICAL RESULTS AND INTERPRETATION
4.1 Introduction
4.2 Stationarity Tests Results
4.2 Cointegration Test
4.3 Diagnostic Test Results
4.3.1 Normality Test
4.3.2 Serial Correlation and Arch Test
LIST OF TABLES

Table 1.1: Growth of General Government Expenditure, 1870-2008 (% of GDP) ........ 4
Table 1.2: Average Annual Growth Rates (%) of Real GDP by Sector ..................... 13
Table 1.3: Revenue, Expenditure, Savings and Investment as% of GDP .................. 16
Table 4.1: Granger Causality Test ................................................................. 58
Table 4.2: Regression Results ......................................................................... 60
Table A-1: Unit roots ADF Stationary Test at Level ........................................... 74
Table C-2: LM-test and ARCH test results ......................................................... 77
LIST OF FIGURES

Figure 1.1: Trend of Aggregate Level of Government Expenditure in Africa ...............6

Figure 1.2 Scatter Plot of GDP Growth rates Against Public Expenditure for COMESA Member Countries .................................................................7

Figure 1.3 Total Government Expenditure, Current and Capital Spending (% GE) Trends 19

Graph C-1: Normality test................................................................................................................77
# ACRONYMS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAP</td>
<td>Capital to total government expenditure ratio.</td>
</tr>
<tr>
<td>COMESA</td>
<td>Common Market for Eastern and Southern Africa</td>
</tr>
<tr>
<td>ERS</td>
<td>Economic Recovery Strategy</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>ODA</td>
<td>Overseas Development Assistance</td>
</tr>
<tr>
<td>OECD</td>
<td>Organization for Economic Co-operation and Development</td>
</tr>
<tr>
<td>SAPs</td>
<td>Structural Adjustment Programmes</td>
</tr>
<tr>
<td>SOEs</td>
<td>State Owned Enterprises</td>
</tr>
<tr>
<td>PRSP</td>
<td>Poverty Reduction Strategy Paper</td>
</tr>
<tr>
<td>WER</td>
<td>Weighted average exchange rate.</td>
</tr>
</tbody>
</table>
OPERATIONAL DEFINITION OF TERMS

Economic growth: This is the increase in the value of goods and services produced in an economy. It is measured as the percent rate of increase in real gross domestic product, or GDP. It is calculated in real terms, i.e. inflation-adjusted terms, in order to net out the effect of inflation on the price of the goods and services produced.

Economic Infrastructure: It is the basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. It refers to the technical structures that support a society such as roads, water supply, sewers, power grids, telecommunications, and so forth that facilitates the production of goods and services.

Government expenditure: It is the government acquisition of goods and services for current use to directly satisfy individual or collective needs of the members of the community (government final consumption expenditure) and to create future benefits, such as infrastructure investment or research spending (government investment). Another government is through transfer payments. Government expenditure can be financed by seigniorage, taxes, or government borrowing.

Gross Domestic Product: It is the total market value of the goods and services produced by a nation's economy during a specific period of time. GDP is customarily reported on an annual basis.
**Market failure**: It is a concept within economic theory wherein the allocation of goods and services by a free market is not efficient. It can be viewed as scenarios where individuals' pursuit of pure self-interest leads to results that are not efficient.

**Per Capita GDP**: It is the value of goods produced per person in the country. It equals to the country's GDP divided by the total number of people in the country.
ABSTRACT

Faced with severe macroeconomic imbalances in the past, Kenya has been forced to cut down aggregate spending and deficits. Due to tightening budget constraints non growth-enhancing expenditures may crowd out outlays that possibly boost economic growth. As such, the purpose of this study was to find out public expenditure composition and economic growth in Kenya from 1972 to 2009. The specific objectives of the study were to investigate the relationship between expenditure on education and economic growth, to find out the effect of defense expenditure by the government on economic growth, to investigate the effect of government expenditure on health on the economic growth, to investigate the effect of government expenditure on agriculture on the economic growth and to find out the effect of government expenditure on transport and communication infrastructure on economic growth in Kenya.

The growth models specified in this study only takes into account potential determinants of growth in Kenya. The key explanatory variable in the model is growth per capita. This is the increase of per capita GDP or other measure of aggregate income. This study employed use of annual Kenyan data for the period 1972 to 2009 for all the variables. Augmented Dickey-Fuller (ADF) tests were used to test for stationarity of the time series. The study conducted Stationarity Test, Causality Test, Cointegration Test and build an Error Correction Model in that order for estimation procedures.

The total expenditure on transport and communication infrastructure was statistically significant. The coefficient of this variable is positive suggesting that one unit increase in expenditure on transport and communication infrastructure yields 0.46 unit increases in Kenya's economic growth. The study concludes that average government expenditure and potential output are linked by a long-run relation such that government spending grows almost in proportion with potential output. The study recommends adoption of policies that lead to the creation of diversified, dynamic, and competitive sectors capable of absorbing the more educated labor force to translate human capital into higher economic growth.

xiii
CHAPTER ONE
INTRODUCTION

1.1 Background

Economic growth has always been the focal point of development studies' literature. One specific point of interest in this respect has been the role of government in acting as a catalyst in promoting rapid economic growth through the development of an appropriate legal, administrative, and economic infrastructure (Stern, 2002). Luminaries confining the list to pre 1950 writers include Adam Smith in the critique of mercantilist policy through Smith (1776), argued that a market oriented economy based on natural liberty is proficient at providing goods and services (Stiglitz, 2000). It acknowledged the potential for government intervention to support market mechanism. Specifically defense, administration of social order, elementary education and certain institutions and public works were singled out.

In the late 1980s and early 1990s for example, calls of getting the government out of the economy dominated the policy arena on one hand (World Bank, 1991 and IMF, 1990). On the other hand public goods, merit goods, externalities and market failure are some of the buzzwords that have continued to define technical discussion in the unifying theories of the role of governments.

1-2 General trends in growth of government-expenditure

role and size of government in the economy have changed remarkably over the last
two centuries (Samuelson, 2001). Although there is no single desirable level of aggregate spending that would maximize welfare, it should be consistent with the medium-term macroeconomic framework. In the real world, there is a great disparity which exists among countries. In 1994, for instance, total government expenditure ranged from 11.2 percent of GDP in El Salvador to almost 64 percent in Oman (World Bank, 2000). The permissible aggregate level of spending depends upon the composition and sustainability of the budget deficit. Depending on how they are financed, high or rising budget deficits may result in particular macroeconomic imbalances like the financing of deficits through excessive external borrowing may result in a debt crisis also excessive domestic borrowing may lead to higher interest rate and crowd out private investment and excessive use of foreign reserves may lead to a crisis in the balance of payments; seigniorage leads to inflation (Pradhan, 1996).

The government spending since 1870 has been on the increase in most of the industrialized countries (Stiglitz, 2000). Among the Organization for Economic Co-operation and Development (OECD) countries, for example, general government expenditure averaged 10.7 percent of GDP in the late nineteenth century for twelve countries for which data was available (Tanzi and Schuknecht, 2000). This reflects the classical economists and political philosophers thinking that governments' role should be limited to national defense, police and administration, but otherwise out of private decisions about investment.

Towards the turn of the nineteenth century, public provision of primary education was already predominant and the redistributive role of governments was gradually legitimized
(Tanzi and Schuknecht, 2000). This culminated to an increase in average public spending to around 11.9 percent in 1913 (Tanzi and Schuknecht). For the next seven years or so, spending grew rapidly to an average of 18.7 percent, mainly as a result of increased military and other war-related expenses during World War I. The great depression was widely interpreted as a failure of the market economy and presented an opportunity for a wave of expansionary expenditures policies. With the Keynesian revolution in the 1930's, which effectively added a stabilization function to the traditional aspects of fiscal policy, aggregate demand was elevated to being a major factor in determining the level of employment and economic growth. Consequently, public spending assumed a new and strategic role in the economy and was henceforth reinvigorated. Its Keynesian demand policy application was, however, to be most pronounced much later in the period 1960s to 1970s. Around the early 1980s, new skepticism about benevolent governments began, motivated by the following observations (Stern, 2002).

The attempts to use Keynesian stabilization policies to reduce variability in output and the intensity of business cycles, variability in output still persisted, even at the height of the policies' years (1960s -1980s). Further, the standard deviation was generally observed to have increased with the size of government (Stern, 2002).

The temporary Keynesian demand pressures too often tended to become permanent commitments and the increases in expenditure were usually not matched by revenue increases. Consequently, serial fiscal deficits gave rise to significantly large accumulations of public debt. Some of the programs pursued* particularly in the form of transfers effectively amounted to implicit financial liabilities, resulting in ever
increasing tax burdens (Sturm, 1998).

Since the early 1980s therefore, the increase in spending has been less dramatic, in some instances having declined, and this scaling down is likely to prevail into the future (Tanzi and Schuknecht, 2000). The table below shows the growth of general government expenditure from 1890 to 2008 among the developed countries.

Table 1.1: Growth of General Government Expenditure, 1870-2008 (% of GDP).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>18.3</td>
<td>16.5</td>
<td>19.3</td>
<td>14.8</td>
<td>21.2</td>
<td>34.1</td>
<td>34.9</td>
<td>35.9</td>
<td>41.7</td>
<td>45.3</td>
</tr>
<tr>
<td>Austria</td>
<td>10.5</td>
<td>17</td>
<td>14.7</td>
<td>20.6</td>
<td>35.7</td>
<td>48.1</td>
<td>38.6</td>
<td>51.6</td>
<td>48.7</td>
<td>50.8</td>
</tr>
<tr>
<td>Canada</td>
<td>16.7</td>
<td>25</td>
<td>28.6</td>
<td>38.8</td>
<td>46</td>
<td>44.7</td>
<td>41.6</td>
<td>46.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>12.6</td>
<td>17</td>
<td>27.6</td>
<td>29</td>
<td>34.6</td>
<td>46.1</td>
<td>49.8</td>
<td>55</td>
<td>53.8</td>
<td>57.9</td>
</tr>
<tr>
<td>Germany</td>
<td>10</td>
<td>14.8</td>
<td>25</td>
<td>34.1</td>
<td>32.4</td>
<td>47.9</td>
<td>45.1</td>
<td>49.1</td>
<td>50.7</td>
<td>55.5</td>
</tr>
<tr>
<td>Italy</td>
<td>13.7</td>
<td>17.1</td>
<td>30.1</td>
<td>31.1</td>
<td>30.1</td>
<td>42.1</td>
<td>53.4</td>
<td>52.7</td>
<td>50.1</td>
<td>56.9</td>
</tr>
<tr>
<td>Ireland</td>
<td>18.8</td>
<td>25.5</td>
<td>28</td>
<td>48.9</td>
<td>41.2</td>
<td>42.0</td>
<td>40.3</td>
<td>43.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan</td>
<td>8.8</td>
<td>8.3</td>
<td>14.8</td>
<td>25.4</td>
<td>17.5</td>
<td>32</td>
<td>31.3</td>
<td>35.9</td>
<td>36.3</td>
<td>38.7</td>
</tr>
<tr>
<td>New Zealand</td>
<td>24.6</td>
<td>25.3</td>
<td>26.9</td>
<td>38.1</td>
<td>41.3</td>
<td>34.7</td>
<td>37.1</td>
<td>40.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>5.9</td>
<td>9.3</td>
<td>16</td>
<td>11.8</td>
<td>29.9</td>
<td>43.8</td>
<td>54.9</td>
<td>49.2</td>
<td>51.8</td>
<td>56.1</td>
</tr>
<tr>
<td>Sweden</td>
<td>5.7b</td>
<td>10.4</td>
<td>10.9</td>
<td>16.5</td>
<td>31</td>
<td>60.1</td>
<td>59.1</td>
<td>64.2</td>
<td>62.3</td>
<td>63.8</td>
</tr>
<tr>
<td>Switzerland</td>
<td>16.5</td>
<td>14</td>
<td>17</td>
<td>24.1</td>
<td>17.2</td>
<td>32.8</td>
<td>33.5</td>
<td>39.4</td>
<td>36.6</td>
<td>38.7</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>9.4</td>
<td>12.7</td>
<td>26.2</td>
<td>30</td>
<td>32.2</td>
<td>43</td>
<td>39.9</td>
<td>43</td>
<td>45.3</td>
<td>46.7</td>
</tr>
<tr>
<td>United State</td>
<td>7.3</td>
<td>7.5</td>
<td>12.1</td>
<td>19.7</td>
<td>27</td>
<td>31.4</td>
<td>32.8</td>
<td>32.4</td>
<td>46.4</td>
<td>47.9</td>
</tr>
<tr>
<td>JSDgium*</td>
<td>13.8</td>
<td>22.1</td>
<td>21.8</td>
<td>30.3</td>
<td>57.8</td>
<td>54.3</td>
<td>52.9</td>
<td>49.3</td>
<td>51.2</td>
<td></td>
</tr>
<tr>
<td>Netherlands*</td>
<td>9.1</td>
<td>9</td>
<td>13.5</td>
<td>19</td>
<td>33.7</td>
<td>55.8</td>
<td>54.1</td>
<td>49.3</td>
<td>51.6</td>
<td>50.4</td>
</tr>
<tr>
<td>Spain*</td>
<td>11</td>
<td>8.3</td>
<td>13.2</td>
<td>18.8</td>
<td>32.2</td>
<td>42</td>
<td>43.7</td>
<td>42.1</td>
<td>44.5</td>
<td></td>
</tr>
<tr>
<td>[ w j ^ r ]</td>
<td>10.7</td>
<td>12.7</td>
<td>18.7</td>
<td>22.8</td>
<td>27&lt;&gt;</td>
<td>43.1</td>
<td>44.8</td>
<td>45.6</td>
<td>46.2</td>
<td>49.1</td>
</tr>
</tbody>
</table>
Source: Vito Tanzi and Ludger Schuknecht, (1997 and 2008)

According to table 1.1 above the growth of general government expenditure has been on the increase in the developed countries. It rose from an average of 10.7 percent in 1870s to 49.1 percent in 2008.

As the size of governments increased, the compositions of expenditure have also been widening in scope from the classical roles played over a century ago.

In 1980s and 1990s substantial increases have been recorded in government real expenditures (comprising wages, salaries, materials and other supplies purchased by governments) and subsidies and transfers through social security systems (Pradhan, 1996). The changes have been brought about by a combination of factors. With respect to transfers, the expansion can be attributed to two main factors. First, demographic changes, especially an increase in aging population, and second, political influences which have turned limited social safety nets into universal benefits.
The slow down in growth of governments has not been limited to industrial countries as figure 1.1 above shows that the average public expenditure among African countries has also witnessed a considerable decline as these countries strived to implement Structural Adjustment Programmes (SAPs) in 1980s and 1990s. It must however be noted that different sectors received different treatment.

For the period 1991-2001, Democratic Republic of Congo (DRC), Madagascar, Sudan, Uganda, Rwanda and Mauritius had an average government size below 25 percent of their output.

Figure 1.2 Scatter Plot of GDP Growth rates Against Public Expenditure for COMESA Member Countries.

According to figure 1.2 above the case of Uganda and Mauritius, for instance, demonstrates that a small government can potentially be as effective as a large government in providing the necessary environment conducive for growth.

The scatter plot (Figure 1.2) further reveals a pattern suggesting that the role of public expenditure in fostering economic growth is adversely affected in countries with big governments. This is possibly a reflection of a crowding out effect and inefficiencies arising, from-distortionary taxes.
1.3 Overview of Economic Growth

Kenya gained independence in 1963 at the height of great expectations in the ability of governments to provide services around the world. Consequently, she embraced the then prevailing development paradigm of "African Socialism" designed to achieve "economic sovereignty" among other independent African Nations. Through this, it hoped to effect income/asset redistribution in favor of indigenous populations and extend greater welfare to its people. In contrast with the strict socialist models followed in other African countries, however, Kenya incorporated market-based structures supportive of the private sector and open to foreign investment as part of the industrialization strategy (O'Brien and Ryan, 1999).

Given the lack of both entrepreneurial skills in the indigenous population and private capital at the time, the government undertook direct roles in the economy through state-owned enterprises (SOEs). Several of these SOEs had their roots in the colonial government but were maintained after independence.

Creation of public enterprises quickly turned out to be a major policy strategy in the government's endeavor to expand job opportunities, accelerate industrialization, and redistribute income. The government held substantial shares in enterprises engaged in a wide range of activities including: manufacturing, food processing, building and construction, banking, insurance, mining, transport and trading. The number of such enterprises numbered over 250 by 1990 (EAMAT, 1999).
The overall objective of these interventions was to reduce the incidences of poverty and illiteracy, provide employment and reduce foreign domination in the economy. Indeed, tremendous progress was made in achieving these objectives during the early years, from immediately after independence up to the mid 1970s. According to the Republic of Kenya (2002) for instance, the number of public servants rose from 60,000 in 1960 to over 272,000 in 1991.

Inefficiency and corruption in the 1970s began to take a toll on the productivity of the public sector in general and state enterprises were gradually, but surely, turned into cash cows. Further, the treasury continued to release money to ministries without assessing what the ensuing expenditures had achieved or created. At the same time, unbudgeted expenditures were frequently introduced into the budget without making available corresponding supplementary funds to undertake the extra activities. A review of Public Expenditure Reviews conducted in 1997 and again in 2002/03 showed that the use of public resources had not achieved the desired objectives. In the first place, little prioritization was done when budgeting and no efforts were made to ensure timely and efficient implementation of public programmes and projects. Secondly, even in cases where projects had been completed, they were hardly ever used optimally due to the combination of lack of recurrent resources, and unreliability of resource flows (Republic of Kenya, 2003).

The period between 1986 and 1990, for instance, SOEs accounted for 16 percent of gross fixed capital formation. However, whereas overall GDP grew at an average of 5. percent a year, average growth of SOEs was only 0.5 percent a year. With investments of about
SI.4 billion by 1980, the government was receiving a dismal return of 0.2 percent, equivalent to one percent of the average total government expenditure during this period. Additionally, subsidies to loss making state enterprises averaged 0.3 percent of GDP between 1986 and 1991 (EAMAT, 1999).

Kenya in the past has been faced with severe macroeconomic imbalances occasioned by low levels of growth amid falling productivity and competitiveness in lead sectors of the economy (agriculture and manufacturing), poor governance, dilapidated infrastructure and debt burden. The situation has further been compounded by the bloated coalition government which came into being in 2008 after post election violence.

This has forced the government to cut back public spending, thereby exposing it to the difficult choices about how to restructure the allocation of resources, both within and across sectors, in order to meet overall fiscal targets. At the same time, there has been growing criticism from the general public and development partners over the structure of government spending in Kenya, which is heavily skewed towards consumption and debt servicing at the expense of capital spending in all major functions.

Currently Vision 2030 is the country's new development blueprint covering the period 2008 to 2030 (Republic of Kenya 2007). It aims to transform Kenya into a newly industrializing, middle-income country providing a high quality life to all its citizens by the 2030. The vision is based on three pillars; the economic, the social and the political. The adaption of the Vision by Kenya comes after the successful implementation of the
Economic Recovery Strategy for wealth and employment creation (ERS) which has seen the country’s economy back on the path to rapid growth since 2002, when GDP grew from a low of 0.6% and rising to 7.1% in 2007. The economic pillar aims to improve the prosperity of all Kenyans through an economic development programme, covering all regions of Kenya. It aims to achieve an average Gross Domestic Product (GDP) growth rate of 10% per annum beginning in 2012.

The social pillar seeks to build a just and cohesive society with social equity in a clean and secure environment. The political pillar aims to realize a democratic political system founded on issue-based politics that respects the rule of law and protects rights and freedoms of every individual in Kenya society. After a disappointing performance in the 1990’s Kenya’s economy has now resumed the path to rapid growth, having achieved a GDP annual growth rate of 7.1% in 2007 compared to 0.6% in 2002.

Under Vision 2030, Kenya aims to increase annual GDP growth rates to an average of 10% over the Vision horizon. It is an ambitious goal. If the goal is achieved, Kenya will be the 5th coming in the World to achieve such a high level of sustained economic growth considering that the current economic growth that has come primarily through rapid utilization of existing capacity, rather than efficiency gains or investments, achieving the 10% growth will require a dedicated campaign to alleviate existing constraints to future growth and in particular to use our resources more efficiency.

Kenya should continue with the tradition of macro-economic stability that has been established since 2002 to achieve this ambition plan. It should also address over key constraints, notably, a low savings to GDP ratio, which could be accelerated by drawing
in more remittances from Kenyans abroad, as well as increased foreign investment and Overseas Development Assistance (ODA), as spelt out under the Kenya Joint-Assistance Strategy between the country and her international development partners. Delivering the country's ambitious growth aspirations will require a rise of national savings from the current necessary to deal with a significant informal economy employing 75% of the country's workers. The informal sector must be supported in ways that will raise productivity and distribution and increase jobs, owner's incomes and public revenues. The country will continue with governance and institutional reforms necessary to accelerate economic growth.

The six key sectors have been given priority by the vision in acting as key growth drivers in the journey to vision 2030 are Tourism, Agriculture, wholesale and Retail trade sector, Manufacturing for the regional market, Business process off-shoring and the financial services (Republic of Kenya, 2007).

In the year 2001, the main vehicle through which identification and prioritization of publicly funded programs was the Poverty Reduction Strategy Paper (PRSP). The principle objective of the PRSP was to link and harmonize policy, planning and budgeting. In furtherance of these objectives, the government adopted the Medium Term Expenditure Framework (MTEF) in 2000/01 for the budgetary process (PRSP, 2001). The expectation was that the new system would lead to more predictable allocation of resources and, hopefully, narrcAv the fiscal gap. In addition, the government had committed ta channeling more budgetary resources to growth-enhancing and poverty-reducing areas, while prioritizing competing claims and rationalizing allocation of scarce
in more remittances from Kenyans abroad, as well as increased foreign investment and Overseas Development Assistance (ODA), as spelt out under the Kenya Joint-Assistance Strategy between the country and her international development partners. Delivering the country's ambitious growth aspirations will require a rise of national savings from the current necessary to deal with a significant informal economy employing 75% of the country's workers. The informal sector must be supported in ways that will raise productivity and distribution and increase jobs, owner's incomes and public revenues. The country will continue with governance and institutional reforms necessary to accelerate economic growth.

The six key sectors have been given priority by the vision in acting as key growth drivers in the journey to vision 2030 are Tourism, Agriculture, wholesale and Retail trade sector, Manufacturing for the regional market, Business process off-shoring and the financial services (Republic of Kenya, 2007).

In the year 2001, the main vehicle through which identification and prioritization of publicly funded programs was the Poverty Reduction Strategy Paper (PRSP). The principle objective of the PRSP was to link and harmonize policy, planning and budgeting. In furtherance of these objectives, the government adopted the Medium Term Expenditure Framework (MTEF) in 2000/01 for the budgetary process (PRSP, 2001). The expectation was that the new system would lead to more predictable allocation of resources and, hopefully, narrower the fiscal gap. In addition, the government had committed to channeling more budgetary resources to growth-enhancing and poverty-reducing areas, while prioritizing competing claims and rationalizing allocation of scarce
resources. Inevitably, arriving at an optimal allocation of public resources that will make these objectives a reality would require information on the relative impact of the various public expenditure programmes on economic growth and poverty reduction.

The average annual growth rates of the real GDP by sector in phases is shown in table 1.2 below.

**Table 1.2: Average Annual Growth Rates (%) of Real GDP by Sector.**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture</td>
<td>4.6</td>
<td>3.9</td>
<td>3.3</td>
<td>0.4</td>
<td>1.1</td>
<td>8.8</td>
<td>1.4</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>9.1</td>
<td>10.0</td>
<td>4.8</td>
<td>3.0</td>
<td>1.3</td>
<td>8.5</td>
<td>4.6</td>
</tr>
<tr>
<td>Finance, Real Estate</td>
<td>9.8</td>
<td>12.4</td>
<td>6.7</td>
<td>6.6</td>
<td>3.6</td>
<td>2.3</td>
<td>8.4</td>
</tr>
<tr>
<td>Government Services</td>
<td>16.9</td>
<td>6.5</td>
<td>4.9</td>
<td>2.6</td>
<td>1.0</td>
<td>29.4</td>
<td>5.7</td>
</tr>
<tr>
<td>Private Households</td>
<td>3.5</td>
<td>14.5</td>
<td>10.0</td>
<td>10.3</td>
<td>5.6</td>
<td>4.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Others</td>
<td>-</td>
<td>8.8</td>
<td>7.7</td>
<td>3.6</td>
<td>2.3</td>
<td>3.4</td>
<td>3.6</td>
</tr>
<tr>
<td>Overall GDP</td>
<td>6.6</td>
<td>5.2</td>
<td>4.1</td>
<td>2.5</td>
<td>2.0</td>
<td>6.5</td>
<td>4.7</td>
</tr>
</tbody>
</table>


According to table 1.2 above the real GDP growth declined from an average of 4.1 percent in the 1980s to 2.5 percent in the first half of 1990s and further down to 2.0 percent in the latter half. There was also a sharp increase in the phase 2001 - 2004 to 6.5 percent and a slight decline to 4.7 percent in the last phase of 2005 -2009. The increase is attributed to the change of government which lead to introduction of new policies and resumption of lending by the donors and the decline was due to the post election violence of late 2007 and early 2008.

At the behest of Bretton Wood institutions and the wider donor community, Kenya was among the first group of African countries to accent to the implementation of SAPs in the
early 1980s, implicitly or explicitly aiming at reducing the role of government in the economy. The reform programmes were designed to improve the level of public savings and the efficiency in the use of public resources to reflect the cost of providing public services as well as restructure public enterprises to secure efficient market oriented operations. Under the SAPs, major reforms to be made included liberalizing trade and interest rates, abolition of price controls, privatization of SOEs and reforming the civil service (O'Brien and Ryan, 1999).

Public Enterprise Reform Programme (PERP) was launched in 1991 to guide the privatization of 207 non-strategic commercial enterprises and inculcate performance enhancing ethics in the remaining strategic enterprises which retained public ownership. While considerable progress has been made in curtailing the financial burden imposed on the exchequer by loss making SOEs (with some returning to profitability), major works still lie ahead (Republic of Kenya, 2002). It called for wider participation, for example, provoked the debate back to the question of foreign domination and, along with it, the need to re-orient the programme to allow for more stakeholder participation. This resulted in further delays of the reform programme.

The reform agenda announced in 1993 in the civil service was built around four main pillars: redefinition and rationalization of government function; staffing and management of the wage bill; package review and; training and capacity building through the introduction of modern working tools. The reforms, were, intended to. root out duplication efforts among separate government departments; redefine their core functions,
objectives and priorities and; put into place a well motivated and optimal civil service (right-sizing). Right sizing was (and continues to be) made through a combination of voluntary early retirement, compulsory retrenchment and natural attrition from a freeze on new employment. These efforts saw the number of civil servants decline from 272,000 in 1991 to 194,900 in 2002. Notwithstanding these reforms, the civil service wage bill has grown to a 9.0 percent of GDP high as of 2002 (Republic of Kenya, 2002). However this had negative impact on service delivery in the long run due to staff shortage brought by the above reasons. Since 2003 when the new government took over, employment embargo has been lifted however it has been demand driven.

The economic woes facing the country were largely the direct consequences of long-drawn inefficiencies and deeply entrenched corrupt practices abetted by the government of the day. It, therefore, lacked the moral authority and political goodwill necessary to implement such radical reforms due to vested interests. Granted, implementation was reluctantly and patchily done; with too many safeguards, poor sequencing and pacing that veritably served as recipes for stoppage and occasional reversal. For example, failure to rationalize fiscal expenditure during the early years of reform led to a debt scenario that to date remains a structural constraint to investment growth in the country (see table 1.3 below).

Thus, after nearly two decades of reforms, an overall assessment indicates that severe economic policy distortions, still persists. Specifically, savings remained low, the current account balance worsened, interest rates band widened—and in real terms was
largely negative—and a debt crisis loomed (EAMAT, 1999). In fact, analysts contend that the distortions expected to be removed were further reinforced during the first decade of reforms. The revenue, expenditure, savings and investment by the government as percentage of GDP is shown in table 1.3 below.

Table 1.3: Revenue, Expenditure, Savings and Investment as % of GDP (1964-2009).

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>24</td>
<td>27</td>
<td>24</td>
<td>25</td>
<td>25</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Grants</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Expenditure</td>
<td>25</td>
<td>33</td>
<td>34</td>
<td>36</td>
<td>26</td>
<td>33</td>
<td>34</td>
</tr>
<tr>
<td>Public debt</td>
<td>28</td>
<td>29</td>
<td>42</td>
<td>63</td>
<td>76</td>
<td>58</td>
<td>64</td>
</tr>
<tr>
<td>Savings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Savings</td>
<td>16.3</td>
<td>14.8</td>
<td>18.4</td>
<td>17.8</td>
<td>10.6</td>
<td>12.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Public Savings</td>
<td>0.9</td>
<td>2.2</td>
<td>-14</td>
<td>-1.6</td>
<td>1.2</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Gross Domestic Savings</td>
<td>17.2</td>
<td>17.0</td>
<td>17.1</td>
<td>16.2</td>
<td>11.8</td>
<td>13.7</td>
<td>13.7</td>
</tr>
<tr>
<td>Foreign Savings</td>
<td>2.5</td>
<td>6.8</td>
<td>7.1</td>
<td>3.8</td>
<td>5.8</td>
<td>6.2</td>
<td>4.9</td>
</tr>
</tbody>
</table>


There are seven distinct phases (Table 1.3) clearly identifiable in the Kenyan economy (Republic of Kenya, 2002 and Republic of Kenya 2009) a high growth period over the period 1964-73; an error of external shocks over 1974-79 characterized by oil price shocks and a coffee boom; a period of stabilization and structural adjustments in the 1980s and an era of liberalization and declining donor inflows from 1990 to 2002. In this section, we will closely follow the last three phases in our analysis. We will include data for 1971-72 in the second phase.

Moreover, we will break down the last phase into two 1996-2002 and 2003-2007 in order to isolate the last phases, where liberalization of the economy started in earnest and change of governance respectively.

The Economic Recovery Strategy for Wealth and Employment Creation (Government Printer) set key objectives for the period 2003-2007 which included creating 500,000 annually, reducing poverty level by at least 5 percent points from 56.8 percent level, achieving a high GDP growth rate -rising from an estimated 1.1 percent in 2002 to 2.3 percent in 2003 and 7 percent in 2006, containing average annual inflation rate to below 5 percent, increasing official foreign exchange reserves from US$ 1.1 billion or 2.8 months of imports cover in 2002 to US$ 1.7 billion or 35 months of import cover in 2007, containing the current account deficit in the balance of payments to an average of 6.2 percent of GDP and increasing of domestic savings so as to enable higher levels of investment for sustainable development (Republic of Kenya, 2003).

The strategy identified key policy actions necessary to spur the recovery of the economy and it based on four pillars which are rapid economic growth; strengthening of institutions of governance; rehabilitation and expansion of physical infrastructure in the human capital of the poor.
Out of the measures put in place through the strategy the economy has grown over time. The economy grew by 0.5 percent in 2002, 2.9 percent in 2003 it grew rapidly in 2004 to 2007 from 5.1 percent to 7.1 percent. There was a great decline in 2008 by 1.7 percent due to the post election violence due to the disputed elections of 2007 as well as poor rains across the country. Kenya's economy grew by 3.2 percent in 2009. This was largely driven by increased government spending and wholesale and retail trade.

In 2009/2010 budget, Kshs. 140 billion was allocated to infrastructure development. The amount is expected to spur growth in the construction industry, which has witnessed downturn in the economy. It is projected that agriculture performance will record decline despite effort to boost the sector due to prevailing erratic weather patterns.

In 2008 saw only 1.7% growth largely attributed to the post election upheaval and the global financial crisis. However the economy has shown sign of improvement, registering 3.9% growth in 2009 (Republic of Kenya, 2009).

1.4 Composition of Expenditure by Economic Type

During the first two phases (1971-79 and 1980-89), the ratio of public expenditure to GDP averaged 35.0 percent and 36.0 percent, respectively. In the third phase (1990-1995), this ratio shot to an average of 45.3 percent. But as seen in appendix 1, the growth of public expenditure has been on the decline since the mid 1990s, with the exception of 1997. This could be attributed to both domestic and international pressure on the government to cut fiscal excesses, as attention shifted to negative implications such as inefficiencies, corruption, excessive taxes and rent seeking behavior.

Public expenditure mix by economic type during the first phase of our review period was well balanced by any standards; it is a reflection of the importance attached to the development of physical infrastructure during the post-independent era with a current to capital ratio of 70 percent to 30 percent, respectively. This balance was tilted in favour of more current expenditure during the 1980s when public expenditure comprised of 77.9 percent current and 22.1 percent capital. As seen from figure 3 below, the result of the SAPs was rather paradoxical. During the period 1990-1995, the skewed allocation witnessed in the period 1980-89 deteriorated by recording 83.1 percent current and 16.9 percent capital, and further down in 1996-2002 by posting 89.7 percent and 11.3 percent current and capital, respectively (Republic of Kenya). In a nutshell, while current expenditure has almost consistently been on the rise since the 1980s, public capital expenditure has been on the decline over the same period, absorbing most of the reductions in aggregate spending.
The above analysis (figure 1.3) indicates that it has been politically more acceptable to cut down (or postpone) on capital than current expenditures in the event of a demand for fiscal restraint. In December 2002, the National Rainbow Coalition (NARC) government came to power, ending Kenya African National Union (KANU) nearly four decades of uninterrupted rule since independence. At the time of assuming the mantle of leadership, the structure of public expenditure was such that nearly all revenues were used for consumption and debt service. Hardly any resources were spared for operations and maintenance and the little that was allocated for development made it impossible to complete projects on time. The Impact of this is demonstrated by the fact that, in the 1990s, the government was only able to complete $ percent of its annual investment Portfolio (Republic of Kenya, 2003). Stalled public projects were common in nearly all

major towns, some in their advanced stage. In addition, debt service continued to "crowd out" other essential expenditures from the budget. Consequently, public expenditures, net of debt repayment and interest payments, declined from 23 percent of GDP in 1990 to less than 20 percent in 2002 (Republic of Kenya, 2002).

In the end of 2007 and early 2008 there was post election violence due to the disputed general elections. This affected the economy as farmers were displaced from their farms, factories and other businesses were closed during this period. Tourism was also adversely affected by the violence as tourism hubs (Coast and Rift Valley) were greatly hit. In the year 2008 the economy grew by only 1.6 percent. After signing of the national accord coalition government was establishment, this strained the government recourses as it is quite large comprising of 43 ministries.

For these reasons among others, the resources available to the government have been inadequate to sustain existing productive capacity. As the current government struggles to implement its pre-election pledges, it faces the daunting challenge of restructuring spending to accommodate citizen preferences without sacrificing important policy objectives.

1.5 Composition of Expenditure by Function

In the early post-independence years, Kenya recognized the importance of investment in economic infrastructure. During the period 1970-79, the government committed over a third (36.4 per cent) of its total expenditure to developing the infrastructure, nearly half of which was directed at physical infrastructure (transport and communication), followed by
agriculture. This ratio dropped to an average of 21.8 percent in the 1980s (Republic of Kenya, 2002). The downward trend continued and, by the end of the second half of the 1990s, it hit the single digit level.

Expenditure on transport and communication stood at an average of 13.0 percent during the period 1971-79. During this period, a sharp reduction in the allocation to this sub-sector from 17.8 percent high in 1978 to 8.4 percent in 1979 is evident and was never recovered. In the early 1980s, there was another marked decline, coinciding with the overall decline in capital. As of the period 1996-2002, the share of expenditure on this sub-sector was a meager 3.9 percent. This has led to a dilapidated road network; inadequate and run down railway network and; low teledensity that characterizes the transport sector. Inefficiencies in this sector directly translate into higher transport costs and reduced competitiveness while, at the same time, seriously undermining the attractiveness of the country as an investment destination. In the fifth quarter (2003-2007) the allocation to the sector increased to 5.28 percent and in 2008 increased to a high of 8.87 percent. This period saw an increase in infrastructure development for example road and road bypass construction in the country, expansion of major airports and the laying of the fibre optic which connects the country to the rest of the world.

Public spending in agriculture, the mainstay of the Kenyan economy, averaged 10.4 percent during the period 1971-7$. This average dropped marginally to 9.2 percent in the 1980s (Republic of Kenya, 2002). A monumental decline in public spending on this sector was witnessed during the first half of the 1990s, having dropped to an average of 3.8
percent. As of the period 1996-2002 and 2003-2007, public allocation stood at 3.3 percent and 2.8 percent of total central government spending respectively. In 2008 expenditure in this sector increased to 3.7 percent which saw the revival of irrigation projects, provision of subsidized fertilizers and supply of free seeds by the government. The upshot of this declining has been a matching steady decline in productivity of the sector in terms of export earnings, food security, and employment creation. The situation has further been exacerbated after liberalization of the economy by lack of capacity by the private sector to take over functions previously performed by the government. Overall, the sectoral contribution by agriculture in GDP has seen a decline from 36.6 percent in 1964-73 to 24.5 percent in 1996-2000 (Republic of Kenya, 2002).

It is widely acknowledged that successful poverty reduction entails public investment in the social sector, particularly on basic health and education. This means that while the overall proportion of expenditure on either of these two sectors can be useful indicators of how a society cares about its poor, maximum equity and efficiency gains depend on biased intra-sectoral allocations in favour of primary sub-sectors.

In the absence of readily available intra-sectoral allocations time series data for our disposal, we will below limit our analysis to the sectoral level.

The proportion of expenditure going to education has been fairly stable at around 19 percent during the period under Review. The only major deviation observed was in the Period 1990-95, which saw the average lower to 15.0 percent. Despite, the huge share of Public resources going towards the education sector, these allocations have not kept pace
with increased needs to cater for a rapidly growing school-aged population. To bridge the financing gap, cost sharing was introduced in public schools. This has made a significant proportion of children from poor households miss out on receiving the benefits from public spending in education. In addition, the transition rate from primary to secondary levels of education remains low, at 40 percent as of 2002. Since education improves the recipient's ability to exploit opportunities which, in turn, improve his welfare, cost sharing has resulted in a widening of income inequality. Following the introduction of free and compulsory primary education in 2002, expenditure in this category rose to an average of 21.1 percent in the fifth quarter (2003-2007) and 19.6 percent in 2008 (Republic of Kenya, 2009).

In the period 1971-79, the health sector consumed an annual average of 6.9 percent of total public spending. This ratio declined to 5.8 percent in the 1980s and 3.9 percent in 1990-95. It, however, rose slightly in 1996-2000 to 4.9 percent. There was a slight decline in 2003-2007 to 4.7 percent. On balance, the sector can be said to have witnessed only a modest decline during the period under review. On the other hand, major indicators of health reveal a remarkable improvement in the post independence era for Kenya. Beginning 1990 however, the gains were reversed. Infant mortality for example rose from 66 in 1989 to 71 in 1999 (Republic of Kenya, 2002). The HIV and AIDS scourge prevailing in the country further compounds the situation.

In general for two main reasons. One; available statistics indicate that the most affected is
the 15-49 age bracket. This age group happens to comprise the current and the immediate next economically productive segment of the population. Two; positive status comes along with other multiplier effects like the need for care resulting in loss of time and, financial and material resources.

General public administration comprises public order and safety, general administration and external affairs. The overall upward movement of the expenditures in this category has to a large extent been influenced by spending on general administration. Spending on public order and safely recorded sustained declines, falling from 6.8 percent in 1971-79 to 5.4 percent and 4.0 percent during 1980-89 and 1990-95, respectively. It however reverted back to the 5.4 percent during the period 1996-2002 and on the other hand, public expenditure on general administration rose from 7.0 percent in 1971-79 to 8.5 percent in 1980s. During the period 1990-95, the average public spending on this function dropped marginally to 8.0 percent, but was followed by a rise, up to 12.3 percent during 1996-2002. The average share of spending on external affairs has barely changed during the entire period. The only exception was a more than double increase from 1.3 percent in 1990-95 to 2.8 percent in 1996-2002.

Public spending on general public administration averaged 14.9 percent, 15.1 percent, 13.3 percent, 20.6 percent and 15.8 percent during the five phases, respectively. In 2008 the expenditure on this expenditure was 11.2 percent (Republic of Kenya,2009). The unport of these mixed changea in intra-sectoral allocation is a bloated 'core civil service' an understaffed, ill equipped internal security force. This has seriously impaired the
capacity of the police to deal with increases in both frequency and sophistication of reported crimes.

Peace and tranquility as essential pre-conditions for investment and growth cannot be over-emphasized. However, as noted earlier, the ongoing reforms in the sector have gone a long way in correcting the imbalance through the reduction of the 'core civil service' and recruitment of more police officers.

Finally, military expenditure accounted for 9.2 percent and 9.3 percent during the periods 1970-79 and 1980-89, respectively. The allocation to this category drastically reduced to average 4.7 percent and 4.8 percent and 5.6 percent of total central government expenditure in the third, fourth and fifth phase of our review period, respectively.

1.6 The Statement of the Problem

The effects of fiscal policy on the long-run rate of growth have been extensively researched within endogenous growth theory (Barro, 1990; Shioji, 2001). The vast majority of these studies are cross-country (Pradhan, 1996; Stern, 2002) or panel data studies (Sesay, 1999; Were, 2001; Stiglitz, 2000). Though these studies have their merits they severely suffer from the heterogeneity of the underlying data set (Easterly, 2003). Countries differ from each other in many respects. The resulting econometric problem is coined parameter heterogeneity (Barro, 1990). As a result, it has so far proved quite difficult to empirically show a robust long-term correlation between government variables and economic growth (Easterly, 2003). To avoid parameter heterogeneity, time series studies have been recommended by Shioji (2001). This study therefore seeks to fill in the apparent gap in literature by using time series data set.

Public expenditure may exert an effect on the economic growth rate through the positive
externality (Barro, 1990). Due to tightening budget constraints non growth-enhancing expenditures may crowd out outlays that possibly boost economic growth (Easterly, 2003). This would certainly cause budget crowding out. Therefore, the issue of which government expenditures can foster permanent movements in economic growth rates becomes increasingly important. This study therefore focused on analyzing the impact of the composition of public expenditure on economic growth because this aspect could be crucial for long-run economic policy.

1.7 The Research Questions

i. How is government expenditure on education related to economic growth in Kenya?

ii. Does government expenditure on defence increase economic growth in Kenya?

iii. What is the relationship between government expenditure on health on economic growth in Kenya?

iv. Does government expenditure on agriculture accelerate economic growth in Kenya?

v. What is the relationship between government expenditure on transport and communication infrastructure and economic growth in Kenya?

1.8 The Objective of the Study

The broad objective of the study was to investigate the relationships between the composition of government expenditure and the economic growth. The specific objectives of the research are:

To investigate the relationship between expenditure on education and economic growth in Kenya
ii. To find out the relationship between defense expenditure by the government and economic growth in Kenya

iii. To investigate the relationship between government expenditure on health and the economic growth in Kenya

iv. To investigate the relationship between government expenditure on agriculture and economic growth in Kenya.

v. To find out the relationship between government expenditure on transport and communication infrastructure and economic growth in Kenya.

1.9 The Significance of the Study

This study attempts to investigate the effect of public expenditure composition on economic growth in Kenya. It also seeks to assess the significance of input mix (between capital and current expenditures) at the aggregate and sectoral levels. An important question we address in this research is whether the recent shift in views regarding the size of government and composition of expenditure finds support in the data. The research sought to enhance and complement existing literature in relative.

The study provides information which could be useful in policy formulation in the ongoing realignment of government functions in Kenya. Based on the findings of the quantitative impact of each variable in explaining growth, existing policy positions will be reviewed and/or appropriate ones will be recommended for Kenya.

The above issue may be viewed in the light of the concern expressed in Pradhan 1996 that intersectoral allocations are based largely on intuitive judgments. According to this
view, most developing countries seldom carry out systematic approach to their budget process. The consequences are that public resource allocation decisions rarely reflect sound economic policies.

1.10 The Scope of the Study

This study is organized into five chapters. In chapter one, we will discuss the background to this study from a global perspective with special reference to the OECD countries and COMESA member states. We will also discuss briefly the fiscal scenario in Kenya, the objectives, significance and the scope of the study. The rest of this project is organized as follows.

Chapter two reviews some of the literature (theoretical and empirical) that have matched or influenced the changing perspectives on the role of government. The empirical investigation begins in chapter three by way of notes on the methodology adapted in this study. The empirical findings are discussed in chapter four. Finally, chapter five concludes the study with summary, conclusions, policy implications, limitations of the study and areas for further research.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

In this chapter, a review of the theoretical and empirical literature on composition of public expenditure and economic growth. The chapter is divided into three parts. The first section discussed the theoretical literature relevant to this study; the second part review empirical literature while the final part collated the findings obtained from the two sections, and come-up with a synthesis of the literature.

2.1 Theoretical Literature Review

The earliest literature on public expenditure, Wagner's (1883) works remains among the most cited, at least in academic circles on public expenditure. According to Demirbas (1999), Wagner's work offered a model based on historical evidence that could help in the determination of public expenditure in which growth of public spending was a natural consequence of economic growth. In other words, he viewed public expenditure as a behavioral variable that merely positively responds to the dictates of a growing economy. The views were later formulated into law, now referred to as "Wagner's Law," which states that there is a tendency for government expenditure to grow relative to national output, i.e.

\[ \text{and; } \frac{A}{Y} = G \]
Where $G$ is the aggregate level of public expenditure and $Y$ is aggregate output.

On the other hand, the neoclassical school of thought holds that a temporary rise in government expenditure induce excess demand pressures, resulting in a rise of real interest rates and, hence, output. The magnitude of demand pressure likely to arise is further argued to be greater for public investment (as it induces an increase in the rate of return to private capital) compared to an equal amount of public consumption. The alternative view maintains that taxes necessary to finance government expenditures distort private incentives, reduce efficient allocation of resources, and, hence, reduce the level of output. On the longer term, permanent expansions of public expenditure are thought of as eroding private wealth (Aschauer, (1989a and 1989b). The Solow (1956) growth model predicts that steady state growth is determined by exogenous factors the dynamics of population and of technological progress. Conventional wisdom has therefore been that public expenditure and fiscal policy in general can only affect the rate of growth of the economy during its transition to the steady state. In the mid 1980s, failure of per capital incomes to converge across countries and time (as predicted by the Solow model) gave a new impetus to research on long-run economic growth. Following a diverse body of literature trying to explain this failure, the idea of endogenous growth models evolved (Mankiw et al., 1992).

According to Sturm (1998), the impact of public capital on economic growth has been investigated along a number of routes. First is the production function approach. Under this approach, public expenditure ($G$) is typically assumed to enter the production function in two ways. First, it may be viewed as influencing the multifactor productivity
(A). Second, it can directly enter the production as a third input (Sturm 1998).

\[ Y = A(G)/(K,L,G) \]  \hspace{1cm} 2.1

Where \( Y \) is real aggregate output of the private sector, \( K \) is aggregate fixed private capital and \( L \) is labour input. Whether one or both effects are identified depends on the production function assumed. The most common practice is to include it as a separate input. But as Sturm (1998) points out, it makes no difference whether public expenditure is included as a third input or as influencing technological progress factor in the commonly assumed Cobb-Douglas function. This effectively presumes that the public expenditure should be paid according to its marginal productivity whose costs can be appropriated.

A second route is the behavioral approach, where the economic agents are assumed to maximize profits (or minimize costs). Taking the price \( p \) of inputs as given, the agent chooses the amount of private inputs \( x \) to produce a given level of output \( y \). The objective function is constrained to take into account the firm's operating conditions in the form of technology level \( A \) and the amount of public infrastructure available \( G \). The public capital enters the production function and, hence, the profits (cost) function as an \( \text{unpaid} \) fixed input as given below.,

\[ \text{max} \quad p^y \quad \text{v.s.t} \quad y = f(x,A,G) \]  \hspace{1cm} 2.2

\[ \text{min} \sum p_i x_i \quad \text{v.s.t} \quad y = f(x,A,G) \]  \hspace{1cm} 2.3
where \( p \) is the price of output.

This approach is highly flexible and a proper estimation usually requires a data set rich in information content. Both the production function and behavioral approaches are derived from economic theory that predetermines the causal directions, an issue that forms the backbone of the criticisms directed to these approaches.

Consequently, a third, primarily data based approach (Sturm (1998) labels it VAR approach), has recently emerged. This approach attempts to address some of the problems associated with the above two methods through the deployment of a battery of tests on the data. Despite its success in overcoming such problems, its major shortcoming is that it fails to completely reveal the underlying production process and therefore derives elasticity estimates through impulse response functions. As a matter of likeness, the analytical methodology employed in this thesis fits in this category.

These new vintage of growth models predict that fiscal policy will confer both temporary (on the level of output) and permanent (on the steady-state growth rate) effects on growth. It is therefore possible to construct a short-run dynamic model which incorporates the long-run equilibrium relationship between public spending and economic growth. This cannot be said of the neoclassical models where, in long-run equilibrium, the steady state rate of growth is completely independent of public policies.

In the recent past, endogenous growth models have begun to be subjected to further scrutiny. Easterly and Rebelo (1993), note that the strength of fiscal effects in
endogenous growth models differ widely from model to model, depending heavily on the elasticity of labor supply and on aspects of the technology to accumulate human capital. Easterly (2003) reapprais es further the early literature on endogenous growth models. He finds that the association between growth and policies is not robust to different estimation procedures. Furthermore, his study echoes the conclusion found in the literature on institutional economics in the sense that he finds the policies to be driven by institutional variables. According to this, economic development, to a large extent, depends on institutions which, in turn, are permanent mirrors of geographical and historical conditions. He thus concludes that the effects of national policies on economic growth were over-emphasized. In our empirical section, we will formally attempt to capture the permanent and temporary effects of public expenditure through cointegration test and dynamic Error Correction Model (ECM), respectively.

2.3 Empirical Literature Review

Landau (1983) and Kormendi and Meguire (1985) are among the early empirical works that investigated the impact of public expenditure on economic growth in the long-run. Landau (1983) considered government along with a long list of variables that potentially influences growth, which he subsequently narrowed down in a stepwise regression procedure. He examined the impact of 'key fiscal' variables on economic growth in 104 countries. He classified these countries into four groups (high income, medium income, bottom and third world) based on 'per capita incomes. His finding was that, except for the bottom income group, increase in government consumption was associated with lower growth rates. In their study, Kormendi and Meguire (1985) carried out what they termed
endogenous growth models differ widely from model to model, depending heavily on the
elasticity of labor supply and on aspects of the technology to accumulate human capital.
Easterly (2003) reappraises further the early literature on endogenous growth models. He
finds that the association between growth and policies is not robust to different estimation
procedures. Furthermore, his study echoes the conclusion found in the literature on
institutional economics in the sense that he finds the policies to be driven by institutional
variables. According to this, economic development, to a large extent, depends on
institutions which, in turn, are permanent mirrors of geographical and historical
conditions. He thus concludes that the effects of national policies on economic growth
were over-emphasized. In our empirical section, we will formally attempt to capture the
permanent and temporary effects of public expenditure through cointegration test and
dynamic Error Correction Model (ECM), respectively.

2.3 Empirical Literature Review

Landau (1983) and Kormendi and Meguire (1985) are among the early empirical works
that investigated the impact of public expenditure on economic growth in the long-run.
Landau (1983) considered government along with a long list of variables that potentially
influences growth, which he subsequently narrowed down in a stepwise regression
procedure. He examined the impact of 'key fiscal' variables on economic growth in 104
countries. He classified these countries into four groups (high income, medium income,
bottom and third world) based on 'per capita incomes. His finding was that, except for the
bottom income group, increase in government consumption was associated with lower
growth rates. In their study, Kormendi and Meguire (1985) carried out what they termed
an 'exploratory' empirical analysis on a set of six macroeconomic hypotheses that may affect economic growth across a sample of forty-seven countries. Among the hypotheses they considered was the 'supply side' hypothesis concerning the effects of government spending. From OLS regressions, they found no evidence in support of the 'supply side' hypothesis. On the contrary, their estimated coefficient was positive, albeit insignificant.

Aschauer (1989) investigated the impact of stock and government spending variables on economic growth using national data from the United States. His finding was that core infrastructure (comprising of streets and highways, electrical and gas facilities, mass transit, water and sewage systems) had a strong and positive explanatory power for productivity. Other infrastructure (office buildings, police and fire stations, courthouses, garages and passenger terminals) and hospitals had a positive and statistically significant impact on growth, while educational buildings had a negative, albeit insignificant impact on growth.

Building on the work of Aschauer, Holtz-Eakin (1992), used state level data for 48 US states which he further aggregated into 8 regional aggregate data. The data set consisted of output, labor, private capital, and state and local government capital. Besides reinforcing Aschauer's findings, he arrives at an interesting finding: that aggregating the data from state-level to regional level does not permit one to capture spillovers of any substantial magnitude. Easterly and Rebelo (1993), from a pooled time-series cross-section of data, concluded that only transport and communication" and' general government investment are robustly correlated with growth. Elsewhere, Easterly, W.,
Kremer, M., Pritchett and Summers L.H., (1993) presents statistical evidence suggesting that long-run growth of an economy is driven by either favorable shocks or worldwide technological progress. In contrast, country characteristics and policies determine relative income levels.

According to Gramlich (1994), the current bubble of academic literature and debate on public spending in general and public capital expenditure in particular was triggered by Aschauer in a series of papers (Aschauer (1989a, 1989b, 1989c)). Gramlich would write "after years of ignoring the issue [i.e. neglect of public capital in US], economists led by Aschauer did finally find it [the neglect of infrastructure as the cause of the US productivity slowdown], giving some more professional gloss..." Indeed, his work was followed by a tremendous amount of interest by economists and politicians alike, with subsequent research extending to other sectors of public expenditures.

While the size of government can be a matter of public choice, its composition is open to policy debate (Devarajan et al., 1996). Besides the aggregate level of expenditure, different functions can affect the economy differently. Unfortunately, empirical evidence that is currently available to shed light on the link between the composition of public expenditure and growth is sparse. The bulk of the literature that seeks to investigate the impact of public spending is devoted to aggregate spending and/or infrastructure investments. Furthermore, most of this literature has primarily focused on developed countries (Sturm, 2001).

In the government spending literature on developing countries, Devarajan et al., (1996)
present a comprehensive study on the impact of the composition of public expenditure on economic growth. They use pooled data from 43 developing countries. Using the method of ordinary least squares (OLS), the dependent variable in their regression is a five-year moving average of real GDP growth. The independent variables included: total current expenditure; total capital expenditure; total share of public expenditure devoted to defense, education, health, transport and communication (as a proxy for economic infrastructure) as per the IMF’s Government Financial Statistics (GFS) classification of expenditure. Other independent variables included total central government expenditure (to control for the share of total government expenditure in GDP) and; external shocks and a premium for black market (to control for policy environment distortions).

The findings of their studies were that the total expenditure has a positive and significant impact on growth the public expenditure on health has a negative but statistically insignificant impact on growth, expenditure on economic infrastructure has a negative and statistically significant impact on growth and expenditure on defense has a negative and statistically significant impact on growth.

The empirical work implicitly on the impact of public spending in Kenya is limited, if not non-existent. Nonetheless, Were (2001) included public investment and proxied for investment in human capital development by primary school enrollment rate in her study on the impact of external debt on economic growth and investment in Kenya. She found current public investment and investment in human development to be growth enhancing, but that past (lagged) public investment had a negative impact on growth.
Shioji (2001) examined the role of public capital via an income convergence equation. This, he argues, allows him to capture the entire dynamic path of the effects of public capital in the estimates of the model's parameters. He uses state level data for 48 US states and 47 prefectures' data for Japan. He then uses five different estimation techniques. He finds that aggregate capital is unproductive in the US, but productive in Japan. However, the disparity narrows down when disaggregated data on public capital is used.

Kweka and Morrissey (1999) examined the impact of government expenditure in a growth accounting model framework. Their model assumes two factors of production: capital (K) and Labor (L), and two sectors: government and private, each possessing the two factors of production. In addition, they include other potential determinants of growth, namely exports and foreign capital, as regressors. Using a sample time series data on Tanzania for 32 years, they disaggregated government expenditure data into expenditure on physical (productive) investment, consumption and human capital investment along the lines of Barro (1990). Applying cointegration and error correction methods, they observed that increased expenditure on physical investment is associated with lower growth while consumption expenditure relates negatively to growth. They found a positive link between growth and private consumption (itself a measure of growth) however.

Dar and Amir Khalkhali (2002) employed a random effects model to explore the extent to which the size of government explains (via its effect on total factor productivity) the difference in economic growth of 19 OECD countries over the period 1970-1999. From
the pooled sample, the government size had a negative and statistically significant impact on economic growth. In the country specific estimate of their model, all countries conformed to the aggregate results; with the exception of USA, Norway and Sweden, — whose coefficients were statistically insignificant. This finding is also reflected in lower productivity of capital input in countries with large governments.

2.4 Overview of Literature

The preceding review indicates that theoretical foundation of modeling public expenditures is still evolving. In a setting where government spending is assumed to be unproductive and taxes distortionary, then neoclassical growth theory concludes higher government spending generally leads to a lower long-run per capita income. In contrast, the prediction in an endogenous growth setting is that higher government spending will in the long-run give rise to higher incomes.

At the empirical level, no consistent evidence for a relationship between the composition of public expenditure and growth exists. Much of the empirical literature focuses on developed countries and the results seem to differ by both the categorization of public expenditures and the analytical method used. Though not uncontested, the general view is that expenditure on physical infrastructure and human development can enhance growth.
CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter presents the model specification and methodology employed to examine the relationship between the composition of public expenditure and economic growth in Kenya. A theoretical framework for the study is first outlined, and then followed by the specification of the empirical model. The variables used in the study are explained, including sources of data and diagnostic tests employed.

3.2 Theoretical Framework

The study first introduces the theoretical model by Devarajan, Swaroop and Zou (1996) that derives conditions under which a change in the composition of public expenditure leads to a higher steady state growth of the economy. The study highlight salient features as a theoretical foundation to interpret empirical findings.

Following Barro (1990), Deverajan et al. (1996) assumes two types of government expenditure; productive and unproductive. Their model distinguishes between the productive and unproductive expenditures by detailing how a shift in the mix between the two alters the economy's long-term growth rate. They assume the aggregate production function has three arguments: private capital stock, \(k\), and two types of government spending, \(g_1\) and \(g_2\). The production function exhibits constant elasticity of substitution (CES), formally expressed as:
\[ y = f(k, g, \delta_2) = \{a k^{-\gamma} + \delta_3 g^2 + y g^\delta \} \]

Where

\[ a > 0, \quad \delta > 0, \quad \gamma > 0, \quad a + \delta + \gamma = 1, \quad \delta > -1. \]

As in Barro (1990), the government is assumed to finance its expenditure by levying a flat-rate income tax, \( r \),

\[ ry = Si + g_2 \]

The share, \( \phi(0 < \phi < 1) \) of total government expenditure which goes towards \( g \), is given by

\[ \phi Ty \quad \text{and} \quad g_2 = (1 - \phi) ry. \]

Taking the government's decisions on \( i \) and \( \delta \) as given, the representative agent chooses consumption, \( c \), and capital, \( k \), to maximize his welfare

\[ u = \int_0^\infty u(c) e^{-\rho t} dt, \]

Subject to

\[ k = (-r)y - c, \]

Where \( p \) is the rate of time preference.

56
Omitting the details of their analysis, we write the relationship between the steady-state growth rate, \( \Delta \), and the share of government expenditure devoted to \( g \),, \( p \) as:

\[
dk = \frac{7(1 - \alpha x)}{\alpha T^C + C} f a T^C \left\{ \frac{u(C)}{p < P_{f(UC)}} \right\} - \psi O - \alpha f - p f' - Y i - c i + w_i
\]

(3.3)

where

\[
\left\{ a \{ \frac{1}{T^C} \} \right\} - \psi \left\{ \frac{-p f - Y i - c i + w_i}{\alpha} \right\}
\]

(3.4)

Under the definition of productive expenditure as that component of public expenditure; an increase in whose share will raise steady-state growth rate of the economy, then, component \( g \), would be productive if \( \frac{d\Delta}{dp} > 0 \).

Since \( C > -1 \) then \( \frac{d\Delta}{dp} > 0 \) if

\[
\frac{d\Delta}{dp} < \frac{a}{\psi}
\]

\[
\frac{d\Delta}{dp} < \frac{a}{\psi}
\]

Where \( \psi = \frac{\partial y}{\partial p} \) is the elasticity of substitution.

This condition (for a shift in the composition to increase the growth rate) depends not just on Productivity (p and y) of the two components but also on the initial shares. Thus, a
shift in favor of an 'objectively' more productive type of expenditure

(P > y) may not raise the growth rate if the initial share (p) is 'too high'.

Assume (3 > y and define (p as the critical value above which an increase in the share of expenditure going to g.will increase the growth rate. That is,

1 - 0

This will imply that

\[
\frac{dd}{de} = (1-<p) \ln \frac{p}{r}
\]

so that \( \frac{df}{dd} > 0 \) since 6 > y

As the two types of government expenditure become more and more substitutable, o increases. The intuition is that the more substitutable the two types of expenditure, the more likely it will be that an increase in the share going to the one with the higher coefficient will increase the growth rate. Conversely, when the substitution elasticity is low, increasing the amount going to g,may not increase the growth rate even if the initial share is quite small (Devarajan et al., 1996).

Note that the increase in the growth rate achieved by shifting towards productive expenditure can be accomplished with no change in total government expenditure.

As in Barro (1990) and Barro and Sala-i-Martin (1992), the model highlighted above
makes a distinction between transient effects (on output) and permanent effects (on the steady-state growth rate) deriving from changes in government spending. Further, it shows that for a given component of government expenditure to be productive, the sign of the exponent in the production function does not matter. Rather, it is the relationship between the coefficient (output coefficient in the Cobb-Douglas case) and the actual share on the budget that does. In addition, \( P > y \) is not sufficient to guarantee that a shift in favor of \( gj \) will increase the growth rate; it must be the case that the relative budget shares are below the relative output elasticities.

### 3.3 Model Specification

The growth models specified in this study only takes into account potential determinants of growth in Kenya. Specifically, augmented standard growth accounting model will be estimated.

\[
gpa = a_0 + P_{egsw} + P_{edu} + P_{econinfl} + P_{agri} + P_{hlth} + P_{trancom} + P_{def} \tag{3.5}
\]

The null hypothesis therefore is that, \( H_0 : \beta_t = 0 \) \( \forall t, \beta_t \neq 0 \)

Where;

- \( gpa \) = Growth per capita
- \( egsw \) = Expenditure on gas, sewerage and water
- \( econinflar \) = Inflation rate
- \( ^a gr \) = Expenditure on agriculture
- \( Nth \) = Expenditure on health
- \( trancom \) = Expenditure on transport and communication infrastructure
3.4. Definition of Variables and Measurement of Variables

Economic Growth

This is the increase in the value of goods and services produced in an economy. It is measured as the percentage rate of increase in real gross domestic product.

Current Expenditure

This is recurring spending or, in other words, spending on items that are consumed. They are items that are used up in the process of providing a good or service. In the case of the government, current expenditure would include wages and salaries and expenditure on consumables.

Capital Expenditure

It is the spending on assets. It is the purchase of items that will last and will be used time and time again in the provision of a good or service. In the case of the government, examples would be the building of a new hospital, the purchase of new computer equipment or networks, building new roads and so on.

Expenditure on Agriculture

This is share of public expenditure on agriculture in total government expenditure. It is the expenditure on research, extension services, provision of free seeds, fertilizer and other farm inputs and subsidies provided by the government to the farmers. Other spending is through infrastructure development, manufacturing, marketing and distribution of produce within the sector.
**Expenditure on Defence**

This is the ratio of expenditure in defence to total government expenditure. It is the expenditure incurred by the government to train, pay and equip the military personnel and other expenditure on peace keeping mission across the globe.

**Expenditure on Education**

It is the ratio of expenditure in education to total government expenditure. This is the expenditure incurred by the government to finance higher, tertiary and basic education through payment of the teaching and non teaching staff which takes a large percentage of the sector's budget, construction of learning infrastructure such classes, lecture halls and offices and purchase of learning equipment. Other spending goes to bursaries, loans for university students through High Education Loans Board and other government scholarships.

**Expenditure on electricity, gas, sewage and water**

This is the share of Expenditure in electricity, gas, sewage and water in total government expenditure. It is what the government spends on generation and distribution of electricity, exploration and purchase of gas, sewerage infrastructure development and provision of clean drinking water through building of dams, drilling of boreholes, treating and piping of water to homes to both urban and rural areas for both domestic and commercial use. It is measured as a percentage of the total government expenditure.

**Expenditure on Health**

This is the ratio of public expenditure on health to total government expenditure. It is what the government spends on construction of hospitals, dispensaries and health centres and equipping them with drugs and other medical equipments. Other expenses are
through training of doctors, nurses and other staff and their emoluments.

**Expenditure on Transport and Communication Infrastructure**

This is the share of public expenditure on transport and communication infrastructure in total government expenditure. This is what the government spends on roads and road bypasses construction, airport expansion, seaport improvement and the laying of fibre optic to improve connectivity with the rest of the world.
3.5 Data Type and Source

This study use annual Kenyan data for the period 1972-2009 for all the variables. The classification of the expenditure data is expressed in two main ways as defined in the government finance tables: economic and functional classifications.

The economic type expenditures are divided into current expenditures which include the purchase of goods and services, wages, salaries, interest payment and subsidies; and capital expenditures which include investments stocks, land, capital assets, and capital transfers. The functional classification of expenditure which is based on the function towards which the expenditure is directed. They are divided into six categories which are general public administration (including general administration, external affairs and, public order and safety), defense, education, health, social security and welfare which cover government services supplied to the community and households directly and. economic services which include expenditures associated with regulation and/or more efficient operation of business and include expenditures on: transportation (road, water and railway); fuel and energy services; agriculture, forestry and fishing and; mining and manufacturing.

The sources of data are the National Accounts Tables, the Government Finance Tables and the Financial Statistics Tables of Kenya, all published by the Central Bureau of Statistics (CBS) in various issues of the Statistical Abstract and the Economic Survey.

Time Series Properties of data,

The first step was to test for stationarity of the variable. Augmented Dickey - Fuller (ADF) will be used to test for stationarity of the series. The next step will be to establish whether
the non-stationarity variables were cointegrated. Differencing of variables to achieve stationary will lead to loss of long-run properties.

The concept of co-integration implies that if there is relationship between one or more non-stationary variables deviations from the long-run path is stationary. To establish this, the Engel-Granger two steps procedures will be used. This is done by generating residuals from the long-run question of non-stationarity variables, which is then tested for stationarity using ADF test.

3.7 Estimation Procedures

Our analytical methodology marks an important point of departure from the one used by Devarajan et al., (1996). In order to overcome problems associated with nonstationarity of data, causality and relational dynamics, we adapt the cointegration and Error Correction Model (ECM) approach proposed in 1987 by Robert Engle and Clive Granger (1987). Specifically, we will conduct unit root test, causality test, cointegration test and build an Error Correction Model in that order. Below, we discuss these procedures in turn.

3.7.1 Testing for Stationarity

Non-stationarity of time series data is a perennial problem in empirical analysis. To avoid proceeding to estimate a spurious regression which renders further inference meaningless, we employ the Augmented Dickey-Fuller (ADF) test to investigate stationarity (or non-stationarity) establish the order of integration. The existence of unit roots in a series indicates non-
^tionancy. The ADF test is essentially the same as the DF test, except that it allows for serial delation in the error term by including lagged changes of the independent variable as a lessor. No hard and fast rule exists as to how long the lag length should be. However, it has to
be long in order to reflect the additional dynamics that could not be captured by the DF test and also possibly to ensure that the error term is white noise—i.e. normally distributed with zero mean and a constant variance (Pindyck and Rubinfeld, 1998). Technically, the ADF test essentially involves running an OLS regression on the following general form equations:

\[ A_y = a + p_t + \gamma t^{-i} + \eta \quad \text{for levels} \]  
\[ A \Delta y = a + p_t + \gamma y^{-i} + \eta \quad \text{for first differences} \]  

Where \( a \) is a drift, \( t \) is trend, \( m \) is the number of lags and \( \eta \) is an error term. We then use the \( cp \) statistic to test the null hypothesis

\[ H_0: (a, p, y) - (a, 0, 1) \quad \text{(non-stationary)} \]

Against the alternative hypothesis

\[ H_1: \{a, p\} \quad (a, 0, 1) \quad \text{(stationary)} \]

If the null hypothesis is rejected, then the variable is stationary.

### 3.7.2 Testing for Cointegration

Cointegration is a technique used to estimate equilibrium or long-run parameters in relationships with variables in a non-stationary series. This technique enables use of the estimated long-run parameters into the estimation of the short-run equilibrium relationships.

Before testing for Cointegration, there is a need to determine the order of integration of the individual time series. According to Granger (1986) and Engel and Granger (1987), a non-
stationary time series $X_t$ is said to be integrated of order $d$ or $I(d)$ if it achieves stationarity after being differenced $d$ times. Cointegration implies that even though the series are non-stationary, there exists a linear combination that is itself stationary. Cointegration also implies that $1(1)$ variable can be estimated by OLS method to produce an OLS estimator of $p$ that is super consistent in the sense that as the sample size grows larger; the estimator of $(3)$ converges to its true value much faster. To test for cointegration, Johansen Cointegration test method was be used.

3.7.3 Granger Causality Test

The study employs the Granger (1969) causality test approach to determine the causal directions. The test for causality is also referred to as a test for exogeneity. This will determine whether growth models should be estimated using a single or simultaneous equation method. The theoretical framework in this study predicts that a change in the composition of government spending determines the level of per capita output (PCGDP). However, PCGDP may in turn help to predict government spending and thereby expose our model to simultaneity bias. Existence of a statistically significant association between government spending and economic growth in the absence of causality tests provides no insights into the direction of causality. It could be compatible with the Keynesian theory (government expenditure leads growth). Equally, it could be analogous to Wagner's Law (growth leads government expenditure), or a bi-directional causality between the two variables. Clearly, this has important ramifications about the utilization of government spending as a fiscal policy tool. Our next step, therefore, is to test for directional causation.

Eventually, a causality test of $Y$ on $X$ is tested for by estimating the linear equations (3.8) and (3.9) below, and then performing the F-test for the joint significance between the two tables which tests whether the are significantly different from zero.
Restricted regression: \( X_t = a_0 + \sum c_i 1 X_{t-i} + \varepsilon_t \) (3.8)

Unrestricted regression: \( Y_t = \beta_0 + \sum \beta_j Y_{t-j} + \sum \gamma_i X_{t-i} + \varepsilon_t \) (3.9)

Where \( \varepsilon_t \)'s, \( \beta_j \)'s and \( \gamma_i \)'s are the parameter estimates, while \( \varepsilon_t \)'s are error terms assumed to be white noise, \( m \) and \( n \) are the number of lagged values of \( X \) and \( Y \), respectively. In short, the test uses lagged values of \( X \) to explain current \( X \) and then goes further to test if the prediction of current \( X \) can be improved by use of lagged values of \( Y \). To examine whether \( X \) causes \( Y \), the above procedure is repeated with \( Y \) as the dependent variable as follows:

Restricted regression: \( Y_t = \beta_0 + \sum \beta_j Y_{t-j} + \varepsilon_t \) (3.10)

Unrestricted regression: \( Y_t = \alpha_0 + \sum \alpha_j X_{t-j} + \varepsilon_t \) (3.11)

Again, conventional F-tests are performed to ascertain the joint significance of the \( \beta_j \)'s. There are four possible outcomes when we estimate equations 3.8, 3.9, 3.10 and 3.11. First, no relationship exists between \( X \) and \( Y \) (\( X \not\Rightarrow Y \)) if \( \beta_j \)'s and \( \alpha_i \)'s are both jointly insignificant. Thus, independence of the two variables is suggested. Second, a unidirectional relationship from \( X \) to \( Y \) (\( X \Rightarrow Y \)) exists if the \( \beta_j \)'s are jointly significant, while \( \alpha_i \)'s are jointly insignificant. In such an occurrence, we say \( X \) Granger causes \( Y \). Third, a unidirectional relationship from \( Y \) to \( X \) exists if the \( \beta_j \)'s are jointly insignificant, while the \( \alpha_i \)'s are jointly significant. Thus we say \( Y \) Granger causes \( X \). Finally, a bi-directional relationship exists between \( X \) and \( Y \) (\( X \Leftrightarrow Y \)) if the \( \beta_j \)'s and \( \alpha_i \)'s are both jointly significant. Thus we say \( X \) causes \( Y \) which in turn causes \( X \)

\[^{11}\] The Error Correlation Model

Error Correction Model (ECM) has cointegrating relations built into the system such that it restricts the long-run behavior of the endogenous variable to converge to their cointegrating
Restricted regression: $X_t = a_0 + X^{TM}_t + \sum_{i=1}^a iX_t - i + \epsilon_t$ \hspace{1cm} (3.8)

Unrestricted regression: $Y_t = p_0 + \sum_{i=1}^m p^X_t - i + \sum_{i=1}^n y./Kt + \epsilon_t$ \hspace{1cm} (3.9)

Where $\alpha$'s ($3$'s and $y$ 's are the parameter estimates, while $\epsilon$ s are error terms assumed to be white noise, $m$ and $n$ are the number of lagged values of $X$ and $Y$, respectively. In short, the test uses lagged values of $X$ to explain current $X$ and then goes further to test if the prediction of current $X$ can be improved by use of lagged values of $Y$. To examine whether $X$ causes $Y$, the above procedure is repeated with $Y$ as the dependent variable as follows:

Restricted regression: $Y_t = \gamma_0 + \sum_{i=1}^m \gamma^X_t Y_t - i + \epsilon_t$ \hspace{1cm} (3.10)

Unrestricted regression: $Y_t = \delta_0 + \sum_{i=1}^n \delta^X_t - i + \sum_{i=1}^a \delta^Y_t - i + \epsilon_t$ \hspace{1cm} (3.11)

Again, conventional F-tests are performed to ascertain the joint significance of the $\alpha$ 's. There are four possible outcomes when we estimate equations 3.8, 3.9, 3.10 and 3.11. First, no relationship exists between $X$ and $Y$ ($X \not* Y$) if them's and $a$ 's are both jointly insignificant. Thus, independence of the two variables is suggested. Second, a unidirectional relationship from $X$ to $Y$ ($X \rightarrow Y$) exists if the $a$ 's are jointly significant, while them's are jointly insignificant. In such an occurrence, we say $X$ Granger causes $Y$. Third, a unidirectional relationship from $Y$ to $X$ exists if thecr's are jointly insignificant, while theA.'s are jointly significant. Thus we say $Y$ Granger causes $X$. Finally, a bi-directional relationship exists between $y$V and $Y$ ($Y \leftrightarrow Y$) if fe$^\wedge$'s and crar both jointly significant. Thus we say $X$ causes $Y$ which in turn causes $X$

**The Error Correlation Model**

The Error Correction Model (ECM) has cointegrating relations built into the system such that it e long-run behavior of the endogenous variable to converge to their cointegrating
relationship, while allowing for short-term adjustment dynamics (Were, 2001). This approach presents several advantages. First, it incorporates both the short and long-run effects. Second, all terms in the ECM are stationary. This implies that results from OLS and their associated statistical inferences are valid given the existence of cointegration. Third, the ECM is bound to cointegrate in that, given the existence of cointegration, there must exist an ECM. Conversely, an ECM generates cointegrated series (Morrissey and Kweka, 1999). The error correction term (cointegrating term) gradually corrects the deviations from long-run equilibrium through the short-run adjustments. The dynamic versions of the long-run relationship of equations (3.5) and (3.6) can be specified as error correction models of the forms below.

\[
\text{DLPCGDP}_t = \beta_0 + \beta_1 \text{DLRPINV}_{t-1} + X^\top \delta_1 \text{DFRPINV}_{t,j} + \epsilon_t = \alpha + \text{DEXSHOCK}_i + \epsilon_t
\]

This approach presents several advantages:

1. It incorporates both the short and long-run effects.
2. All terms in the ECM are stationary, ensuring the validity of OLS results and their statistical inferences.
3. The ECM is bound to cointegrate, given the existence of cointegration, and vice versa.

The error correction term (cointegrating term) gradually corrects deviations from long-run equilibrium through short-run adjustments. Dynamic versions of the long-run relationship of equations (3.5) and (3.6) can be specified as error correction models of the forms below.

\[
\text{DLPCGDP}_t = \beta_0 + X^\top \delta_1 \text{DLRPINV}_{t-1} + X^\top \delta_2 \text{DFRPINV}_{t,j} + \epsilon_t = \alpha + \text{DEXSHOCK}_i + \epsilon_t
\]

\[
\text{DLPCGDP}_t = \beta_0 + \beta_1 \text{DLRPINV}_{t-1} + X^\top \delta_1 \text{DFRPINV}_{t,j} + \epsilon_t = \alpha + \text{DEXSHOCK}_i + \epsilon_t
\]

where \( \beta_0 < 0 \) and \( \beta_8 < 0 \).

The "D" before the variable symbol represents the first difference operator; \( \delta_1 \) and \( \delta_2 \) are error term coefficients.*

The "S" normally distributed with zero mean and constant variance; \( \text{m}_{\epsilon} \ldots \ldots \text{w}_{\epsilon} \) and \( \ldots \ldots \text{w}_{\epsilon} \) are error term lengths and need not be the same (i.e., not necessarily identical); and \( \epsilon_t \) is the error term calculated as
\[ ECT, = PCGDP, - PCGDP; \]

Where \( PCGDP, \) is the actual per capita GDP in time period \( t, \) and \( PCGDP, \) is the Fitted value of \( PCGDP, \) estimated from equations (1 and 2). Equivalently, the error Correction term \( (ECT,_,) \) is given by a linear combination of the residuals at a single lag and reflects the temporal status of the long-run relationship in the system.

The study proceeded to search for the most parsimonious model from an over parameterized model through the testing down (general-to-specific) strategy. Diagnostic tests that was performed include Breusch-Godfrey LM test (for autocorrelation), Lagrange Multiplier (LM) test (to test for autoregressive conditional heteroskedasticity), Jacque-Bera test for normality and Ramsey's RESET test (to test for omitted variables, incorrect functional form and correlation between \( X \) and the error terms).

3.8 Data Analysis

The study addressed five objectives. The first one was to investigate the relationship between expenditure on education and economic growth in Kenya, to investigate the relationship between government expenditure on health and the economic growth in Kenya, to investigate the relationship between government expenditure on agriculture and economic growth in Kenya and to find out the relationship between government expenditure on transport and communication \^{fr}astructure and economic growth in Kenya. This was done by use of multivariate regression \^{alysis, Cointegration and granger causality tests.
CHAPTER FOUR

EMPERICAL RESULTS AND INTERPPRETATION

4.1 Introduction

This chapter presents the set of data used in the study and empirical results based on the empirical model developed in the previous chapter. Data transformation was done before estimation and time series properties of the data determined using Augmented Dickey Fuller (ADF) tests. Non stationary series in the data were made stationary by differencing. Cointegration was established using the johansen Cointegration test methods.

4.2 Stationarity Tests Results

When time series data is non stationary and used for analysis it may give spurious results because estimates obtained from such data will possess non constant mean and variance. Because this study used time series data, it was important to establish the stationarity of the data or what order they are integrated to make sure that the results obtained are not spurious. In this regard Augmented Dickey Fuller (ADF) was used to test for unit roots. The unit roots results of the variable in the model are reported in both Appendix A-1 and A-2. As shown in Appendix A-1 the results of the unit root show that variables were non stationary at levels. The tests established that the variables are stationary after differencing once which implies that they are integrated of order 1 as indicated in Appendix A-2.

"2Cointegration Test.
Likelihood Ratio indicates five cointegrating equation(s) at 5% significance level. From the analysis in Appendix B-1, can infer that there are five cointegrating equations, given that the likelihood ratio is greater than the critical value at 5 percent significance level and therefore there is a linear combination among the variables.

After the cointegration test, the Granger Causality Test was conducted. The findings are as shown in Table 4.1 below:

**Table 4.1: Granger Causality Test**

<table>
<thead>
<tr>
<th>Granger Causality Tests</th>
<th>F-Statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU does not Granger Cause GPA</td>
<td>0.06385</td>
<td>0.93827</td>
</tr>
<tr>
<td>GPA does not Granger Cause EDU</td>
<td>1.18831</td>
<td>0.03184</td>
</tr>
</tbody>
</table>

Based on the Probability values reported in the table, the hypothesis that Education does not Granger Cause Growth cannot be rejected, but the hypothesis that Growth does not Granger cause Education can be rejected. Therefore, it appears that Granger causality runs one way, from Growth to Education but not the other way.

**4.3 Diagnostic Test Results**

The following diagnostic tests were performed on the model to evaluate the validity of the model. They include Jarque bera test for normality, LM auto correlation test, ARCH (Autoregressive conditional heteroskedasticity) to detect heteroskedasticity. The results are presented in graph C-1 and table C-2 in the appendix.
4.3.1 Normality Test

Under the null hypothesis of a normal distribution, the Jarque-Bera statistic is distributed as $x^2$ with 2 degrees of freedom. The reported Probability is the probability that a Jarque-Bera statistic exceeds (in absolute value) the observed value under the null, thus a small probability value leads to the rejection of the null hypothesis of a normal distribution. As shown in the graph Appendix C-1, the value Jarque-Bera (1.52) is greater than that of the given probability (0.47) then the series are normally distributed.

4.3.2 Serial Correlation and Arch Test

Unlike the Durbin-Watson statistic for AR(1) errors, the LM test may be used to test for higher order ARMA errors, and is applicable whether or not there are lagged dependent variables. The null hypothesis of the LM test is that there is no serial correlation. The test regression used to carry out the test is reported below the statistics. The statistic labeled "Obs*R-squared" is the LM test statistic for the null hypothesis of no serial correlation. The probability value (0.057) indicates the absence of serial correlation in the residuals at five percent significance level.

The statistic labeled "Obs*R-squared" is also the arch test statistic for the null hypothesis of autoregressive conditional heteroskedasticity (ARCH) in the residuals. The probability value (0.66) indicates that there is no heteroskedasticity in the residuals at five percent significance level. Both tests results are summarized in table C-2 in the Appendix.
4.4 Results and Interpretations

Table 4.2: Regression Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>t-Statistic</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expenditure on Gas, Sewerage and Water</td>
<td>0.48</td>
<td>5.63</td>
<td>0.00</td>
</tr>
<tr>
<td>Expenditure on Education</td>
<td>0.04</td>
<td>1.27</td>
<td>0.21</td>
</tr>
<tr>
<td>Inflation</td>
<td>-0.07</td>
<td>-0.67</td>
<td>0.50</td>
</tr>
<tr>
<td>Expenditure on Agriculture</td>
<td>0.16</td>
<td>4.29</td>
<td>0.00</td>
</tr>
<tr>
<td>Expenditure Health</td>
<td>0.20</td>
<td>2.12</td>
<td>0.01</td>
</tr>
<tr>
<td>Expenditure Transport and Communication</td>
<td>0.46</td>
<td>7.30</td>
<td>0.00</td>
</tr>
<tr>
<td>Constant Term</td>
<td>0.16</td>
<td>2.56</td>
<td>0.02</td>
</tr>
<tr>
<td>ERR(-1)</td>
<td>-0.54</td>
<td>-2.77</td>
<td>0.01</td>
</tr>
<tr>
<td>Expenditure on Defense</td>
<td>0.33</td>
<td>0.69</td>
<td>0.51</td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>2.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-statistic</td>
<td>4.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prob (F-statistic)</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The regression had an adjusted $R^2$ of 0.57. This means that expenditure on health, transport and communication, defense, agriculture; health and education explain 57 percent of the variations in economic growth in Kenya. The F-value of 4.49 with a probability of 0.00 at 5% significance level is significant indicating there is linear relationship between inflation, expenditure on health, transport and communication, agriculture, education, gas water and sewerage and economic growth. The coefficient of the error term gives the speed of the adjustment of the model. The following is a discussion of each variable with regard to sign, significance and possible policy implications.

4.4.1 Government Expenditure on Transport and Communication Infrastructure

The total expenditure on transport and communication infrastructure was statistically significant shown by a t-ratio of 7.3. The coefficient of this variable is positive suggesting that one unit
increase in expenditure on transport and communication infrastructure yields 0.46 unit increases in Kenya's economic growth. With good transport and communication infrastructure the cost of doing business will be low and this makes the country attractive to investors and makes the country competitive in the region.

The results showed that an increase in the share of public expenditures in infrastructure for strategic sectors, particularly transportation, is productive and necessary for Kenya. Demand-led growth models stress that investment is essential for economic growth and is able to generate expansions in productive capacity in order to avoid supply bottlenecks. Indeed, the potential for long-run economic growth is significantly lower without an increase in public infrastructure expenditures. An increase in infrastructure expenditures reduces production costs for the firms and, consequently, stimulates investment, productivity and economic growth. This creates a favorable environment for private investment and for production at competitive levels or what is known as crowding-in effect. That is to say, public investment has the potential to stimulate private investment in the country. This positive effect between expenditure and economic growth finds support in the study by Aschauer (1989).

4.4.2 Government Expenditure on Electricity, Gas, Sewage and Water

The total expenditure on electricity gas and water had a positive coefficient suggesting that a unit increase in these services will increase economic growth by 0.48 units. This variable was measured as a share of expenditure in electricity, gas, sewage and water to total government expenditure. It is what the government Spends on generation and distribution of electricity, exploration and purchase of gas, sewerage infrastructure, development and provision of clean drinking water through building of dams, drilling of boreholes, treating and piping of water to
homes to both urban and rural areas for both domestic and commercial use. The positive coefficient can be explained by the fact that the availability of basic necessities leads to better living standards which are measures of economic development.

### 4.4.3 Government Expenditure on Health

There is a positive relationship between expenditure on health care and economic growth in Kenya. With a t-ratio of 2.12 it implies that the coefficient of the health variable is statistically significant. Public expenditure on health results to a healthy population and both economic growth and development is achieved through a healthy population. The evidence of positive effect agrees with the results obtained by Diamond (1989).

There are several ways that a healthy population can contribute to economic growth. One healthier individual could reasonably be expected to produce more per hour worked. A healthier labour force could also be expected to be more flexible and adaptable to changes for example changes in job tasks, in the organization of labour. Still more physically and mentally active individuals could also make a better and more efficient use of technology, machinery or equipment. Secondly, good health reduces the number of days an individual spends sick, which consequently results in an increase in the number of healthy days available for either work or leisure. But health also influences the decision to supply labour through its impact on wages, Preferences and expected life horizon. If wages are linked to productivity, and healthier workers are more productive, health improvements are expected to increase wages and thus the incentives to increase labour supply.

#### 4.4 Government Expenditure on Education

The expenditure on education had a positive coefficient of 0.44 and a t-ratio of 1.28 implying
that though positively correlated to economic growth, the expenditure is statistically insignificant. This can mean that the impact of what is spent on education by the government is not immediate but takes sometime before these educated people get to the workforce.

The absence of a statistically significant relation between education and growth could be a result of the limited opportunities for the educated worker to get a job in dynamic, competitive, and private sector-led sectors in the economy. The lack of such opportunities or of others in fairly efficient public sector corporations reduces the probability that higher-educated labor will develop new technologies or new productive activities that make the engine for economic growth. Government employment is a poor substitute for such activities, as productivity in government jobs tends to be low. For both reasons, poor allocation of human capital weakens the contribution of investment in education to economic growth. This hypothesis is validated by a number of studies. According to Pritchett (1996), if a developing country does not have a productive structure to be able to integrate the most qualified people, the macroeconomic output of education strongly decreases. The absence of a statistically significant relation between education and economic growth may also be a function of the distribution of education; the argument is that the impact of education on productivity will be low if only a small proportion of the population has a high level of education while the majority is illiterate.

4-4.5 Government Expenditure on Agriculture

The total expenditure on agriculture was among the most important variables influencing economic growth as shown by a t-ratio of 4.29. The coefficient of this variable is positive suggesting that one unit increase in use of inputs yields 0.16 units increase in the economic growth. Kenya being an agricultural based country, it is evident that investing in the sector such
as the expenditure on research, extension services, provision of free seeds, fertilizer and other farm inputs and giving subsidies to the farmers fertilizers is very important in the country's economy.

The role of agriculture in the overall economic growth in Kenya can thus not be ignored. This is because agriculture is recognized as one of the pillars necessary to support economic recovery. The country's socio-economic and political development is heavily dependent on agriculture and the sector's growth is indeed a catalyst for growth in other sectors. Contrary to early classical thinking, which viewed agriculture as a low-productivity, traditional sector that primarily contributed to development of a nation by providing food and employment, increase in real incomes in rural areas provides market opportunities for urban industrial and service development, through increased derived demand for urban-manufactured goods and services. This feedback linkage is critical for development of the economy as a whole, especially where export opportunities are not sufficient to allow urban industries to achieve competitive efficiency in foreign markets through economies of scale. This study concurs with the study of Msuya (2007) which examined the impact of government expenditure on agricultural productivity and found out a positive impact of government expenditure on smallholder productivity and efficiency.

4.4.6 Government Expenditure on Defense

The amount spent on defense by the government had a t-ratio of 0.67. This means that the variable is statistically insignificant. The expenditure incurred by the government to train, pay equip the military personnel, and other expenditure on peace-keeping missions across the globe though does not spur any economic growth to the country. By spending on military the
government reduces the civilian GDP which reduces growth proportionately. Secondly, defense spending also adversely affects growth because the government sector in general exhibits negligible rates of measurable productivity increases. Finally growth can suffer because increased military spending takes over resources that could otherwise been employed as civilian investment and hence contribute to economic growth. The results in the report concur with the existing literature where the effect on defense has been found to be neutral Ram (1986).

4.4.7 Inflation

The relationship between inflation and economic growth is negative as indicated by the negative coefficient. Though negative, inflation is statistically insignificant as indicated by a t-ratio of 0.67. The negative relationship between inflation and economic growth is consistent with economic theory since an increase in prices of commodities reduces the purchasing power parity amongst people and lowering the growth in business in return.
CHAPTER FIVE
SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

5.1 Summary
The main objective of this study was to investigate the relationship of public expenditure composition and economic growth in Kenya. To achieve the objective of the study, time series data for the period 1972 to 2009 was collected for the various macroeconomic variables. Unit root tests were conducted to test the stationarity level of the data which was found to be integrated of order one. The data was also tested for Cointegration and revealed long run relationship between economic growth and its determinants.

From theory, public spending is widely seen as having an important role in supporting economic growth. Public spending is a key variable that influences the sustainability of public finances via effects on fiscal balances and government debt. On the other hand, a lower level of spending implies that fewer revenues are needed to achieve balanced budgets, which means that lower taxes can be levied, therefore contributing to stimulate growth and employment.

Using the collected data, the study found out that government expenditure on water, gas, health, agriculture and expenditure on transport and communication are positively related to economic growth and are statistically significant. Government spending on education and defense however do not spur any changes to economic growth. The rate of inflation is negatively related to economic growth as high prices reduce the purchasing power parity of the citizens hindering trade which is a key component to growth. In this study $R^2$ was explaining 57 percent of the variations in the determination of economic growth.
5.2 Conclusion

Overall, the analysis shows that on average government expenditure and potential output are linked by a long-run relation such that government spending grows roughly in proportion with potential output. However, the net impact of potential growth on the future stream of government budget balances depends also on other factors like the political will, the efficiency and also on prioritizing on the key sectors of the economy. The results suggest that, on average, increased rates of potential growth would leave the share of government expenditure on potential output unaffected, but the impact would differ quite considerably across sectors. In order to realize the expected economic growth in the country the performance will largely depends on the efficiency of scaled-up expenditure.

From the study, it is evident that the composition of government expenditure spurs economic growth. It is however worth noting the key sectors like transport and communication, health and agriculture are the major drivers of economic growth. This is based on the simple fact that Kenya is a developing country and any investment in infrastructure will bring in many economic benefits to the country. Kenya also being an agricultural based country means that the majority of its citizens depend on agriculture both directly and indirectly and any developments in the sector will benefit so many people.

5.3 Policy Implications

On the basis of the study findings the following policy recommendations arose:

The survey showed that though government expenditure on education is positively related to economic growth it does not spur any significant change to growth. Based on this, investing in
more and better-distributed education in the labor force will help create conditions that could lead to higher productivity and higher economic growth. It is also necessary to adopt policies that lead to the creation of diversified, dynamic, and competitive sectors capable of absorbing the more educated labor force to translate human capital into higher economic growth. The evidence supports the view that countries that combine both do better on average than those that do one without the other.

Given the reason that the expansion of education is higher than that of job growth in Kenya and there are relatively few job opportunities outside government for secondary and university graduates, the expansion of education has produced a large surplus of graduates, high unemployment, and long waits for government jobs. This means that rates of return to higher education are probably not rising. There is need for the government to ensure a conducive and attractive environment for private investors who can absorb the large number of unemployed but educated people. Kenyans also need to take advantage of the new integrated East Africa Community and look outside our borders for employment opportunities.

On health while an increased expenditure on improving health might be justified purely on the grounds of their impact on labor productivity, quite apart from the direct effect of improved health on welfare. This supports the case for investments in health as a form of human capital, however the study is not able to distinguish between the effects of different types of health investments that affect different groups within the population.

**High** investment ratios do not necessarily lead to rapid economic growth; the quality of investment, its productivity, existence of appropriate policy, political, and social infrastructure and all determinants of the effectiveness of these investments. Private investment is often seen as
the engine that drives a country's economy, while public investment provides the necessary infrastructure. The two however are related, as public investment may crowd in (if it provides the infrastructure to support the private sector) or crowd out (by increasing costs of borrowing or cherry-picking the best investment opportunities) private investment. Public investment itself affects growth either directly, via its productivity, or indirectly via its effect on private investment. Public investment in human capital (health and education), law and order, research and development, and social and economic infrastructure leads to creation of positive externalities which in turn improve the productivity of private investment. As a result of this relationship between private and public investment the government should come up with policies that brings a balance between the two.

5.4 Suggestions for Further Research

An area that seems unclear and worthy of further research is the opportunity costs faced by the government and other social planners as a measure against societal benefit in the implementation of the policies suggested herein. It can be conjectured that constraints such as cultural, environmental, and the non development of the manufacturing sectors of the economy will reduce the business activities within the country as foreign countries with well developed manufacturing sectors and economies of scale will have lower and more competitive prices and quality (of goods and services alike) imposed on the economy thereby hindering the growth of local industries and increasing unemployment which invariably implies an increase on dependence on public welfare and an increase in unproductive government expenditure and of course a reduction in economic growth. A noteworthy question will be one which asks how the individual can have preferences and activities ranked and ordered in such a manner than socially
optimum outcomes capable of increasing per capita GDP may be attained in spite of these constraints
REFERENCES


Investigation, NBER Working Paper No. 4499, National Bureau of Economic


Creation, Nairobi Government Printers.

Printers.

Nairobi: Government Printers.


Publishing companies Ltd.

Sessay, A. (1999). Budget Deficits, Exchange Rate Dynamics and Inflation: The Case of Sierra

Economic Growth* 6, 205-277.

339.*


## APPENDICES

### Appendix A-Unit Root Tests

Table A-1: Unit roots ADF Stationary Test at Level

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>LAGS</th>
<th>ADF</th>
<th>CRITICAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Public Administration</td>
<td>1</td>
<td>2.444036</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Defense</td>
<td>1</td>
<td>-1.858746</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
<td>-2.387489</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Health</td>
<td>1</td>
<td>-1.404266</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Social security housing and community welfare</td>
<td>1</td>
<td>-1.741603</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Economic Inflation</td>
<td>1</td>
<td>-1.339117</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1</td>
<td>-1.318626</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Mining, Manufacturing and construction</td>
<td>1</td>
<td>-1.799330</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Electricit, Sewerage, Gas and Water.</td>
<td>1</td>
<td>-1.605986</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
<tr>
<td>Transport and Communication</td>
<td>1</td>
<td>-1.949646</td>
<td>1% -3.6228</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9446</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6105</td>
</tr>
</tbody>
</table>
# Table A-.2: ADF Stationary Results after First Difference

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>LAGS</th>
<th>ADF</th>
<th>CRITICAL VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Public Administration</td>
<td>1</td>
<td>-4.519873</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Defense</td>
<td>1</td>
<td>-4.806237</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Education</td>
<td>1</td>
<td>-5.491850</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Health</td>
<td>1</td>
<td>-4.750087</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Social security housing and community welfare</td>
<td>1</td>
<td>-5.456805</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Economic Inflation</td>
<td>1</td>
<td>-6.306537</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Agriculture</td>
<td>1</td>
<td>5.738545</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Mining, Manufacturing and construction</td>
<td>1</td>
<td>-5.217031</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Electricity, Sewerage, Gas and Water.</td>
<td>1</td>
<td>-4.686613</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
<tr>
<td>Transport and Communication</td>
<td>1</td>
<td>4.775968</td>
<td>1% -3.6289</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5% -2.9472</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10% -2.6118</td>
</tr>
</tbody>
</table>
Appendix B: Cointegration Tests

Table B: Cointegration test results

<table>
<thead>
<tr>
<th>Eigen value</th>
<th>Likelihood ratio</th>
<th>5% Critical value</th>
<th>Hypothesized No. of (CE)s</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.939770</td>
<td>406.5159</td>
<td>233.13</td>
<td>None **</td>
</tr>
<tr>
<td>0.927053</td>
<td>305.3708</td>
<td>192.89</td>
<td>At most 1 **</td>
</tr>
<tr>
<td>0.818660</td>
<td>211.1219</td>
<td>156.00</td>
<td>At most 2 **</td>
</tr>
<tr>
<td>0.760754</td>
<td>149.6560</td>
<td>124.24</td>
<td>At most 3 **</td>
</tr>
<tr>
<td>0.614523</td>
<td>98.16654</td>
<td>94.15</td>
<td>At most 4</td>
</tr>
<tr>
<td>0.487471</td>
<td>63.84873</td>
<td>68.52</td>
<td>At most 5</td>
</tr>
<tr>
<td>0.406732</td>
<td>39.78641</td>
<td>47.21</td>
<td>At most 7</td>
</tr>
<tr>
<td>0.239911</td>
<td>20.99050</td>
<td>29.68</td>
<td>At most 7</td>
</tr>
<tr>
<td>0.196562</td>
<td>11.11501</td>
<td>15.41</td>
<td>At most 8</td>
</tr>
<tr>
<td>0.085973</td>
<td>3.236217</td>
<td>3.76</td>
<td>At most 9</td>
</tr>
</tbody>
</table>

*(***) denotes rejection of the hypothesis at 5% (1%) significance level
Appendix C: Residue Tests

Graph C-.1: Normality test

Series: Residuals
Sample 1974 2009
Observations 36

Mean 1.36E-16
Median -0.532725
Maximum 9211256
Minimum -8795653
Std. Dev. 3.761235
Skewness 0.447163
Kurtosis 3.461524
Jarque-Bera 1.519237
Probability 0.467845

Table C-2: LM-test and ARCH test results

<table>
<thead>
<tr>
<th>Test</th>
<th>Obs*R-squared</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>LM-test</td>
<td>9.379064</td>
<td>0.052292</td>
</tr>
<tr>
<td>ARCH Test:</td>
<td>5.440851</td>
<td>0.065847</td>
</tr>
</tbody>
</table>
## Appendix I: Variables Used in Various Analysis and Estimations

<table>
<thead>
<tr>
<th>YEAR</th>
<th>PCGDP</th>
<th>GE%</th>
<th>CUR</th>
<th>CAP</th>
<th>RPINV/RGDP</th>
<th>P DEBT/GE</th>
<th>INFL</th>
<th>WER</th>
<th>EXSHOCK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>21814</td>
<td>31.4</td>
<td>72.6</td>
<td>27#</td>
<td>14.0</td>
<td>9.4</td>
<td>6.9</td>
<td>65.2</td>
<td>-7.6</td>
</tr>
<tr>
<td>1973</td>
<td>26943</td>
<td>30.6</td>
<td>70.1</td>
<td>29.9</td>
<td>10.5</td>
<td>8.7</td>
<td>3.9</td>
<td>65.0</td>
<td>-9.2</td>
</tr>
<tr>
<td>1974</td>
<td>27309</td>
<td>31.1</td>
<td>71.4</td>
<td>28.6</td>
<td>9.7</td>
<td>8.7</td>
<td>13.9</td>
<td>68.0</td>
<td>-5.4</td>
</tr>
<tr>
<td>1975</td>
<td>27491</td>
<td>33.6</td>
<td>70.8</td>
<td>29.2</td>
<td>15.5</td>
<td>8.0</td>
<td>15.0</td>
<td>62.4</td>
<td>-24.3</td>
</tr>
<tr>
<td>1976</td>
<td>26805</td>
<td>36.2</td>
<td>67.5</td>
<td>32.5</td>
<td>19.4</td>
<td>8.4</td>
<td>10.7</td>
<td>57.8</td>
<td>-47.9</td>
</tr>
<tr>
<td>1977</td>
<td>28227</td>
<td>39.2</td>
<td>71.3</td>
<td>28.7</td>
<td>13.3</td>
<td>9.1</td>
<td>8.7</td>
<td>68.0</td>
<td>68.1</td>
</tr>
<tr>
<td>1978</td>
<td>29654</td>
<td>34.4</td>
<td>66.3</td>
<td>33.7</td>
<td>16.7</td>
<td>17.3</td>
<td>16.3</td>
<td>71.2</td>
<td>5.0</td>
</tr>
<tr>
<td>1979</td>
<td>30517</td>
<td>39.0</td>
<td>68.4</td>
<td>31.6</td>
<td>27.7</td>
<td>13.6</td>
<td>12.3</td>
<td>71.2</td>
<td>-9.9</td>
</tr>
<tr>
<td>1980</td>
<td>30822</td>
<td>39.5</td>
<td>70.3</td>
<td>29.7</td>
<td>24.9</td>
<td>10.1</td>
<td>8.4</td>
<td>73.2</td>
<td>-22.4</td>
</tr>
<tr>
<td>1981</td>
<td>30664</td>
<td>43.6</td>
<td>70.9</td>
<td>29.1</td>
<td>23.6'</td>
<td>17.0</td>
<td>12.8</td>
<td>78.8</td>
<td>72.0</td>
</tr>
<tr>
<td>1982</td>
<td>31425</td>
<td>32.0</td>
<td>70.9</td>
<td>29.1</td>
<td>21.6</td>
<td>12.2</td>
<td>12.6</td>
<td>90.6</td>
<td>-8.4</td>
</tr>
<tr>
<td>1983</td>
<td>30923</td>
<td>34.8</td>
<td>73.8</td>
<td>26.2</td>
<td>21.2</td>
<td>15.5</td>
<td>22.3</td>
<td>100.0</td>
<td>-21.1</td>
</tr>
<tr>
<td>1984</td>
<td>31632</td>
<td>31.2</td>
<td>86.7</td>
<td>13.3</td>
<td>11.2</td>
<td>22.5</td>
<td>14.5</td>
<td>99.2</td>
<td>-7.3</td>
</tr>
<tr>
<td>1985</td>
<td>30751</td>
<td>34.3</td>
<td>78.8</td>
<td>21.2</td>
<td>11.1</td>
<td>25.0</td>
<td>9.1</td>
<td>97.2</td>
<td>-7.9</td>
</tr>
<tr>
<td>1986</td>
<td>31173</td>
<td>32.3</td>
<td>81.0</td>
<td>19.0</td>
<td>11.0</td>
<td>26.8</td>
<td>10.7</td>
<td>120.4</td>
<td>0.4</td>
</tr>
<tr>
<td>1987</td>
<td>31755</td>
<td>35.1</td>
<td>77.6</td>
<td>22.4</td>
<td>11.1</td>
<td>23.9</td>
<td>5.7</td>
<td>136.7</td>
<td>6.6</td>
</tr>
<tr>
<td>1988</td>
<td>32143</td>
<td>33.5</td>
<td>82.2</td>
<td>17.8</td>
<td>12.2</td>
<td>25.0</td>
<td>7.1</td>
<td>165.3</td>
<td>-6.2</td>
</tr>
<tr>
<td>1989</td>
<td>32649</td>
<td>41.0</td>
<td>80.1</td>
<td>19.9</td>
<td>11.6</td>
<td>31.1</td>
<td>10.7</td>
<td>177.6</td>
<td>-17.7</td>
</tr>
<tr>
<td>1990</td>
<td>35813</td>
<td>40.9</td>
<td>76.5</td>
<td>23.5</td>
<td>10.7</td>
<td>27.2</td>
<td>10.5</td>
<td>199.0</td>
<td>-22.0</td>
</tr>
<tr>
<td>Year</td>
<td>Value1</td>
<td>Value2</td>
<td>Value3</td>
<td>Value4</td>
<td>Value5</td>
<td>Value6</td>
<td>Value7</td>
<td>Value8</td>
<td>Value9</td>
</tr>
<tr>
<td>------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>1991</td>
<td>36002</td>
<td>47.6</td>
<td>73.6</td>
<td>26.4</td>
<td>9.4</td>
<td>33.1</td>
<td>15.8</td>
<td>243.6</td>
<td>-29.0</td>
</tr>
<tr>
<td>1992</td>
<td>35675</td>
<td>43.7</td>
<td>80.6</td>
<td>19.4</td>
<td>8.7</td>
<td>40.3</td>
<td>19.6</td>
<td>282.6</td>
<td>-36.1</td>
</tr>
<tr>
<td>1993</td>
<td>35675</td>
<td>45.9</td>
<td>86.0</td>
<td>14.0</td>
<td>8.9</td>
<td>50.5</td>
<td>27.3</td>
<td>314.6</td>
<td>-157.1</td>
</tr>
<tr>
<td>1994</td>
<td>33648</td>
<td>54.0</td>
<td>88.6</td>
<td>11.4</td>
<td>9.0</td>
<td>57.7</td>
<td>46.0</td>
<td>600.0</td>
<td>-39.0</td>
</tr>
<tr>
<td>1995</td>
<td>33523</td>
<td>41.3</td>
<td>84.2</td>
<td>15.8</td>
<td>9.3</td>
<td>40.4</td>
<td>28.8</td>
<td>419.8</td>
<td>-262.6</td>
</tr>
<tr>
<td>1996</td>
<td>35207</td>
<td>39.4</td>
<td>85.7</td>
<td>14.3</td>
<td>12.3</td>
<td>37.7</td>
<td>1.6</td>
<td>551.6</td>
<td>81.3</td>
</tr>
<tr>
<td>1997</td>
<td>35366</td>
<td>40.9</td>
<td>85.4</td>
<td>14.6</td>
<td>11.9</td>
<td>32.1</td>
<td>9.0</td>
<td>510.7</td>
<td>-185.0</td>
</tr>
<tr>
<td>1998</td>
<td>33868</td>
<td>58.8</td>
<td>92.6</td>
<td>7.4</td>
<td>11.4</td>
<td>56.4</td>
<td>11.2</td>
<td>527.2</td>
<td>-47.6</td>
</tr>
<tr>
<td>1999</td>
<td>33631</td>
<td>40.9</td>
<td>91.7</td>
<td>8.3</td>
<td>11.5</td>
<td>40.4</td>
<td>6.6</td>
<td>542.9</td>
<td>-64.1</td>
</tr>
<tr>
<td>2000</td>
<td>33412</td>
<td>35.4</td>
<td>91.3</td>
<td>8.7</td>
<td>10.8</td>
<td>34.9</td>
<td>5.8</td>
<td>607.2</td>
<td>-222.1</td>
</tr>
<tr>
<td>2001</td>
<td>32449</td>
<td>39.4</td>
<td>89.0</td>
<td>11.0</td>
<td>10.4</td>
<td>29.6</td>
<td>10.0</td>
<td>594.2</td>
<td>-185.5</td>
</tr>
<tr>
<td>2002</td>
<td>32199</td>
<td>39.8</td>
<td>92.2</td>
<td>7.8</td>
<td>10.5</td>
<td>25.9</td>
<td>5.8</td>
<td>570.6</td>
<td>-144.8</td>
</tr>
<tr>
<td>2003</td>
<td>31828</td>
<td>30.0</td>
<td>85.8</td>
<td>14.2</td>
<td>10.4</td>
<td>29.2</td>
<td>2.0</td>
<td>622.5</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>31825</td>
<td>33.1</td>
<td>85.5</td>
<td>14.5</td>
<td>14.3</td>
<td>30.4</td>
<td>9.8</td>
<td>664.02</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>32463</td>
<td>29.8</td>
<td>89.4</td>
<td>10.6</td>
<td>13.8</td>
<td>28.5</td>
<td>11.6</td>
<td>754.24</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>33441</td>
<td>30.6</td>
<td>85.6</td>
<td>14.4</td>
<td>14.5</td>
<td>24.8</td>
<td>10.3</td>
<td>623.71</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>34570</td>
<td>31.4</td>
<td>79.1</td>
<td>20.9</td>
<td>13.8</td>
<td>25.7</td>
<td>14.5</td>
<td>639.61</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>36000</td>
<td>36.0</td>
<td>75.6</td>
<td>24.4</td>
<td>12.8</td>
<td>20.7</td>
<td>9.8</td>
<td>604.01</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>35611</td>
<td>36.8</td>
<td>73.2</td>
<td>26.8</td>
<td>13.7</td>
<td>19.2</td>
<td>26.2</td>
<td>712.85</td>
<td></td>
</tr>
</tbody>
</table>

Source: KNBS (Various issues of Statistical Abstract and Economic Survey)
## Appendix D contd

<table>
<thead>
<tr>
<th>YEAR</th>
<th>GPA</th>
<th>DEF</th>
<th>EDU</th>
<th>HLTH</th>
<th>SSHCW</th>
<th>ECON</th>
<th>AGR</th>
<th>MMC</th>
<th>EGSW</th>
<th>TRAN</th>
<th>COM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1972</td>
<td>5.7</td>
<td>18.7</td>
<td>6.8</td>
<td>~~~</td>
<td>35.5</td>
<td>9.5</td>
<td>8.1</td>
<td>2.3</td>
<td>TOP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1973</td>
<td>13.8</td>
<td>5.9</td>
<td>20.0</td>
<td>6.3</td>
<td>8.8</td>
<td>36.2</td>
<td>8.8</td>
<td>8.3</td>
<td>2.6</td>
<td>14.4</td>
<td></td>
</tr>
<tr>
<td>1974</td>
<td>13.0</td>
<td>6.6</td>
<td>20.3</td>
<td>6.1</td>
<td>9.3</td>
<td>37.6</td>
<td>10.5</td>
<td>8.2</td>
<td>3.0</td>
<td>13.4</td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>11.9</td>
<td>6.3</td>
<td>20.5</td>
<td>6.7</td>
<td>8.2</td>
<td>36.4</td>
<td>10.8</td>
<td>7.9</td>
<td>2.6</td>
<td>13.2</td>
<td></td>
</tr>
<tr>
<td>1976</td>
<td>11.5</td>
<td>5.5</td>
<td>16.5</td>
<td>6.4</td>
<td>8.7</td>
<td>37.8</td>
<td>10.1</td>
<td>11.6</td>
<td>2.7</td>
<td>11.6</td>
<td></td>
</tr>
<tr>
<td>1977</td>
<td>20.0</td>
<td>9.5</td>
<td>18.6</td>
<td>6.7</td>
<td>8.3</td>
<td>34.6</td>
<td>9.9</td>
<td>8.2</td>
<td>3.2</td>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>1978</td>
<td>11.4</td>
<td>7.3</td>
<td>19.9</td>
<td>7.2</td>
<td>13.8</td>
<td>38.8</td>
<td>11.8</td>
<td>9.6</td>
<td>2.1</td>
<td>13.1</td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>20.5</td>
<td>21.8</td>
<td>22.5</td>
<td>8.9</td>
<td>4.5</td>
<td>44.8</td>
<td>13.4</td>
<td>3.1</td>
<td>7.8</td>
<td>17.5</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>16.3</td>
<td>14.3</td>
<td>17.5</td>
<td>6.9</td>
<td>3.7</td>
<td>25.6</td>
<td>8.6</td>
<td>2.6</td>
<td>4.3</td>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>1981</td>
<td>23.5</td>
<td>12.9</td>
<td>25.3</td>
<td>9.4</td>
<td>5.2'</td>
<td>38.4</td>
<td>15.6</td>
<td>5.0</td>
<td>5.9</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>16.9</td>
<td>9.2</td>
<td>18.1</td>
<td>6.7</td>
<td>3.7</td>
<td>27.6</td>
<td>11.2</td>
<td>3.6</td>
<td>4.2</td>
<td>6.8</td>
<td></td>
</tr>
<tr>
<td>1983</td>
<td>14.2</td>
<td>11.0</td>
<td>16.6</td>
<td>6.0</td>
<td>3.3</td>
<td>24.0</td>
<td>8.7</td>
<td>2.5</td>
<td>3.7</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>13.0</td>
<td>11.3</td>
<td>17.7</td>
<td>5.9</td>
<td>3.9</td>
<td>21.7</td>
<td>7.5</td>
<td>2.9</td>
<td>3.6</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>14.0</td>
<td>7.4</td>
<td>17.1</td>
<td>5.4</td>
<td>3.9</td>
<td>21.1</td>
<td>9.3</td>
<td>3.2</td>
<td>2.4</td>
<td>4.6</td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>12.7</td>
<td>7.8</td>
<td>20.2</td>
<td>5.7</td>
<td>3.9</td>
<td>19.1</td>
<td>9.1</td>
<td>2.2</td>
<td>2.6</td>
<td>4.1</td>
<td></td>
</tr>
<tr>
<td>1987</td>
<td>15.5</td>
<td>8.1</td>
<td>19.2</td>
<td>5.3</td>
<td>4.7</td>
<td>20.9</td>
<td>11.4</td>
<td>2.1</td>
<td>3.0</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>1988</td>
<td>14.0</td>
<td>11.1</td>
<td>20.8</td>
<td>5.4</td>
<td>4.3</td>
<td>19.0</td>
<td>11.3</td>
<td>1.9</td>
<td>2.3</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>1989</td>
<td>12.8</td>
<td>6.5</td>
<td>16.2</td>
<td>4.5</td>
<td>4.2</td>
<td>13.0</td>
<td>2.8</td>
<td>2.5</td>
<td>3.4</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>14.2</td>
<td>7.7</td>
<td>16.1</td>
<td>4.1</td>
<td>2.2</td>
<td>13-5</td>
<td>4.8</td>
<td>2.5</td>
<td>2.7</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>12.1</td>
<td>6.4</td>
<td>14.8</td>
<td>3.7</td>
<td>4.0</td>
<td>21.4</td>
<td>2.0</td>
<td>1.8</td>
<td>2.3</td>
<td>0.9</td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>12.0</td>
<td>4.7</td>
<td>14.7</td>
<td>3.9</td>
<td>2.8</td>
<td>17.3</td>
<td>1.4</td>
<td>1.4</td>
<td>2.0</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>12.2</td>
<td>4.5</td>
<td>14.1</td>
<td>3.8</td>
<td>1.7</td>
<td>11.0</td>
<td>5.5</td>
<td>1.1</td>
<td>1.2</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>1994</td>
<td>10.2</td>
<td>3.8</td>
<td>11.9</td>
<td>3.6</td>
<td>1.2</td>
<td>9.3</td>
<td>5.1</td>
<td>1.0</td>
<td>0.9</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>17.7</td>
<td>3.8</td>
<td>17.1</td>
<td>4.2</td>
<td>1.9</td>
<td>12.4</td>
<td>4.5</td>
<td>1.1</td>
<td>1.7</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>1996</td>
<td>15.7</td>
<td>4.9</td>
<td>17.3</td>
<td>4.1</td>
<td>2.8</td>
<td>13.8</td>
<td>4.2</td>
<td>0.9</td>
<td>1.8</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>19.6</td>
<td>5.7</td>
<td>18.2</td>
<td>5.8</td>
<td>2.0</td>
<td>12.9</td>
<td>3.8</td>
<td>1.2</td>
<td>1.7</td>
<td>5.5</td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>12.2</td>
<td>3.2</td>
<td>14.7</td>
<td>4.1</td>
<td>1.2</td>
<td>7.2</td>
<td>2.5</td>
<td>0.7</td>
<td>1.0</td>
<td>2.7</td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td>17.1</td>
<td>4.4</td>
<td>19.5</td>
<td>4.3</td>
<td>1.3</td>
<td>9.9</td>
<td>3.9</td>
<td>1.0</td>
<td>0.8</td>
<td>3.7</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>19.5</td>
<td>4.6</td>
<td>21.1</td>
<td>4.1</td>
<td>1.2</td>
<td>10.2</td>
<td>3.6</td>
<td>1.0</td>
<td>0.6</td>
<td>4.4</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>34.3</td>
<td>5.3</td>
<td>18.4</td>
<td>5.8</td>
<td>0.9</td>
<td>9.4</td>
<td>3.1</td>
<td>1.1</td>
<td>0.9</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>18.7</td>
<td>5.3</td>
<td>17.8</td>
<td>5.0</td>
<td>1.0</td>
<td>8.2</td>
<td>2.6</td>
<td>1.0</td>
<td>0.8</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>23.0</td>
<td>5.1</td>
<td>19.9</td>
<td>5.6</td>
<td>1.5</td>
<td>6.3</td>
<td>3.3</td>
<td>0.2</td>
<td>1.87</td>
<td>4.42</td>
<td></td>
</tr>
<tr>
<td>2004</td>
<td>11.9</td>
<td>6.2</td>
<td>20.8</td>
<td>4.1</td>
<td>5.0</td>
<td>8.2</td>
<td>3.2</td>
<td>0.2</td>
<td>2.66</td>
<td>5.48</td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td>15.4</td>
<td>5.5</td>
<td>22.3</td>
<td>4.3</td>
<td>4.9</td>
<td>5.3</td>
<td>2.7</td>
<td>2.3</td>
<td>1.53</td>
<td>3.56</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>12.5</td>
<td>5.9</td>
<td>22.2</td>
<td>5.3</td>
<td>7.1</td>
<td>6.5</td>
<td>2.3</td>
<td>0.3</td>
<td>2.15</td>
<td>4.32</td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>10.4</td>
<td>4.9</td>
<td>21.5</td>
<td>5.4</td>
<td>6.9</td>
<td>7.9</td>
<td>2.8</td>
<td>0.3</td>
<td>1.76</td>
<td>6.11</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>17.8</td>
<td>5.6</td>
<td>19.0</td>
<td>4.6</td>
<td>6.6</td>
<td>9.1</td>
<td>3.1</td>
<td>0.8</td>
<td>2.07</td>
<td>6.94</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>11.2</td>
<td>5.3</td>
<td>19.6</td>
<td>4.7</td>
<td>8.6</td>
<td>13.7</td>
<td>3.7</td>
<td>1.0</td>
<td>4.65</td>
<td>8.87</td>
<td></td>
</tr>
</tbody>
</table>

**Source:** KNBS (Various issues of Statistical Abstract and Economic Survey)